Captive Elephants under Private Ownership in India

An Investigation into the Population Status, Management and Welfare Significance

Surendra Varma, Kushal Konwar Sarma, David Abraham, S.R. Sujata, T.S. Rajeev, Nibha Namboodiri and Madhulal Valliyatte

Elephants in Captivity – CUPA/ANCF Technical Report No.15

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Contents

Preface 1
Acknowledgements 3

Section 1:
Captive Elephants under Private Ownership in India 5

Executive summary 6
Recommendations 8

Introduction 16
Objective 16
Method 16
- Welfare status of elephants 17
- The rating method 17

Results 18
- Source 19
- Shelter 19
- Water 22
- Walk 23
- Social interaction 24
- Chaining 26
- Observed behavior 28
- Work 28
- Food 30
- Reproductive status 32
- Health status and veterinary facilities 34
- Overall welfare rating for privately owned elephants 35
- Mahout (cawadi) professional experience and socio-economic status 35
- Professional experience 35
- Socio-economic status 36

Discussion 37
References 38

Section 2:
Captive Elephants under Private Ownership in Andaman 41

Executive summary 42

Introduction 44
Objective 44
Method 44
The rating method 44
Result 45
Source 45
Shelter 46
Water 47
Social interaction 47
Chaining 48
Observed behavior 49
Work 50
Food provisioning 51
Reproductive status 52
Health and veterinary care 53
Handler status 55
Discussion 57
Reference 58

Section 3:
Captive Elephants under Private Ownership in Assam 59

Executive summary 60

Introduction 63
Objective 63
Method 63
Rating method 63
Result 64
Population Status 64
Source 65
Purpose of keeping 65
Mahout change 66
Shelter 66
Water 66
Sleeping place 67

Walk 68
Social interaction 68
Chaining 69
Observed behaviour 70
Work 71
Food 72
Reproductive status 73
Health status 75
Veterinary personnel and infrastructure 76
Handler status 77
Professional experience 77
Socio-economic status 78
Overall welfare status 79
Discussion 79
Reference 80

Section 4:
Captive Elephants under Private Ownership in Bihar 83

Executive summary 84

Introduction 86
Objective 86
Method 86
The rating method 86
Results 87
Source 88
Purpose of keeping 88
Shelter 88
Water 90
Sleep 91
Walk 91
Social interaction 91
Chaining 91
Behaviour 93
Work 93
Food 94
Reproductive status 95
Health status 95

Veterinary personnel 96
Handlers' socio-economic status 97
Overall welfare status 98
Discussion 99
References 100

Section 5:
Captive Elephants under Private Ownership in Karnataka 103

Section 5a
Captive elephants of Aane-Mane Foundation 104

Executive summary 105

Introduction 107
Objective 107
Method 107
Result 108
Population status 108
Source of elephant 108
Shelter 108
Water 109
Sleep and related features 109
Walk and social interaction 110
Chaining 110
Behaviour 111
Work 112
Food provisioning 112
Reproductive status 113
Health status and veterinary care 113
Welfare status of the mahout 114
Discussion 116
References 117

Section 5b
Captive elephants of Mysore Palace 119

Executive summary 120

Introduction 122
Objective 122

Method 123
Result 123
Population status 123
Shelter 123
Water 124
Sleep and related features 124
Walk and social interaction 125
Chaining 126
Behaviour 126
Work 127
Food provisioning 128
Reproductive status 129
Health status and veterinary care 130
Welfare of the mahout 130
Discussion 133
References 134

Section 6:
Captive Elephants under Private Ownership in Kerala 137

Executive summary 138

Introduction 141
Objective 141
Method 141
The rating method 141
Results 142
Source 142
Purpose 143
Shelter 143
Water 144
Sleep 145
Walk 146
Social interaction 147
Chaining 148
Observed behaviour 150
Work 151
Food 153
Reproductive status 154
Health status 155
Veterinary personnel and infrastructure 157
Mahout/ cawadi professional experience and socio-economic status 158

Socio-economic status 160
Overall welfare status of elephants 161
Discussion 162
Reference 163

Section 7:
Captive Elephants under Private Ownership in Rajasthan 165

Executive Summary 166

Introduction 168
Objective 168
Method 168
The rating method 168
Results 169
Purpose of keeping 170
Source of elephants 171
Shelter 172
Water and related features 173
Sleep related features 174
Walk 174
Social interactions 174
Chaining 174
Behaviour 175
Work 176
Provision of food 177
Reproductive status 178
Health status 179
Veterinary care and infrastructure 181
Overall ratings 182
Discussion 185
References 187

Preface

Elephants kept under private ownership contribute a large percentage of captive elephants in India. These elephants belong to specific age-class indicating the interest of owners in commercial exploitation. Elephants under private ownership play a critical role in defining welfare status and the overall welfare of elephants in captivity. Other captive elephant management regimes, for e.g., forest camp, zoo and temple and even circus come under a structured management, have specific roles and could be held responsible for management of elephant. But elephants kept under private ownership have no structure, i.e. are individual based, have no specific management and are primarily oriented towards individuals' likes and dislikes and their knowledge levels. This aspect puts a lot of strain on the elephant. Here, the management of elephant is random, highly commercially oriented and animals are pushed to their limits to meet owners' demands.

For this investigation, 775 elephants from private owners in Andaman, Assam, Bihar, Karnataka, Kerala and Rajasthan were investigated. Although elephants from circus and category of Traveling and Begging also come under private ownership, these elephants are defined by their specific work types and life style. Privately owned elephants, irrespective of the reason for their maintenance, continue to exist in Andaman Island. Private ownership includes individuals and individuals running timber industries; three major industries in the Islands are: the Andaman Timber Industries (ATI), Jayashree Timber Products (JTP) and the Asian Woods and Polymers (AWP).

In Assam and other parts of north east India, the utilization of forest resources using all means including elephants continued till the Supreme Court of India imposed a comprehensive ban on any kind of profitable logging in the North East in 1996. This brought the entire timber industry to a complete halt, rendered the elephants jobless and without any viable income to take care of the animals. Being very expensive to maintain, most of the private owners started disposing their unemployed elephants. Some owners in Assam were compelled to let loose their domestic elephants in the wild, to turn feral. It is assumed that between 1997 and 2002, not less than 800 elephants were sold to Bihar and Kerala, Tamil Nadu or tourism fields in Rajasthan and Nepal. However, even in poverty, captive elephants kept in Assam lead a better quality of life compared to those maintained in other states in India or in other non-range countries.

As far as captive elephant welfare is concerned, the natural settings of the north-east and the farmlands of Bihar are connected. The elephants in the richly endowed natural landscape of North-east India are translocated to the unnatural settings of Bihar for economic reasons. Elephant keeping in Bihar has a long history; however, there are no specific data or details on the elephant status, management, welfare and associated aspects available.

Kerala, like Bihar sourced elephants mainly from Assam through Bihar's Sonepur Elephant mela. The private owners in this state have certain specifications regarding sex, age class and other features such as body length, height and tusk type. It is a matter of concern that the numbers of tuskers maintained in captivity in Kerala outnumber the female elephants. This results in loss of gene pool to the wild in the absence of mating and also increases availability of raw tusks for trade. Incidents of running amok and causing injury or killing of handlers or public is recorded for elephants with private owners and with temples. Incidents ascribed to these two

regimes are a cause for concern for all involved. This aspect of aggression by elephants needs further study to establish the factors causing or linked to such incidents.

Karnataka has 2 types of private owners: one who keeps elephants within the forested landscape. Their keeping may act as model for individual's role in providing near natural environment for elephants. The second type of owner keeps elephants in city limits, which attracts a lot of tourist. The only advantage for the elephants with such owners is that they are kept as a group and has some structure and management in handling the elephants.

The princely state of Rajputana was one of the richest during and even before the British Raj. The care and wealth that was expended on their royal elephants was legendary. With the abolition of the Privy Purse in 1971, these elephants became an economic burden on the depleted wealth of the Maharajahs or the kings and princes. They were given away to their mahouts or handlers, who overnight changed status from employees of the royal palaces to commercial vendors, trying to eke out a living with the elephant.

There have been no scientific investigations of the existing captive elephants, their distribution, management and the welfare status; and this investigation is the first ever attempt at a detailed investigation on the species in captivity. Efforts were made to visit every single elephant found in the Andaman Islands, and this was achieved by traveling through close or open boats, by air, foot, vehicles or whatever possible mode available, even during peak rainy days. The survey revealed that presence of some elephants and mortality data not being recorded or updated. It may be stated here that captive elephant-keeping data is not all the time the easiest information to gather or sometimes, even to access. This is because private owners view the investigation as an invasion of their privacy. This may be one of the foremost reasons that could prevent the truth to emerge on actual status of elephant-keeping in these management regimes.

Data processing was accomplished using two approaches - a rating scale developed by experts using the importance of a particular parameter for an elephant as first approach. In the second approach, welfare features or parameters were rated on a zero to ten scale with zero representing extremely unsatisfactory conditions and ten implying a satisfactory state, closer to an animal's experience in the wild. This was further sub-divided into 0 to 2.4 as reflecting bad welfare conditions, 2.5 to 4.9 as poor, 5.0 to 7.4 as moderate and the values 7.5 to 10 as satisfactory conditions.

The report aims to evaluate the existing welfare and management status of captive elephants. The document has seven sections; section one deals with overall welfare status of all the elephants kept under private ownership. Section two covers the exclusive status of captive elephants kept under private owners in Andaman Island, third section deals with elephants from Assam, fourth from Bihar, fifth from 2 different private ownership categories from Karnataka. Sixth chapter covers elephants from Kerala and the seventh from Rajasthan. The information gained through this investigation is an effort to focus on the current conditions of captive elephants in private ownership and for the first time to highlight their captive conditions onto the national and international radar along with, possible improvements and recommendations for their welfare and protection.

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Section 1:
Captive Elephants under Private Ownership in India

Executive summary

Elephants owned by private individuals and institutions contribute substantially in terms of number of elephants owned by them. This, however, has not ensured information availability on the status of elephants with private owners (individuals).

This investigation gathers information on the welfare status of elephants kept under private ownership in terms of existing captive conditions (physical and biological) and also collect information on the professional experience and socio-economic status of handlers (mahouts/cawadis) belong to this category.

Information regarding elephants and handlers was collected by direct observation and through interview of relevant personnel. This was achieved by involving teams of volunteers drawn from educational institutions/ nature clubs. A range of captive features, both physical and biological, have been observed and compared with those observed for wild elephants. Deviations from conditions in the wild have been considered to represent poor welfare. The greater the deviation, the poorer is the welfare. Deviation from the wild state for the parameters observed was rated using a scale developed by elephant experts.

Information on population demography was gathered from 775 elephants belonging to owners in seven states— Andaman, Assam, Bihar, Karnataka, Kerala, Rajasthan (Jaipur) and Tamil Nadu. Kerala contributed 66% to this sample, Rajasthan (Jaipur) 15%. The ages of 14 males and 4 females was not known. Considering both males and females together, 63% of the sampled population was made up elephants in the age group 16-40 years, followed by 25% in the age group 41-60 years. Sub-adults formed 7% and juveniles (1-5 years) 4%. The occurrence of calves and elephants older than 60 years was less than 0.5%. The ratio of males to females showed absence of female calves and female elephants aged more than 60 years for every male in the same age class. Male: Female ratio was 3:1 for both juveniles and sub-adults. This ratio was 2:1 for the age groups 16-40y and 41-60y.

Eighty four percentages of the elephants had been purchased or gifted or transferred across owners. Mean Rating (MR) for source was 1.4 as compared to an Expert Rating (ER) of 6.0 showing a deviation of 77% from prescribed norms.

Seventeen percentages were maintained in forest areas, 60% in covered type man-made shelters and 18% were tied in the open (no forest) and 30 % were exposed to natural floors (earthen/mud). MR was 3.7 with a deviation of 54% from ER.

Only 19% (n=98) elephants had access to rivers/streams, bathing place was the shelter itself for 30%, a combination of various sources (rivers/ ponds/ tanks/ taps) was available for others and 14% were bathed in pond/lake/using tap water. MR was 3.7 indicating a deviation of 54% from ER.

Ninety two percentages of elephants (n= 92) were given opportunity to walks, nature of terrain varied─ roads, forest areas and mean distance covered was 7.5kms/day in a duration of 2.4hrs. MR was 5.3 implying a deviation of 41% from ER.

Eighty six percentages of elephants were allowed interaction with other elephants; interaction opportunity was subject to work schedule/managerial decisions. Mean interaction duration was 8.6hrs and mean group size was 6.0. MR was 4.5 with a deviation of 44% from ER.

Only 11% elephants were allowed to range-free as well as chained; the rest were not allowed to range-free. Thirty five percentages of elephants were chained using spikes or were hobbled by their fore-legs and mean chaining duration was 15.8hrs. MR was 1.3 with a deviation of 84% from ER.

Ninety percentages of the elephants were used for work, work type was use in timber operations, for tourism, in festivals/functions and mean work duration was 6.4hrs. Mean maximum weight carried by elephants was 225kg and MR was 4.1 showing a deviation of 49% from ER.

Forty six percentages of elephants were allowed to forage as well given stall feed, remaining were given only stall-feed. Stall feed types were jowar/ sorghum straw, jaggery, chapatti, sugarcane, palm leaves, grass, banana, water-melon, coconut, horse-gram, banyan stem, bamboo. MR was 3.0 with a deviation of 67% from ER.

Among 14 females (for whom data was available), oestrus was reported for 11 elephants, nine females (for whom data was available) were exposed to males, two of ten females were given opportunity to breed and 0nly one elephant (of four) had given birth. MR was 4.0 indicating a deviation of 50% from ER.

Sixty three percentages of elephants were reported to have foot/leg problems; 16% had eye problems (cataract/blindness); 14% reported such instances as anemia, GI problems, Urinary problems, respiratory problems, worms, wounds and abscess was seen in 7% of the elephants. Veterinary doctor was available for all elephants and MR was 5.1 showing a deviation of 36% from ER.

Overall welfare rating for privately owned elephants was 4.0 showing a deviation of 50% from ER.

Mean age of handlers was 31.2yrs, mean experience in this profession was 15.9yrs and mean experience with most recent elephant was 4.1yrs. MR was 5.5 showing a deviation of 39% from ER. Mean annual salary was Rs.23, 304/-, mean number of children per family was 2, insurance cover was available for 20% of handlers and 54% reported alcohol consumption. MR was 3.2 with a deviation of 54% from ER.

In elephants owned by private individuals and institutions, the rating shows a deviation of 50% or more for shelter provided, water source and bath related features, chaining, work, food provisioning and reproductive status of elephants. Interestingly states like Assam and Andaman, the elephants were provided forest areas as shelter space. This was lacking for most elephants among the other states observed.

Recommendations

Existing conditions suitable for elephant keeping
Near idyllic conditions in one instance only – Aanemane Foundation, Karnataka, with comparably less suitable conditions for elephants in most of the state.

Negative conditions of elephant keeping
Absence of suitable captive environment, varying to a very high degree from the recommended, for elephants with private owners

- Heavily exploited and overworked, for logging or rented out to temples or functions
- Acquired illegally in most cases
- Multiple elephants often under a single ownership certificate
- Severe constraints of space/running water/shade/veterinary facilities
- Total isolation from con-specifics
- Brutal methods of subjugation and training
- Public and mahout safety issues
- A high percentage of animals in this regime live in a very poor environment and suffer from a lack of facilities that constitute good elephant-keeping. This group is also used for financial and commercial activities that severely compromise the animal's welfare.

Recommendations

a) As elephant keeping is primarily oriented towards commercial interests, the need for elephants to be maintained by private individuals has to be questioned in the context of the purpose for which they are maintained. Prioritizing work or exhibition of one's social status will be at a cost to the elephant's welfare status.
b) Given this, in its present form, keeping of elephants by private owners has to be improved, or some cases even stopped.
c) The elephant owners have completely poor or fragmented knowledge of the elephants' needs - social and group requirements - or training. In some cases, even though animals are not made to work, they suffer from lack of exercise and a poorly balanced diet. It is clear that untrained mahouts or labourers are used to control the animals.
d) Living conditions should include day-and-night shelters with earthen floors, bedding (specifically for those animals kept on concrete flooring in day and night shelters), water facilities for both drinking and bathing and also feeding as per diet charts. Records of births and deaths and the appointment of trained mahouts and veterinarians should be the norm for private elephant-keeping.
e) Privately owned elephants to be inspected from time to time and their environment evaluated as to the suitability of the habitat.
f) Provision of a natural environment with sufficient space, suitable substrate and varied vegetation will go a long way in alleviating the poor welfare of elephants kept by private owners. Such an environment may enable opportunities for expression of species-specific behaviours among the elephants. Such shelters may seem to be cost intensive, especially

in the background of a population that is not permanent. But, the cost benefit in terms of better welfare to the animals is priceless. Also, if keeping elephants in arid regions is stopped as is the case with some private owners, then the question of a suitable shelter will not arise.

g) Elephants are animals that need to lose heat either by loss from body surface or through the cooling action of hydration. Provision of suitable water sources with enough space for the elephant to immerse itself needs to be provided.
h) Only in cold, rainy and hot seasons one needs to have shelter management, otherwise elephants can be provided open shade based natural flooring and shelter.
i) Depending on the number of elephants maintained by each owner, elephants may have scope for interaction among themselves. However, natural conditions are not prevalent for these elephants. Hence, i) they have to be taken for regular walks (not for begging) during late evenings and early mornings, ii) to be provided with more foliage based food items, iii) good water resources to be created, iv) leaving them free or tethering them with long chains that provide scope for free movement and desired position of sleep on a natural floor.
j) As far as possible, breaking established bonds among individuals should be avoided; in instances where elephants cannot be maintained due to economic reasons, ways of maintaining established bonds among elephants with the new owners should be practiced.
k) Less dependence on chaining of the elephants has to be practiced. In a shelter where animals are allowed freedom to move, the stress imposed by chaining can be avoided with consequent improvement in the psychological and physical well-being of the animal.
l) Work has to be restricted and strictly supervised by independent agencies in order to minimize the ill-effects of over-work
m) While carrying tourists, iron howdahs are used, each weighing 100kgs. This can be a source of injury to the region of contact on the elephant's skin due to constant movement of the saddle/ poor ventilation. A recent introduction, on a trial basis, has been a howdah prepared by NGOs working with elephants (accessed online[2]). The new howdah is said to weigh only 20kgs and has a protective rubber mat underneath.
n) Tourists who use elephants for elephant safari to be informed on the ill-effects of keeping elephants in regions in which they are not found naturally and in unsuitable living conditions
o) Emphasis on the needs of elephants has to be increased by private owners: work schedule or trade should ensure maintenance of established social groups; provision for expression of species-typical behaviour such as walking, socializing, reproductive behaviours need to be ensured.
p) Existing elephants have to be confiscated if they are not provided opportunity to express species-specific behaviours in a semi-natural context and given only human-oriented work.
q) Keeping the biological and behavioural needs of the elephants in mind by the owners—the elephants have to be provided specific durations/ periods after work in order to perform species-typical activities
r) Most common problems are wounds and abscesses caused by ill-fitting gear, ankush usage and badly tended feet leading to pododermatitis and other complications. There are many poor-owners who cannot afford veterinarians or are located in distant places

s) An equally important feature is the maintenance of records: health/ service/registration for ownership of elephant, reproductive status of the elephants along with documents relating to trade/transfer of elephants has to be mandatorily maintained
t) Records should be maintained and ownership papers withheld / revoked if the animals are being commercially exploited.
u) "Gift deeds" for authenticity and source of elephant procurement by the donor to be examined
v) Elephants without ownership papers/ transport permits to be seized
w) Ownership certificates which are not authentic to be cancelled
x) Ownership needs to be monitored and reviewed and owners desirous of surrendering their elephants should return them to the State after due compensation.
y) Most of the private owners do not have ownership certificates or have fake documents- to formulate specific plan for such "owners"/elephants
z) The source of ownership documents, procurement and sale to be regularly scrutinized
aa) Enforce laws strictly to ensure better compliance
bb) Empower forest departments with financial budgets to maintain elephants confiscated from these sources
cc) Given the prestige value of maintaining elephants, it would be that much more effective if such owners were to sponsor upkeep of elephants in natural conditions, say, the sponsorship of elephants maintained by the forest department in its camps. Their invaluable contribution could be provided with sufficient publicity.
dd) A handbook on elephant management should be created with information on space, water, nutrition and exercise requirements, mahout information, etc. and should be made easily available to all private owners.
ee) All avenues of illicit sale should be closed urgently. Elephants, allegedly, are being illegally trafficked bordering countries such as Nepal and Myanmar, through forest routes. Display at Sonepur Mela of freshly caught sub adults needs to be checked by institutions like Wildlife Crime Control Bureau (WCCB) and Traffic India. There is open trade happening in the State and there are witnesses to the same in Nowgong District of the State.
ff) Regular monitoring of the movement of elephants from/to across the country where elephant under private ownership is kept
gg) Current numbers with private owners to be frozen

Mahout/Cawadi welfare

Basic facilities

Most mahouts with private owners have no proper accommodation, food and water facilities due to the negligence, ignorance or flouting of existing labour laws by both the management and the mahouts themselves. This contributes to their remaining in a very impoverished state as an underprivileged community. Most mahouts are illiterate or have primary school education. Their children lack proper education facilities. Hence, traditional elephant-keeping may continue to result in the next generation of elephant handlers remaining illiterate. Mahouts have no proper training methods and there are no proper recruitment procedures due to a lack of guidelines and interest in their profession.

a. All mahouts in service and newly recruited need to undergo training given by the Forest Department, to obtain a license from them. Periodic training programmes for Mahouts / Elephant in-charge administrative staff needs to be given.

b. Training should include proper handling of elephants, maintenance of personal hygiene, knowledge of elephant behaviour, health care and administration of first-aid measures.

c. Salary of mahouts has to be increased. Donors can be invited to donate/ participate in mahout welfare by contributing to their salary / health care / children's education.

d. Conflict can arise between mahouts and management (owners) due to various reasons. Sometimes, ego clashes give rise to conflicts where the mahout may be insulted in front of the public. Such situations have to be managed tactfully without creating resentment in the employee.

e. A minimum salary for handlers to be fixed and there should be a provision for insurance/ health cover; Enrolling handlers' children in schools to be implemented

Social Security

Mahouts suffer from extreme poverty, financial instability and constant danger to their lives. They are usually not insured by the management.

There are no benchmarks for their work and their performance is not under any scrutiny. There are neither laws nor regulations that seem to apply to them. Due to their nature of work, they are unable to organize their labour force to the level of a workers' union.

Housing, insurance and social security should be ensured.

The importance of health checks for mahouts cannot be overstated. However, rarely have any medical check-ups been conducted or fitness criteria adopted during recruitment of mahouts. This may be due to a lack of knowledge and / or a tendency on the part of owners to cut costs.

Mahouts should be registered by the forest department. They should be given a professional card after a medical check-up which should be renewed periodically and the employer should be forced to take an insurance policy for them.

Management

Owners are the link between the elephants, the mahouts and the public. Need for owner' awareness of the situation of captive elephants cannot be understated. There are many issues in maintaining elephants and mahouts that are faced by the management, be it an individual owner, temple authority, or a deputed officer in government-owned temples. General recommendations to improve management are:

Documentation

- Maintenance of SR (Service Registers) for animals and mahouts, currently unavailable due to negligence and a lack of knowledge.
- Medical histories of the animals need to be maintained mandatorily. In many cases, there is a complete lack of responsibility and interest on the part of the manager and veterinarian of an elephant-keeping facility.
- Maintenance of employee records and medical details of a mahout /cawadi and their family. This is currently unavailable due to a lack of systematic guidelines for elephant-keeping procedures.

Crisis Management

- To ascertain and judge the ability of the management to react to emergencies pertaining to the animal / mahout in day-to-day affairs. This is currently ignored due to a lack of training and knowledge.
- To evaluate medical emergencies related to an elephant. The negligence in treating early symptoms of disease, the lack of veterinary expertise and unavailability of veterinary facilities needs to be addressed.
- To establish a database of an experienced mahout pool. This database is currently unavailable. Unavailability of mahouts due to the lack of an established network is the single-most important reason for elephants suffering cruelty at the hands of inept handlers.
- It would be ideal to recommend constituting a committee for private elephants which could include a few of the owners, the veterinarian involved, an animal welfare person , a Forest Dept person and the mahout (similar to the existing structure of Institutional Ethics committee under CPCSEA). This committee could meet once in three months and look into the welfare aspects of the animal

Specific recommendations for the private elephants displayed at Sonepur mela

Sonepur Mela seems to be a hub for exchanging or selling elephants. Most elephants are bought as investment, from agents particularly from Assam, to be sold later depending on the price commanded in the open market. Monitoring of welfare conditions of these elephants is not done by any agency; rules/regulations of the Wildlife (Protection) Act, 1972 are also not followed.

It is strongly recommended that the trade in elephants (in whatever form, say as gifts/ exchange) between owners across individuals or state should be stopped in the Sonepur Mela, along with strict policing of cross-border travel of captive elephants across states.

In addition to this, elephant tusks are periodically trimmed and the same eventually ends up in national and international markets as contraband. No ivory sold is disclosed, monitored or recorded. Tusk trimming would violate ban on elephant ivory products or trade in wild elephants. The Government should get involved in:

1) Monitoring trimming of tusks by private owners
2) Giving certificates for keeping of elephants
3) Periodically checking trimmed ivory stock

Till the banning of elephant trade in Sonepur Mela is enforced, some modifications in the way elephants are displayed in the mela are necessary:

- Irrespective of the cost involved in hiring places for displaying the elephants in the mela, elephant owners may be required to hire a bigger place for displaying elephants.
- Elephants should be tied using only long chains, permitting scope for body movement and comfortable sleeping positions and a complete ban of using spike chain to be imposed. Change of location for tethering elephants needs to be introduced, and elephants should be allowed to be tied in one location only for two or three hours. The owner should be required to hire a location that gives scope for 3-4 different sites with natural shade (under tree and natural floor).
- All the elephants should be made to go for a walk early morning and late evening, this can be done with all the elephants walking together with simple decoration or name boards carrying elephant's name and ownership details
- Specific boundary between elephant and people while on display and while giving bath, by construction of boundary around them at the mela and a raised platform that divides public and elephants at the river. The platform at the river could also be used for the tourists to watch all elephants bathing
- Expose elephants to a regular pattern or protocol for bath, provide information to the mahout and owner on such aspects as not scrubbing the animal using stones, providing information on skin care and bathing materials to be used for bath
- Increase in knowledge and upgrading skills of mahouts and elephant owners are very important. Though they are in touch with the animals for long periods , there are still certain gaps that need to be addressed by proper mechanism; use of fear and punishment to control their elephants needs to reduced
- Variety of food to be given, this should include foliage, green grass and branches. Provide variety of food in different places at different heights. Allow scope for work or exercise to different parts of the body while providing food. This should also take care of the nutritional needs of the elephants and prevent contamination of food and water given to the animal.
- Equally important is the way elephants are brought to the Mela: transport should be in accordance with the rules laid down by the Ministry of Environment and Forests. There should be specific protocols of mode of travel, distance covered, food and water provided. Very importantly, the practice of bringing elephants into the Mela by foot across hundreds of kilometers within a short span of time has to be banned.
- There should be a specific ban and strict regulation of elephant coming from outside Bihar
- Monitoring of population structure of the elephants kept in the Mela to be initiated and tracking of the number of elephants, the owners who regularly came to the Mela to be started.
- The identification of elephants displayed in the mela through their physical features, photographs, microchipping to be done and comparison of the investigation of the data collected by various institutions across different years to be made.
- Obtain information from the media, such as from news paper cutting of the Mela every year, to develop a data base of elephant and their age and sex classes displayed across the years.

- Identification of the reasons for maintaining elephants of specific sex/ age needs to be done, and the actual source of elephant with each owner has to be collected. If only males are maintained, investigation of the male fathering any calves to be known.
- Monitoring the proportion of elephants sold in the Mela has to be done and the details of price expected per sale to be investigated.
- The details of amount spent on keeping elephants in the Mela per year have to be collected.

The source of new elephants brought into the Mela could be from other states endowed with a relatively high level of breeding captive population or by bringing illegal wild-caught elephants. There could be substantial number of calves and juveniles found in Assam, which becomes a source of elephants for other states. Status of captive elephants, more specifically calves and juveniles in Assam needs to be investigated. Population details of captive elephants in Assam are very important. It is important to know the percentage of males, females, calves found in Assam.

Specific recommendations for private elephants used in temple festivals in Kerala

1. Putting an end to the practice of keeping elephants by temples keeping in view the long term effects of maintaining elephants with no recourse to express their species-typical behaviours combined with no way of handling an increasing captive population in the event of captive births.
2. Continued maintenance of elephants by temples/ private owners but with the prerequisite of providing natural conditions such as physical space with vegetation, unfettered existence, presence of companions (male and female) or at least keeping two or more elephants together, followed by strict monitoring of work schedule.
    - Work schedule should not be packed with attending as many festivals as possible in order to generate higher income. One way of avoiding this could be higher remuneration per festival which may increase the burden on "devotees". Irrespective of the remuneration generated, the number of festivals/ parades attended by an elephant should be limited both in number and duration.
    - Another aspect of work is that the elephants should be provided natural (that is, physical space with vegetation, water, conspecifics, absence of chaining, opportunity to forage) transit living conditions in between periods of work. This implies not only restricted duration of work for the elephants but also provision for the elephants' needs between work hours.
    - Private elephants within a region could think of setting up a common facility capable of holding each participant's elephant. This can be done independently or in association with the forest department. This will ensure presence of companions for the elephants, socializing opportunities and expression of species-typical behaviours within a limited context.
    - Feeding the elephants needs to be managed scientifically, that is, not only the nutrient needs of the elephants but also psychological stimulation can be an objective while feeding the elephants; cultivation of fodder crops by temples can be practiced

- Establishment of mobile veterinary units to provide health care Motivational measures to be implemented for boosting morale of mahouts/ cawadies and schemes to improve their welfare
- General public must be allowed to view elephants at a distance and not allowed to touch or abuse elephants during parades or festivals or transportation or rest

Thus, a combination of a natural living environment and regulated working conditions could improve the elephants' welfare status. This option will however, not encompass the future of elephant keeping by private owners. A policy needs to be framed on sourcing of new elephants in the event of death of existing animals and the maintenance of a growing captive population in the event of births among the existing population.

Introduction

Based on known history of elephants' association with people in the Indian region, ownership of elephants by individuals may have been blurred by the congruence of responsibilities between the single owner and the community. With greater diversification of labour and/ or introduction of paper based legal titles, the distinction between different ownership types may have become clearer. This, however, has not ensured information availability on the status of elephants with private owners (individuals).

Objective

The 2005 – 2010 All India Captive Elephant survey (conducted by CUPA-ANCF-WSPA) collected relevant data on privately owned elephants in order to:

- Gather information on the welfare status of these elephants in terms of existing captive conditions (physical and biological)
- Collect information on the professional experience and socio-economic status of handlers (mahouts/cawadis)

Method

An All India Captive Elephant Survey was launched in 2005 with the joint participation of World Society for Animals (WSPA), U.K., Compassion Unlimited Plus Action (C.U.P.A.), Bangalore and Asian Nature Conservation Foundation (A.N.C.F.), Bangalore. Information regarding elephants and handlers was collected by direct observation and through interview of relevant personnel.

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b

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d

e

f

Figures 1a, b, c, d, e and f: Data collection, observations of elephants from private owners (a, b, c, and d), interactions with private owner (e) and an elephant handler (f)

Data collection was achieved by involving teams of volunteers drawn from educational institutions/ nature clubs. The teams were given short-term training by experts from A.N.C.F. regarding collection of data. A section of the data related to population demography was assessed for the same. Another section was used for assessing welfare status of elephants as well as professional experience/ socio-economic status of handlers.

Welfare status of elephants

The living environment, physical and biological, experienced by elephants in captivity may impose deficiencies or inequalities from those experienced by their wild counterparts. It is this difference from the wild that has been used to assess the welfare status of captive elephants. A range of captive features, both physical and biological, have been observed and compared with those observed for wild elephants. These features include the physical environment as well as the social, reproductive and health aspects of the elephants. The greater the difference between captive and wild variables, the poorer the welfare of the captive animal. In addition, veterinary care and health parameters were considered, as any captive situation cannot do without these two important features. As captive living conditions are not uniform across regions/management types, each of the observed variables was rated on a 0 – 10 scale.

The rating method

A rating scale from zero (unsuitable conditions) to ten (suitable conditions) was used to assess the welfare status of captive elephants. Experts (both wild and captive elephant specialists, wildlife veterinary experts, managers from protected areas, those having both wild and captive elephants and other wildlife, members of welfare organisations and elephant handlers) were invited to assess the welfare based on welfare parameters and their significance through an exclusive workshop conducted on the subject (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). Experts rated a total of 114 welfare parameters covering major aspects of captivity

- The experts, based on their concept of the importance of a particular parameter to an elephant, developed rating for each parameter. For example mean expert rating of 8.0 (SE= 0.5, n=29; n= number of responses) for a parameter 'floor' and 9.0 (SE=0.4, n=31) was arrived for 'source of water' from the ratings suggested by each expert.
- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter.
- Elephants were visited on the ground; data for each parameter was collected by direct observations or with the interviews of people associated the animal. Ratings were assigned to each parameter for each elephant and Mean Rating (M-R) was calculated for a given parameter by averaging across the observed elephants. Thus the Mean Rating (M-R) denotes welfare status of existing conditions on the ground for the particular parameter.
- For example, if an elephant is exposed only to natural flooring, the animal receives a M-R of 8 and for entirely unnatural flooring the value is 0; if an animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 3.5 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 2.5 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5.
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. For example, the variables shelter type, shelter size, floor type in the shelter; all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. M-R is also based on similar lines.
- E-R and M-R for each of the regimes represent the average across related parameters observed for the regime. For instance, E-R / M-R for a parameter "shelter" represents the average of related parameters (termed sub-parameters) such as type, flooring, size, and shade availability.
- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm.
- The same rating logic has been applied to the set of observed features for handlers, viz., comparison of mean rating for each of the observed variables (M-R) with those prescribed by the expert team (E-R). Greater deviation implies poorer professional experience or socio-economic status.
- n* refers to number of states.
- n refers to number of elephants observed
- $n^{\dagger}$ refers to total number of parameters observed

Results

Information on population demography was gathered from 775 elephants belonging to owners in seven states— Andaman, Assam, Bihar, Karnataka, Kerala, Rajasthan (Jaipur) and Tamil Nadu. Kerala contributed 66% to this sample, Rajasthan (Jaipur) 15%. Figure 2 shows the sex based

age distribution for the observed elephants. The ages of 14 males and 4 females was not known. Considering both males and females together, 63% (n= 757) of the sampled population was made up elephants in the age group 16-40 years, followed by 25% in the age group 41-60 years. Sub-adults (6-15 years) formed 7% and juveniles (1-5 years) 4%. The occurrence of calves and elephants older than 60 years was less than 0.5%.

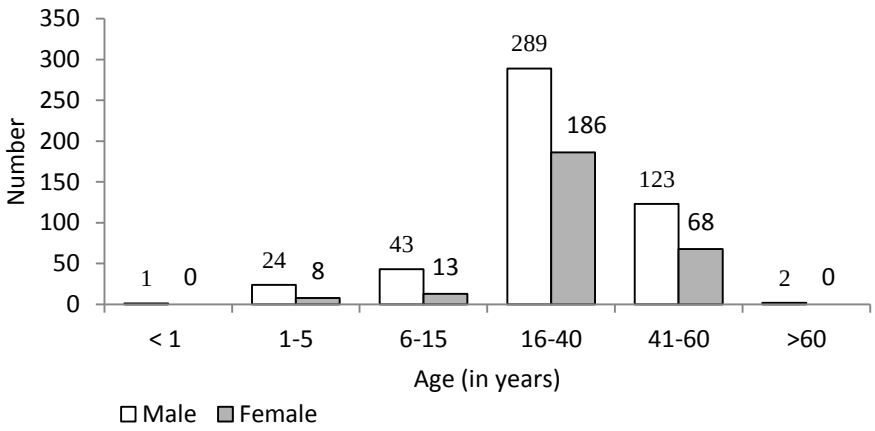

Figure 2: Age distribution of observed privately owned elephants

The ratio of males to females showed absence of female calves and female elephants aged more than 60 years for every male in the same age class. Male: Female ratio was 3:1 for both juveniles and sub-adults. This ratio was 2:1 for the age groups 16-40y and 41-60y.

Source

Eighty four percentages (n= 172) of the elephants (males and females considered together) had been purchased or gifted or transferred across owners.

- For every 1 male, two (1.9) females had been purchased/transferred/ gifted across owners
- For every 1 male, two (1.7) females had been acquired through capture
  For every 1 male, two (2.0) females had been acquired through captive birth

Mean Rating (MR) for source (in terms of acquisition of elephants) was 1.4 as compared to an Expert Rating (ER) of 6.0 showing a deviation of 77% from prescribed norms.

Shelter

Close confinement captivity can have consequences on the psychological health of the animals (Bradshaw, 2007). Wild elephants have vast home-ranges, traversed as they engage in species-specific activities.

Prevailing shelter conditions (Figures 3a,a b, c, d, e, f, g, h, i, j, k and l)

- Seventeen percentages (n= 210) were maintained in forest areas, 60% in covered type man-made shelters and 18% were tied in the open (no forest)
- Thirty percentages (n= 170) were exposed to natural floors (earthen/mud)

MR was 3.7 (SE=1.0, n*= 6) with a deviation of 54% from ER.

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Figures 3a, b, c, d, e, f, g, h, i, j, k and l: shelter provided to elephant kept under private ownership, private elephant (a) with natural forest available for free ranging (b), un natural shelter, floor available for elephants from different private owners (c, d, e and f), private elephant returning to their camp after free ranging in a forest (g), mud floor for elephants(h and i), tin sheet roof (j) and shelter hygiene (k and l)

Water

Depending on the source of water and whether the elephant is allowed unrestricted movement, availability of water can vary. Running sources of water such as river/stream can be accessed by elephants when needed (unrestricted movement allowed) and are less contaminated than stagnant source of water.

Prevailing conditions (Figures 4a, b, c, d, e and f).

- Only 19% (n=98) elephants had access to rivers/streams
- Bathing place was the shelter itself for 30% (n= 76); a combination of various sources (rivers/ ponds/ tanks/ taps) was available for other s; 14% were bathed in pond/lake/using tap water

a

b

c

d

MR was 3.7 (SE= 0.4, n*= 6) indicating a deviation of 54% from ER.

e

f

Figures 4a, b, c, d, e and f: Sources of water for captive elephants kept under private ownership, (sea as source (a) river (b) elephant standing next to a water tank (c) ; the tank water is used for both drinking and washing the animal, water through hose pipe (d) tap as source (e) and small pond or lake as source (f)

Walk

In captivity, opportunity to walk on natural terrain may not only be restricted but also be unavailable as such elephants may be exposed to tar roads or concrete. Absence of opportunities to walk and exposure to hard substrates can be harmful to an elephant's physical health (Olson, 1994).

Prevailing conditions (Figures 5a, b, c, d, e and f)

- Ninety two percentages of elephants (n= 92) were given opportunity to walks
- Nature of terrain varied─ roads , forest areas
- Mean distance covered was 7.5kms/day (SE= 1.0, n= 54) in a duration of 2.4hrs (SE= 0.2, n=41)

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Figures 5a, b, c, d ,e and f: Scope for walk for elephants under private ownership, walking on main road (a and b), walking in forested region (c), walking for work related activities (d, e and f)

MR was 5.3 (SE= 1.1, n*= 5) implying a deviation of 41% from ER.

Social interaction

Interaction among elephants forms an integral part of its life. Opportunity for interaction maybe restricted or absent for captive elephants.

Prevailing conditions (Figures 6a, b, c, d, e, f, g, and h)

- Eighty six percentages (n= 92) of elephants were allowed interaction with other elephants; interaction opportunity was subject to work schedule/managerial decisions
- Mean interaction duration was 8.6hrs (SE= 1.0, n= 65)
- Mean group size was 6.0 (SE= 0.7, n= 70)

MR was 4.5 (SE= 1.2, n*= 6) with a deviation of 44% from ER.

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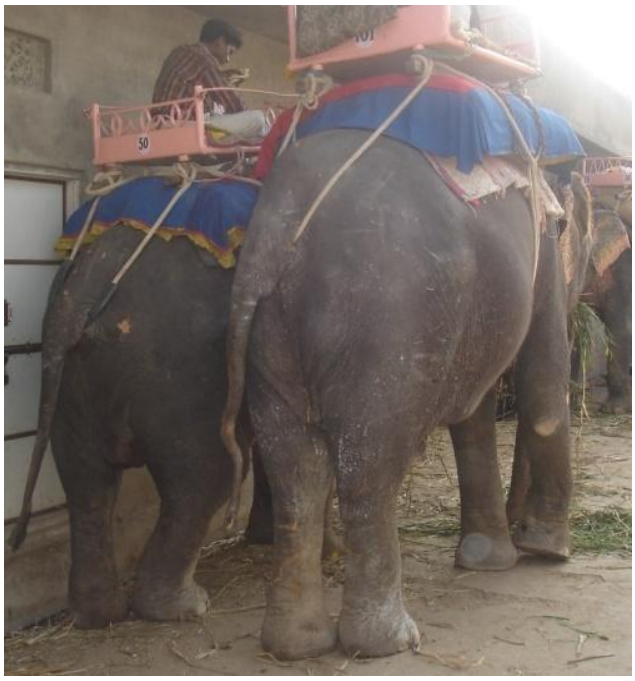

g h

Figures 6a, b, c, d, e, f, g and h: Scope for social interactions among the elephants kept under private ownership, kept alone (a, b, c and d), kept as group or more than 1 elephants (e, f, g and h)

Chaining

While it is almost universal in its use among captive elephants, chaining can be deleterious not only in restricting movement but also in inhibiting expression of species-specific behaviours, leading to poor welfare.

Prevailing conditions (Figures 7a, b, c, d, e, f, g and h)

- Only 11% (n= 252) elephants were allowed to range-free as well as chained; the rest were not allowed to range-free
- Thirty five percentages (n= 77) elephants were chained using spikes or were hobbled by their fore-legs
- Mean chaining duration was 15.8hrs (SE= 0.7, n= 71)

a b

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h

Figures 7a, b, c, d, e, f, g and h: Types of chained used for elephants under private ownership, chained in tress (a and c) spike chains (b and e) hobbled (d), chained while attending temple festival (f), chained at shelter (g) and calf tied to mother (h)

MR was 1.3 (SE= 0.5, n*= 6) with a deviation of 84% from ER.

Observed behavior

Knowing the "temperament" of an elephant can assist a handler in dealing with his/her elephant. The occurrence of abnormal behaviours such as stereotypy has been associated with absence of opportunities to express species-specific behaviours (Mason, 2006).

Prevailing conditions

- Of 199 elephants, 82% were described a "quiet," 18% as quiet and/ or aggressive/ nervous/ agitated/undependable, 1% as aggressive
- Twenty tow percentages (n= 58) of elephants had been reported to be involved in incidents of killing/injury
- Stereotypy was exhibited by 40% (n= 62)

MR was 5.3 (SE= 0.5, n*= 6) indicating a deviation of 34% from ER.

Work

Work performed by elephants may/may not be in tune with its natural behavioural repertoire. Even if it is similar to its natural behaviour, work schedule will interfere with available opportunities for elephants to express its species-typical behaviours.

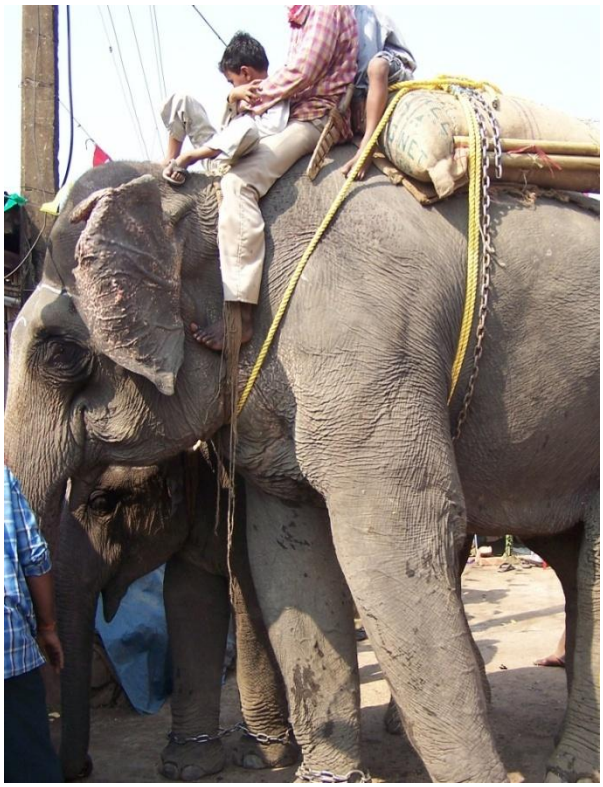
Prevailing conditions (Figures 8a, b, c, d, e, f, g and h)

- Ninety percentages the elephants (n= 206) were used for work
- Work type was use in timber operations, for tourism, in festivals/functions
- Mean work duration was 6.4hrs (SE= 0.3, n= 64)
- Mean maximum weight carried by elephants was 225kgs (SE= 18.6, n= 40)

a

b

MR was 4.1 (SE= 0.9, n*= 6) showing a deviation of 49% from ER.



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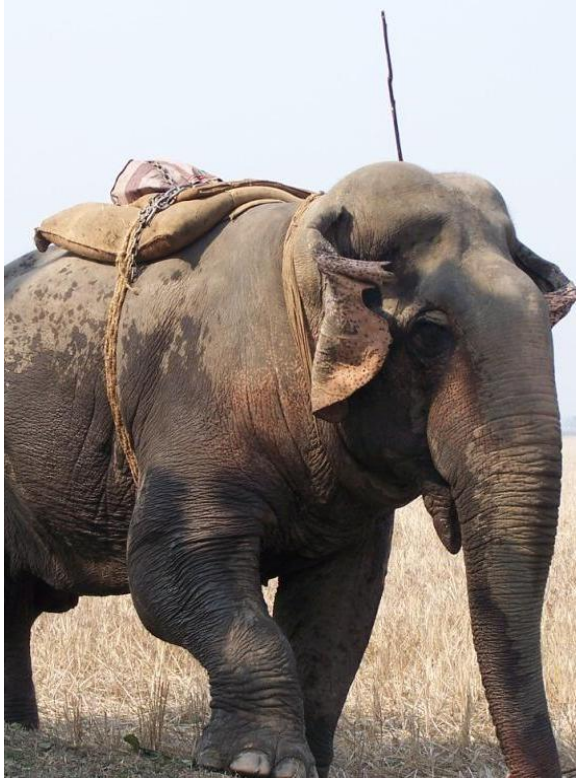

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g h

Figures 8a, b, c, d, e, f, g and h: Work types exposed to the elephants under private ownership; Private elephant used for tourism related activities (a and b), carrying public (c, e, g, and h), returning from cine shooting (d) displayed in temple festivals (f)

Food

Opportunity for foraging ensures availability of wider range of plant types and also prospects of expression of species-specific behaviours. In captivity this is limited either by duration or by absence of free-ranging opportunity.

Prevailing conditions (Figures 9a, b, c, d, e, f, g, h, i and j)

- Forty six percentages (n= 93) of elephants were allowed to forage as well given stall feed, remaining were given only stall-feed
- Stall feed types were: Jowar/ Sorghum straw, Jaggery, Chapatti, sugarcane, Palm leaves, grass, banana, water-melon, coconut, horse-gram, Banyan stem, bamboo

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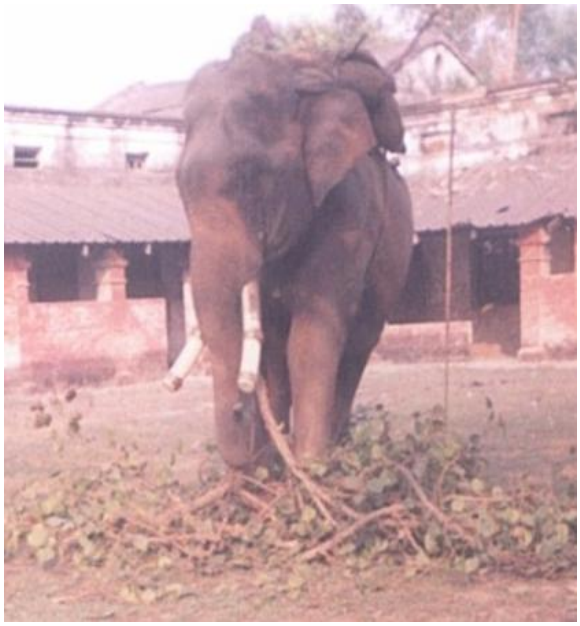

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Figures 9a, b, c, d, e, f, g, h, i and j:Food items provided to elephants kept under private ownership; Scope for free grazing stall feeding (a, b, c and d), stall fed both non-cooked and cooked items (e, f, g, h, i and j

MR was 3.0 (SE= 0.7, n*= 6) with a deviation of 67% from ER.

Reproductive status

The expression of normal reproductive behaviour among adult elephants maybe impeded in captivity by absence of individuals of opposite sex, acyclicity due to various causes, infanticide, etc (Clubb and Mason, 2002).

Prevailing conditions (Figures 10a, b, c, d, e and f)

- Among 14 females (for whom data was available), oestrus was reported for 11 elephants
- Nine females (for whom data was available) were exposed to males
- Two of ten females were given opportunity to breed
- Only one elephant (of four) had given birth
- Reproductive activity or musth was reported for 62% (n= 37) male elephants
- All musth elephants were chained and/or isolated

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d

e

f

Figures 10a, b, c, d, e and f: Reproductive status of elephants observed from private ownership, not exposed to female elephants (a and b), exposed to male elephants from wild (c), exposed only to same sexes (d and e), a female with a calf which she delivered after reaching to a private owner's custody (f)

MR was 4.0 (SE= 0.7, n*= 6) indicating a deviation of 50% from ER. MR refers to reproductive status considering both males and females together.

Health status and veterinary facilities (Figures 11a , b, c, d, e, f, g and h)
Maintenance of health and timely veterinary intervention will ensure good physical health. Poor physical health may also indicate exposure to unsuitable conditions, for instance, exposure to improper substrates may result in foot problems.

Prevailing conditions

- Sixty three percentages of elephants (n= 153) were reported to have foot/leg problems; 16% had eye problems (cataract/blindness); 14% reported such instances as anemia, GI problems, Urinary problems, respiratory problems, worms, wounds and abscess was seen in 7% of the elephants
- Eighty nine percentages of elephants (n= 158) had been dewormed, 75% (n= 160) immunized and sample tests of dung/urine/blood had been done for 78% (n= 157)
- Veterinary doctor was available for all elephants (n= 173)
- Ninety six percentages of elephants (n= 48) were on call or visited monthly, 4% visited weekly or fortnightly

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Figures 11a, b, c, d, e, f, g and h: health status and veterinary care available to the elephants under private ownership, , Injuries to the eye (a), sun burns (b) Injuries to leg c, d, e), unusual wart in elephant trunk (f), veterinary doctors available elephant of this category (g and h)

MR was 5.1 (SE= 0.7, n*= 6) showing a deviation of 36% from ER. This rating refers to combined status of health and veterinary care facilities.

Overall welfare rating for privately owned elephants

Overall welfare rating for privately owned elephants (MR, considering all parameters together) was 4.0 (SE= 0.4, n†= 10) showing a deviation of 50% from ER. Considering the divergence from ER for each of the parameters observed, six of the ten parameters showed deviation of 50% or more, implying divergence to this extent from norms prescribed by the expert team.

Mahout (cawadi) professional experience and socio-economic status

Professional experience

As a family tradition, handlers, as children, would learn about elephants watching/participating in elephant related activities. This would imply learning from an early age and association with an elephant through its growing years.

Prevailing conditions (Figures 12a, b, c, d, e and f)

- Mean age of handlers was 31.2yrs (SE= 0.7, n= 168)
- Mean experience in this profession was 15.9yrs (SE= 0.7, n= 156)
- Mean experience with most recent elephant was 4.1yrs (SE= 0.5, n= 145)
- Eighty four percentages (n= 67) of handlers had opted for this profession as a means of employment, 12% as a traditional occupation, 3% out of interest in this profession and 1% as an employment source and a traditional occupation.

MR was 5.5 (SE= 0.3, n*= 5) showing a deviation of 39% from ER.

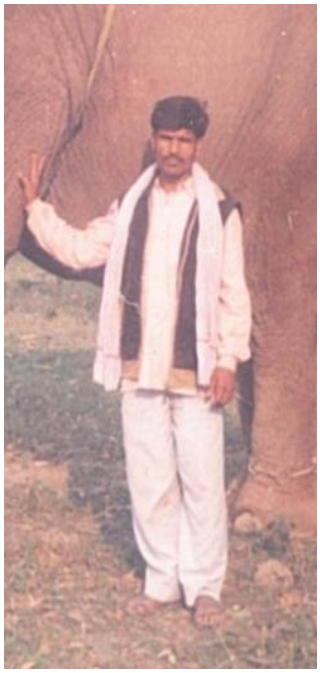
Socio-economic status

Poor income, absence of additional benefits from this profession and prevailing social habits may lead to stress among the handlers.

Prevailing conditions

- Mean annual salary was Rs.23,304/- (SE= 2880, n= 146)
- Mean number of children per family was 2 (SE= 0.2, n= 148)
- Insurance cover was available for 20% (n= 45) of handlers
- 54% (n= 41) reported alcohol consumption

a



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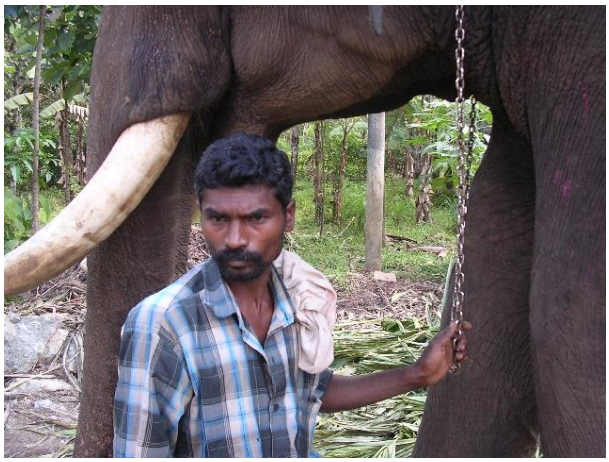

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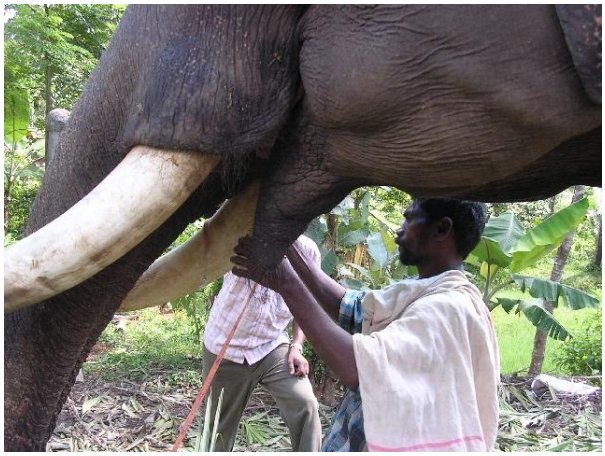

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Figures 12a, b, c, d, e and f: Profiles of elephant mahouts associated with private elephants

MR was 3.2 (SE= 0.4, n*= 6) with a deviation of 54% from ER.

Discussion

The rating shows a deviation of 50% or more for the following features: shelter provided, water source and bath related features, chaining, work, food provisioning and reproductive status of elephants. Captivity features, except chaining, were also region specific, i.e., in states like Assam and Andaman, the elephants were provided forest areas as shelter space. This was lacking for most elephants among the other states observed.

Varied water sources were the norm for all elephants, with availability of rivers reported for Assam and Andaman elephants.

Work formed a unifying feature for all elephants, only 5% were not used for any work. This decided the nature of shelter/water/ availability of other elephants for interaction. Work related to timber operations involved exposure to at least natural substrates. Tourism oriented work were, predominantly, in urban regions with concomitant exposure to un-natural conditions.

The elephants which were not used for work (as in the state of Bihar) were not provided features conducive to elephant welfare— owning elephants represented a social status— expression of species-typical behaviours were conspicuously absent.

Free-ranging opportunity was restricted to few elephants (27 of 252) implying the priority accorded to restriction on free movement of the elephants. Simultaneously, opportunity to forage in natural conditions was not available.

Management efforts towards ensuring expression of species-typical behaviour in terms of normal reproduction may have been lacking resulting in greater deviation from prescribed norms.
All of the above imply the extent to which species-specific behaviours were not an option for the elephants.

Regarding handlers, mean experience with most recent elephant as compared to experience in this profession indicates frequent change of elephants. This maybe due to change of jobs by the handlers or transfer (sale/purchase) of elephants by the owner leading to comparatively lesser experience with current elephant.

Absence of insurance cover in a job that has reported death/injury is a serious drawback. Added to this, is the remuneration that could be considered insufficient (to support a family) in urban areas.

References

1. Bradshaw, G.A. (2007). Elephants in captivity: analysis of practice, policy, and the future, Society & Animals: 1-48
2. Clubb, R. and Mason, G. (2002) A review of the welfare of zoo elephants in Europe: A report commissioned by the RSPCA. Oxford, U.K., University of Oxford, Animal Behaviour Research Group, Department of Zoology.
3. Mason, G. (2006) Stereotypic behaviour in captive animals: fundamentals and implications for welfare and beyond, in: Stereotypic animal behaviour : fundamentals and applications to welfare (Mason, G. and Rushen, J. eds.,) 2nd edition, pp:325-355.
4. Olson, D., Keele, M. and Tuttle, D. (1994). Husbandry and management, In: Medical management of the elephant (Mikota, S.K., Sargent, E.L. and Ranglack, G.S. eds.), Indira Publishing House, U.S.A., p:27-31
5. Varma, S. 2008. Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 7-16. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

6. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity—insights and recommendations, In: 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. (S. Varma and D. Prasad, eds.), pp. 54-64. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
7. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 17-53. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

Section 2:
Captive Elephants under Private Ownership in Andaman

Executive summary

Private ownership of elephants includes individual owners as well as timber companies. Approximately 75 elephants were under private ownership, which were kept for contractual work with the Forest Department. Following the Supreme Court's judgment on winding up of timber extraction activities, most of the elephants (barring around 10 privately owned elephants) were sold to mainland buyers. Most of the buyers were from the states of Kerala and Tamil Nadu interested in employing the elephants for temple activities. Privately owned elephants, irrespective of the reason for their maintenance, continue to exist in Andaman Islands.

This investigation assesses the welfare status of both elephants and their handlers in forest camps of Andaman Islands. Welfare status of the elephants has been assessed by comparing physical/ physiological/ social and psychological features in captivity with those observed in the wild. Based on a welfare rating scale developed by experts, Experts' Rating (E-R) was evolved to collect and compare the same with the Mean rating (M-R) obtained from the ground, that denotes welfare status of existing conditions for the particular parameter.

Information on three elephants, two females and an adult male, belonging to two owners, was collected. The male elephant was maintained in Havelock Island and the females were in Makarti Valley. Information on the two female elephants was limited to a few (N= 12) parameters only, for the male, data was available for 33 parameters.

The adult male had been purchased by a private owner when the elephant was 21y old. The elephant was leased to the present owners. M-R for source was 2 indicating a deviation of 75% from E-R.

All elephants, the adult male and the two females, were kept in and near forest areas. The male elephant was tied in a shed from 2p.m. to 6a.m. M-R was 7 implying a deviation of 10% from E-R.

All elephants had access to streams. During musth, the male elephant was provided water through a hose. M-R was 4 with a deviation of 45.4% from E-R.

The adult male was maintained in social isolation. The two females were kept together; interaction duration was 24 h. M-R was 4 with a deviation of 48% from E-R.

The male elephant was tied from 2p.m. to 6a.m. in its shed, left to forage from 6 a.m. to 9a.m. Both females were allowed to free range in the forest at night; the male elephant was tied in its shed. M-R was 2 showing a deviation of 76% from E-R.

The male elephant was described as quiet, but aggressive towards people. Stereotypic signs of medium intensity were exhibited during musth. M-R was 5 implying a deviation of 42.4% from E-R.

Work type for the male elephant was tourism related duties: diving in the sea with tourists and duration was 9a.m. to 2p.m. M-R was 3 with a deviation of 62.5% from E-R.

Both stall feed and free-ranging to graze/browse was provided for the male. Food given was banana, sugarcane, paddy (*Oryza* sp.)- 10 kgs, *channa* (*Cicer arietinum)* - 3 kg and no incidents of crop raiding were reported. M-R was 6 with a deviation of 25% from E-R.

Musth was reported for the adult male, the elephant was chained, isolated during musth. The male was not exposed to female elephants, no calves sired in the present location. M-R was 2 with a deviation of 75% from E-R.

Lacerated wounds were seen on left hind leg (likely to have been caused by chains) of the male elephant. Veterinary doctor was available for all the elephants and the doctor's visit for the male elephant were monthly, when needed another doctor was called to treat. M-R was 5 with a deviation of 46% from E-R.

The mahout who looked after the male elephant had a total of 10 yrs experience in this profession. Experience with the male elephant was only 1yr and he used Knife/wooden ankush/Stick to control the elephant. M-R was 6 showing a deviation of 36% from E-R. The mahout had attended school up to the 8th standard, annual salary given to him was Rs.36, 000/-, there was no insurance cover for the mahout and he consumed alcohol, after work. M-R was 3 showing a deviation of 66% from E-R.

The overall M-R for all observed elephants was 4 showing an overall deviation of 48% from E-R.

Introduction

Known sources of private ownership of captive elephants in the Andaman Islands dates back to the period of timber harvest/ logging operations during British rule. Some of these elephants have become feral, having been abandoned by their owner/s during the later part of 20th century (Sivaganeshan and Kumar, 1994). Privately owned elephants, irrespective of the reason for their maintenance, continue to exist in the islands.

Objective

A change in management may imply a change in the living conditions provided for the elephants. Hence, a survey was conducted to:

- Assess the welfare status of sampled captive elephants maintained by private owners
- Assess the professional experience and socio-economic status of handlers (mahouts/ cawadis)

Method

Studies in the wild have brought forth data on ecological and social aspects of elephants (Barber, 2009); this can serve as a benchmark for comparison with the living conditions of captive elephants. Long life span, extensive distances covered, physical strength, complex social organization─ are features characteristic of wild elephants. Such animals are brought under human control and provided a set of features─ physical space/ social aspects in the form of presence of elephant companions/biological needs─ restricted by economic/ other considerations, leading to a difference in the living conditions of captive elephants from those experienced in the wild. This difference from the wild forms the basis for assessing the welfare status of elephants in captivity in this survey.

Welfare status of the elephants has been assessed by comparing physical/ physiological/ social and psychological features in captivity with those observed in the wild. Deviations from wild conditions have been considered to represent poor welfare. The greater the deviation, the poorer the welfare. Deviation from the conditions in the wild for the parameters observed was rated using a scale developed by elephant experts.

The rating method

A rating scale from zero (unsuitable conditions) to ten (suitable conditions) was used to assess the welfare status of captive elephants and their handlers. Experts (both wild and captive elephant specialists, wildlife veterinary experts, managers from protected areas, those holding both wild and captive elephants and other wildlife, personnel from welfare organisations and elephant handlers) were invited to assess the welfare based on welfare parameters and their significance, through an exclusive workshop conducted on the subject (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). Experts rated a total of 114 welfare parameters covering major aspects of captivity

- The experts, based on their concept of the importance of a particular parameter to an elephant, developed a rating for each parameter. For example mean expert rating of 8.0 (SE= 0.5, N=29) for a parameter ‘floor’ and 9.0 (SE=0.4, N=31) for ‘source of water’ was arrived at for from the ratings suggested by each expert

- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e., for a parameter with 8.0 as the maximum value, only 2.0 (25%) deviation and parameter with maximum value 9.0, only 1.0 or 10% from the prescribed norm is considered acceptable.
- For example, if an elephant is exposed only to natural flooring, the animal receives a rating of 8 and for entirely unnatural flooring the value is 0; if animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 3.5 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 2.5 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5.
- Therefore, using the maxima given by experts as a base, a rating scale starting from zero to the particular maximum value for that parameter has been used and the data for each animal was collected, for a given animal or group of elephants in a given regime (for example, forest camp) Mean Rating (M-R) was calculated for a given parameter, along with its sub-parameter. Thus the Mean Rating (M-R) denotes welfare status of existing conditions on the ground for the particular parameter.
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. The variables have been termed sub-parameters. For example, the variables shelter type, shelter size, floor type in the shelter; all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. M-R is also based on similar lines.
- E-R and M-R for each of the regimes here represent the average across related parameters observed for that regime. For instance, E-R / M-R for a parameter "shelter" represent the average of related parameters (termed sub-parameters) such as type, flooring, size, and shade availability. Not all related parameters will be rated for each regime. The number of such related parameters varies for each regime.
- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate their professional/ socio-economic status, of value to the handler and his elephant.

Result

Information on three elephants, two females (age unknown) and an adult male (56y), belonging to two owners, was collected. The male elephant was maintained in Havelock Island and the females were in Makarti Valley. Information on the two female elephants was limited to a few (N= 12) parameters only, for the male, data was available for 33 parameters; totally N= 35.

Source

Sourcing of elephants, whether wild-caught/ captive born/ shifted across owners has an effect on the life of the animal through a change in living conditions.

- The adult male had been purchased by a private owner (I) when the elephant was 21y old. The elephant was leased to the present owners (II) since last 5y (upto the year of data collection, 2007)

M-R for source was 1.5 (N=1) indicating a deviation of 75% from E-R.

Shelter

Availability of unrestricted access to forest areas is considered suitable for elephants as they can engage in species-typical behaviours.

- All elephants, the adult male and the two females, were kept in and near forest areas.
- The male elephant was tied from 2p.m. to 6a.m.
- The shed, for the male, was cleaned twice daily with broom, however, dung was visible

M-R was 7.2 (SE= 1.0, N*= 5) implying a deviation of 10% from E-R. It should be noted that of the five sub-parameters, two were exclusive to the male and one was exclusive to the female elephants. Considering only sub-parameters common to all elephants, M-R was 8.0 (SE= 0.0, N*=2) showing no deviation at all from E-R (Figures 1 and 2).

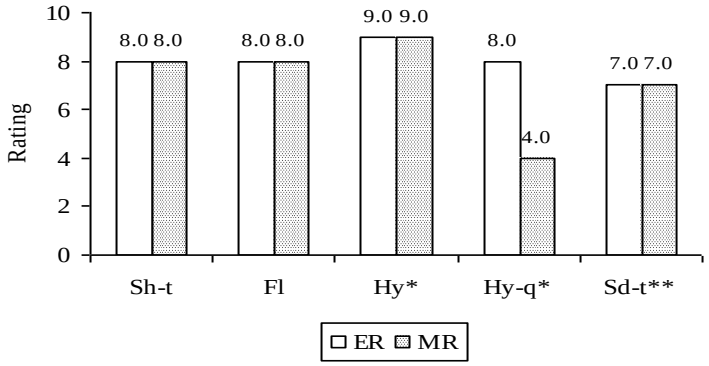
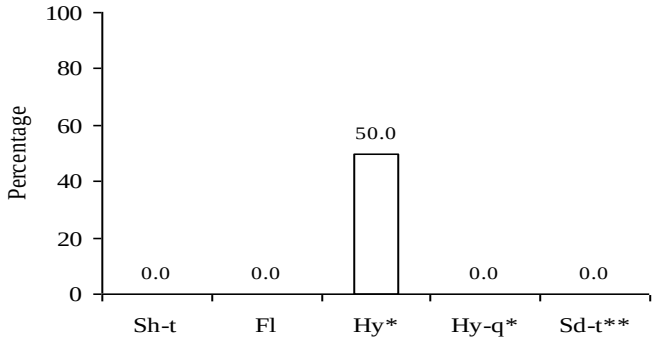


Figure 1: Comparison of E-R and M-R for shelter



h-t: Shelter type Fl: Flooring Hy: Hygiene maintenance Hy-q: Quality of hygiene maintenance Sd-t: Shade type

*: Parameter exclusive to male elephant, **: Parameter exclusive to female elephants

Figure 2: Percentage wise deviation from E-R for shelter

Water

Unrestricted access to running sources of water, when the elephants need it, is important. Such sources, in presence of other elephants, can help in performance of species-specific activities.

- All elephants had access to streams
- During musth, the male elephant was provided water through a hose, twice daily, reported to drink 10 trunkfuls

M-R was 4.4 (SE= 2.9, N*= 3) with a deviation of 45.4% from E-R. Considering only sub-parameters common to all elephants, M-R was 9.0 (SE= 0.0, N*=1) showing no deviation at all from E-R (Figures 3 and 4).

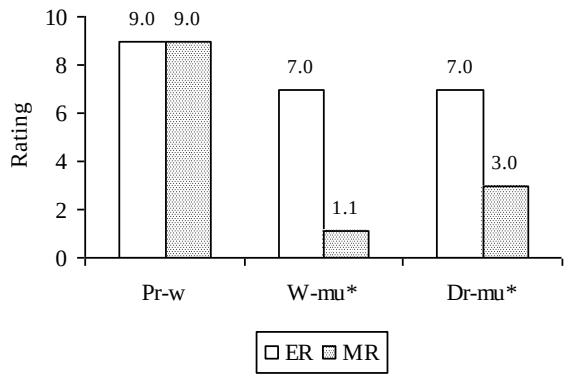
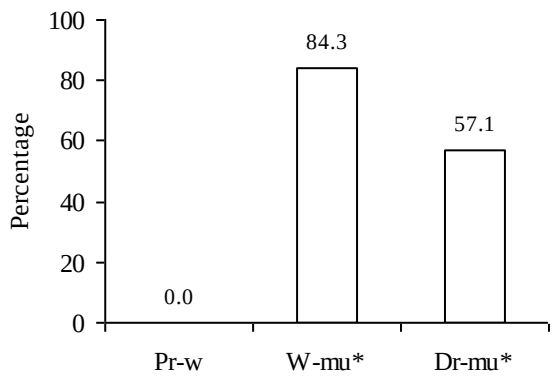


Figure 3: Comparison of E-R and M-R for water



Pr-w: Availability of perennial source of running water W-mu: Water during musth
Dr-mu: No. of times drinking water during musth

*: Parameters exclusive to male elephant

Figure 4: Percentage wise deviation from E-R for water

Social interaction

Elephant society is complex, lasting across generations with males gradually dispersing from their herds (Poole and Moss, 2008), or males have to learn about the strengths and weakness of

other males through interaction (Poole and Granli, 2009). Captivity generally imposes conditions restricting expression of their natural behavioural repertoire.

- The adult male was maintained in social isolation
- The two females were kept together, interaction duration was 24h

M-R was 4.2 (SE= 1.1, N*= 4) with a deviation of 48% from E-R (Figures 5 and 6).

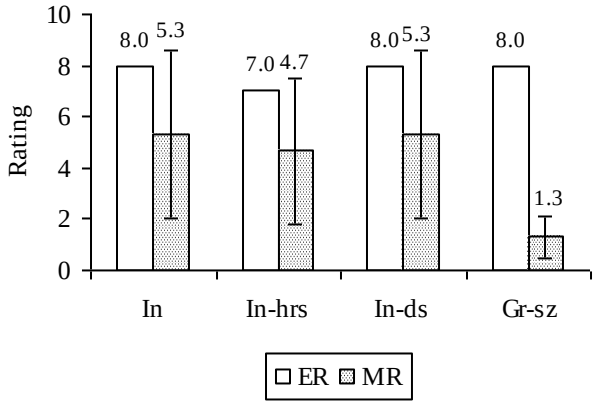
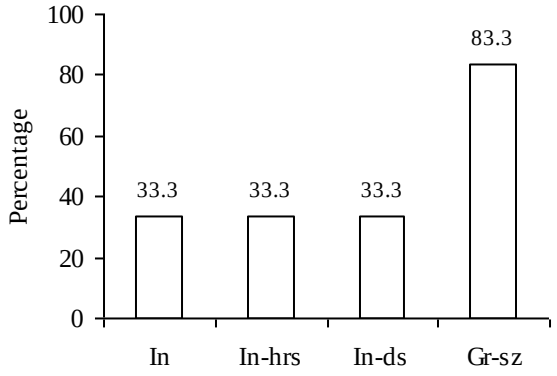


Figure 5: Comparison of E-R and M-R for social interaction



In: Opportunity for interaction In-hrs: Interaction hours In-ds: Distance between elephants
Gr-sz: Group size

Figure 6: Percentage wise deviation from E-R for social interaction

Chaining

Control and management of elephants is generally done by using chains on different parts of the body and restricting its movement.

- The male elephant was tied from 2p.m. to 6a.m. in its shed, left to forage from 6 a.m. to 9a.m.

- All the elephants were chained with plain types of chains; forelegs were hobbled for the male while free ranging, no information available for the females
- Both females were allowed to free range in the forest at night, the male elephant was tied in its shed
- For the male, chain dimensions were: length (leg)-12m, body-2m, corresponding weight-80kg, 15kg

M-R was 1.9 (SE= 1.3, N*= 5) showing a deviation of 76% from E-R. Considering sub-parameters common to all elephants, M-R was 3.1 (SE= 0.6, N*= 3) showing a deviation of 61% from E-R (Figures 7 and 8).

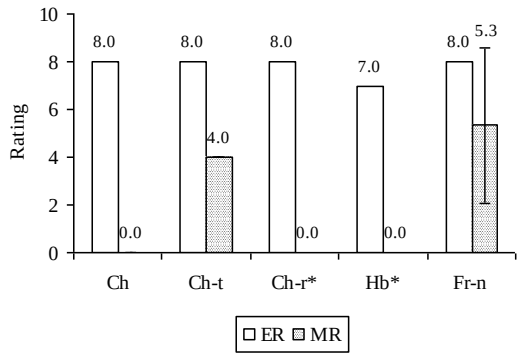
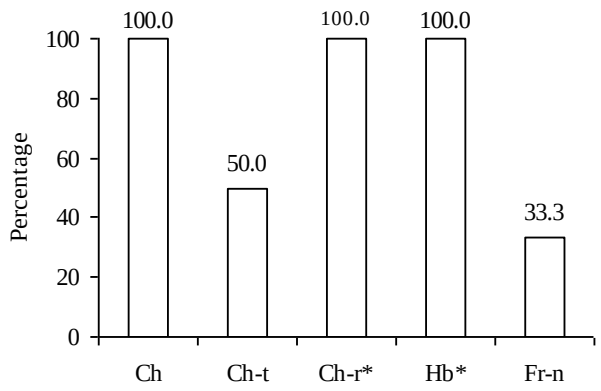


Figure 7: Comparison of E-R and M-R for chaining



Ch: Chaining status Ch-t: Chain type Ch-r: Region of chaining Hb: Hobbling of forelegs
Fr-n: Opportunity to free-free range at nigth

*: Parameters exclusive to male elephant

Figure 8: Percentage wise deviation from E-R for chaining

Observed behaviour

Manageability of elephants can be indicated by its temperament. Hence, this aspect was rated. Occurrence of stereotypy/ aggression was also considered as they can be linked to current/ previous poor welfare conditions. Data was available for the male elephant only.

- The elephant was described as quiet, but aggressive towards people
- Stereotypic signs of medium intensity were exhibited during musth

M-R was 4.8 (SE= 2.2, N*= 4) implying a deviation of 42.4% from E-R (Figures 9 and 10).

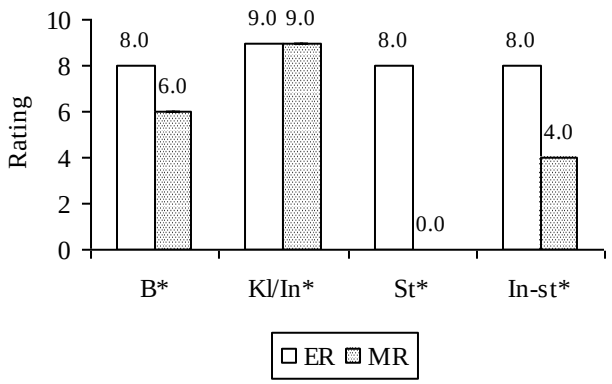
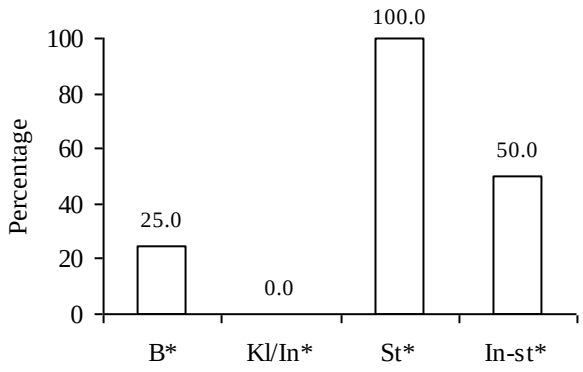


Figure 9: Comparison of E-R and M-R for observed behaviour



B: Behaviour (temperament) Kl/In: Incidents of killing/ injury St: Occurrence of stereotrypy
In-st: Intensity of stereotypy

*: Parameters exclusive to male elephant

Figure 10: Percentage wise deviation from E-R for observed behaviour

Work

The nature of work and working conditions determine the living conditions for elephants maintained exclusively for work.

Data was available for the male elephant only.

- Work type involved tourism related duties: diving in the sea with tourists
- Duration was 9a.m. to 2p.m.

- Food was given during work: banana (*Musa* sp.) - 20 kg, sugarcane (*Sacharum* sp.)- 10 no., jaggery (sweet derived from sugarcane)- 500gm

M-R was 3.0 (SE= 3.1, N* = 3) with a deviation of 62.5% from E-R (Figures 11 and 12).

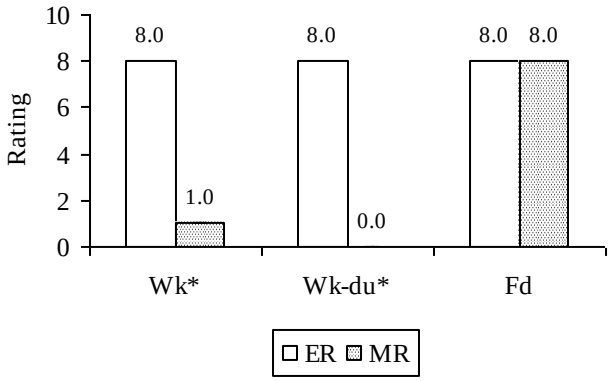
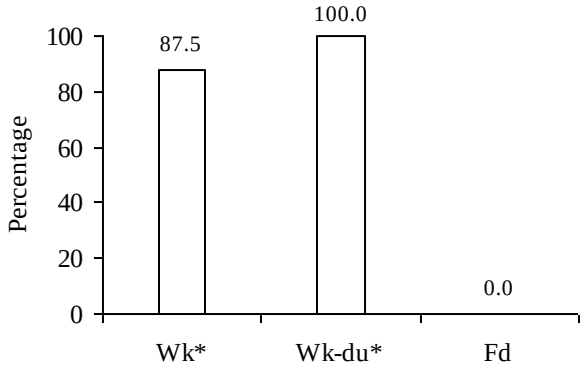


Figure 11: Comparison of E-R and M-R for work



Wk: Work type Wk-du: Duration of work Fd: Food given during work

*: Parameters exclusive to male elephant

Figure 12: Percentage wise deviation from E-R for work

Food provisioning

Foraging forms a major activity for wild elephants (Sukumar, 1991), feeding on a wide variety of plants, providing an opportunity for other herd members to learn efficient ways of feeding. Captivity may not provide this opportunity to its elephants. Data was available for the male elephant only.

- Both stall feed and free-ranging to graze/ browse was provided
- Food given was banana, sugarcane, paddy (*Oryza* sp.)- 10 kgs, *channa* (*Cicer arietinum)* - 3 kg
- No incidents of crop raiding were reported

M-R was 6.0 (SE= 2.5, N*= 3) with a deviation of 25% from E-R (Figures 13 and 14).

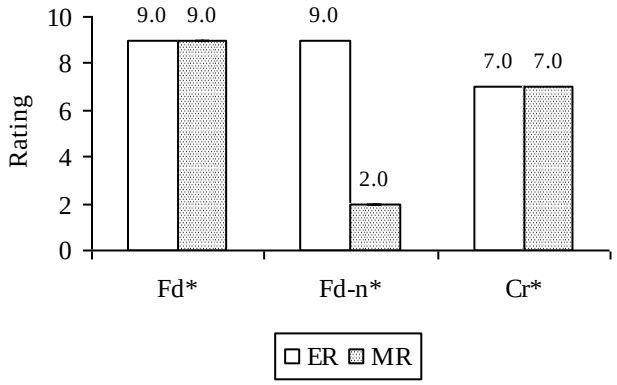
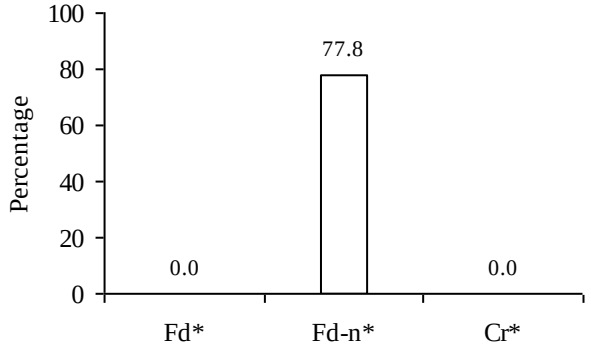


Figure 13: Comparison of E-R and M-R for food



Fd: Food provisioning type Fd-n: Number of food items Cr: Incidents of crop raiding

*: Parameters exclusive to male elephant

Figure 14: Percentage wise deviation from E-R for food

Reproductive status

Captivity may not be conducive for normal reproductive functioning, especially when elephants are maintained singly. Data was available for the male elephant only.

- Musth was reported for the adult male, the elephant was chained, isolated during musth
- The male was not exposed to female elephants, no calves sired in the present location

M-R was 2.0 (SE= 2.3, N*= 4) with a deviation of 75% from E-R (Figures 15 and 16).

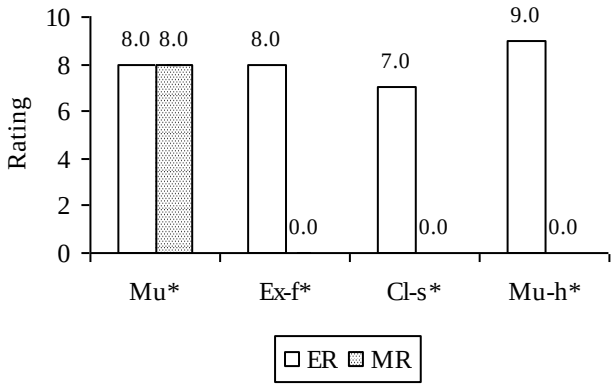
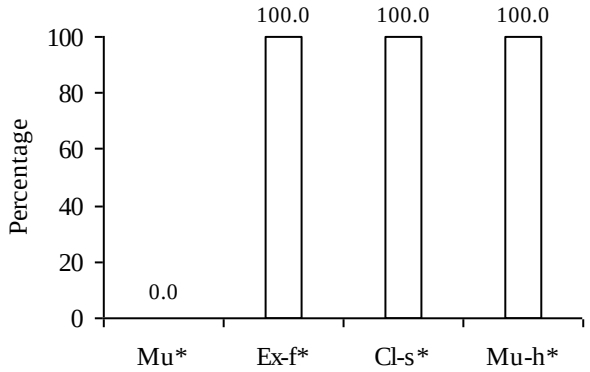


Figure 15: Comparison of E-R and M-R for reproductive status of male



Mu: Occurrence of musth Ex-f: Exposure to females Cl-s: Number of calves sired Mu-h: Musth handling

*: Parameters exclusive to male elephant

Figure 16: Percentage wise deviation from E-R for reproductive status of male

Health and veterinary care

Maintenance of health of captive elephants with proper veterinary facility is an essential feature, especially when the elephants are kept in un-natural living conditions/ subjected to an altered daily activity pattern.

- Lacerated wounds were seen on left hind leg (likely to have been caused by chains) of the male elephant
- Veterinary doctor was available for all the elephants
- Doctor's visits for the male elephants was monthly, when needed another doctor was called to treat
- Records were not kept for both female elephants

M-R was 4.9 (SE= 2.2, N*= 4) with a deviation of 46% from E-R (Figures 17 and 18).

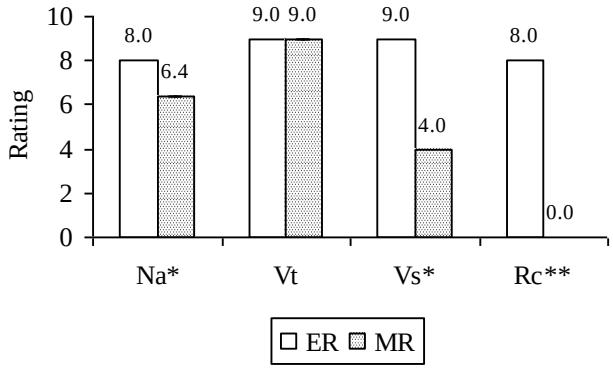
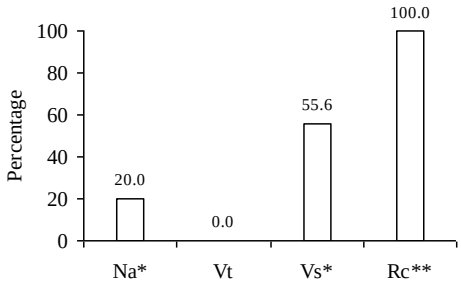


Figure 17: Comparison of E-R and M-R for Health and veterinary care



NA: Nature of disease/ injury Vt: Availability of veterinary doctor Vs: Frequency of visits
Rc: Maintenance of records

*: Parameter exclusive to male elephant **: Parameter exclusive to female elephants

Figure 18: Percentage wise deviation from E-R for health and veterinary care

Overall rating

The overall M-R for all observed elephants was 4.2 showing an overall deviation of 48% from E-R (see figure 19 for distribution of percentage deviation from E-R across all parameters). Availability of data for the female elephants maintained by one of the owners was limited to a few parameters. This, however, need not be a limiting factor if all the elephants are considered together in the category of private ownership. Sex related features can be excluded to provide a relatively accurate representative rating for all elephants under private ownership.

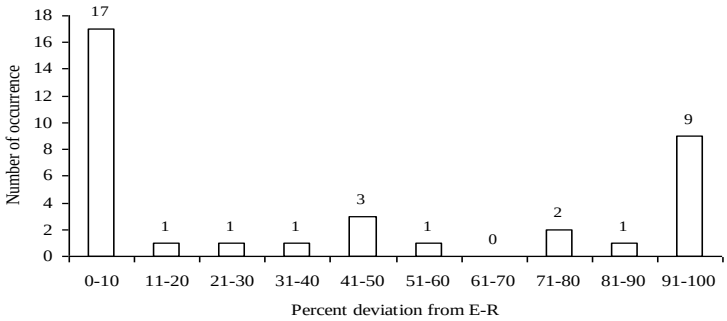


Figure 19: Distribution of percentage wise deviation from E-R across all observed parameters

Table-1 gives the M-R for each category of elephants. When reproductive status of the male is excluded, the M-R for the male elephant is comparable with that of the overall M-R (deviation of 51% and 48%, respectively, from E-R).

Table -1: Comparison of ratings across different scenarios

	E-R	M-R	SE	N
Overall M-R	8	4.2	0.6	36
Male elephant only	8	3.6	0.6	33
Male elephant (excluding reproductive status)	8	3.9	0.6	28
Female elephants only	8	6	0.9	13

Handler status

Professional experience and socio-economic status has been considered. Data was available for the mahout of the male elephant only. Age of the mahout was 28yrs.

Professional experience

- The mahout had a total of 10y experience in this profession
- Experience with the male elephant was only 1yr
- He had chosen this profession out of interest
- Was said to spend 8h with the elephant
- Used Knife/wooden ankush/Stick to control the elephant

M-R was 5.8 (SE= 1.3, N*= 4) showing a deviation of 36% from E-R (Figures 20 and 21).

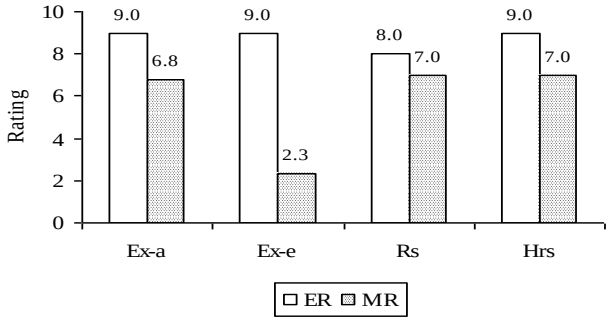
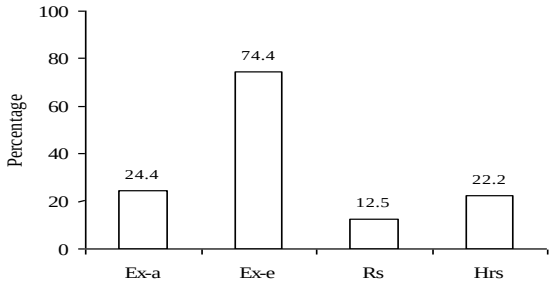


Figure 20: Comparison of E-R and M-R for professional experience of handler



Ex-a: Experience as % of mahout age Ex-e: Experience as % of elephant age
Rs: Reason for choosing this profession Hrs: Hours spent with elephant
Figure 21: Percentage wise deviation from E-R for professional experience of mahout

Socio-economic status

- The mahout had attended school upto the 8th standard
- Number of languages known were three
- Annual salary was Rs.36,000/-
- The mahout was not married
- There was no insurance cover
- Consumed alcohol, after work

M-R was 2.8 (SE= 1.0, N*= 6) showing a deviation of 66% from E-R (Figures 22 and 23).

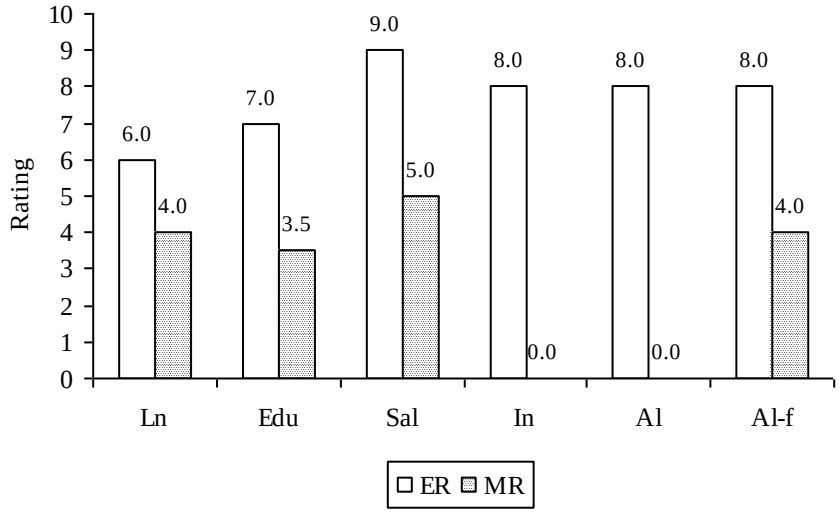
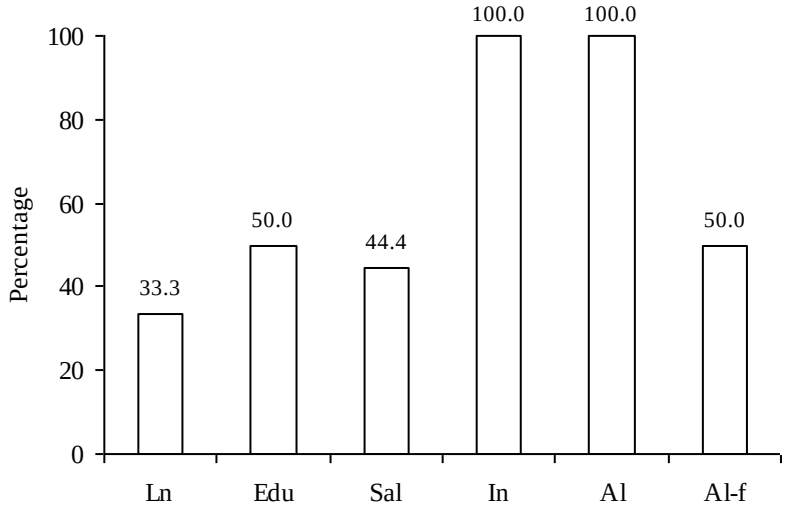


Figure 22: Comparison of E-R and M-R for socio-economic status of mahout



Ln: Languages known Edu: Education level Sal: Salary drawn
In: Insurance cover availability Al: Alcohol consumption Al-f: Frequency of alcohol consumption

Figure 23: Percentage wise deviation from E-R for socio-economic status of mahout

Discussion

Poole and Granli (2009) suggest that the biological and ecological needs of captive elephants are not different from those of their wild counterparts as they have not been genetically altered in captivity. The difference observed in living conditions in captivity from those in the wild has been rated to arrive at a welfare status for captive elephants. Figure 21 shows the distribution of deviations across all observed parameters for all the elephants. It can be seen that 44% of the parameters showed a deviation of 50% or more from E-R. The overall M-R for all observed elephants was 4.2 showing an overall deviation of 48% from E-R. When reproductive status of the male is excluded, the M-R for the male elephant is comparable with that of the overall M-R.

The higher M-R when the female elephants are considered exclusively is because:

- restricted data availability for these elephants
- The data comprised 54% of presence-absence type parameters, of which 71% indicated presence of suitable parameters. Such parameters need more data to provide greater insight into the extent of suitability to elephants, which was not available.

While the occurrence of suitable shelter with varied vegetation, space availability and natural flooring and the presence of streams was a positive feature, it was overrun by human controlled factors such as:

- Chaining and restricting movement of the elephants for varied duration— access to natural conditions was thus curtailed. In addition, the male elephant was tethered in a shed overnight. Gruber, et al., (2000) report of the association between increased frequency of stereotypy and chaining in elephants. Abrasion induced injuries maybe be difficult to heal (Kurt and Garai, 2002).
- Use for work— the male elephants was put to tourist related work for a duration of 5h. During this period, the elephant did not have any control over its activities. Following work, it was tethered in its shed, in isolation without individuals of its own kind.
- Restricted foraging opportunity for the elephants as a consequence of work or daily schedule of chaining
- Maintenance of the male in isolation without access to females

For the female elephants:

- Absence of records on the health/ reproductive status of the elephants are an indication of the care provided to the animals. Irrespective of the veterinary care available to the elephants, maintenance of information on the health history and normal reproductive functioning is integral to long-term well-being of the animals.

Handler status:

- The handler for the male elephant was trained in the profession by experience; this was not a traditional family occupation implying a difference in knowledge with regard to elephants in general and handling in particular.
- Relatively low salary was paid, which in conjunction with absence of insurance cover may prove to be economically detrimental
- The practice of alcohol consumption may prove to be deleterious to the handler in the long run

Reference

1. Barber, J.C.E. (2009). Unpacking the trunk: Using basic research approaches to identify and address captive elephant welfare concerns. In: An elephant in the room: the science and well being of elephants in captivity, (Forthman, D.L., Kane, F. L., Hancocks, D., and Waldau, P.F. eds.) Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Tufts University
2. Gruber, T.M., Friend, T.H., Gardner, J.M., Packard, J.M., Beaver, B. and Bushong, D. (2000). Variation in stereotypic behaviour related to restraint in circus elephants. Zoo Biology **19**: 209-221.
3. Kurt, F. and Garai, M. (2007). The Asian elephant in captivity—A field study. Cambridge University press, New Delhi.
4. Poole, J. and Granli, P. (2009). Mind and Movement: Meeting the Interests of Elephants. In: An elephant in the room: the science and well being of elephants in captivity, (Forthman, D.L., Kane, F. L., Hancocks, D., and Waldau, P.F. eds.) Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Tufts University
5. Poole, J.H. and Moss, C.J. (2008). Elephant sociality and complexity The scientific evidence. In: Elephants and ethics toward a morality of coexistence (Eds: Wemmer, C and Christen, C. A) The John Hopkins University Press, Baltimore. (Accessed online: http://www.elephantvoices.org/index.php?topic=tools&topic2=tools/documents/2_Poole_Moss_Final_7_12_06.pdf)
6. Sivaganeshan, N. and Kumar, A. (1994). Status of feral elephants in the Andaman Islands, India. Salim Ali Centre for Ornithology and Natural History (SACON- Technical Report 1), Coimbatore, India
7. Sukumar, R. (1991). Ecology. In: Eltringham, S.K. (ed.), The Illustrated encyclopaedia of elephants, Salamander Books, U.K.
8. Varma, S. 2008. Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 7-16. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
9. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity—insights and recommendations, In: 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. (S. Varma and D. Prasad, eds.), pp. 54-64. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
10. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 17-53. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

Section 3:
Captive Elephants under Private Ownership in Assam

Executive Summary

During the British period, capture of wild elephants, for use in the Government service, ensured that licenses were granted to individuals for providing elephants of certain measurements to the Department. This led to the practice of maintaining elephants by individuals and they continue keeping elephants to this day in Assam.

Data was collected through observation of animal/s and interviews with personnel/management, representing various aspects of the elephant's life in captivity. The data was grouped under different parameters based on physical/social/managerial/ physiological relevance to the animals. A team of experts rated different parameters important to the welfare of captive elephants and this rating was then used to assess the welfare status of elephants and their handlers

The rating scale from unsuitable conditions to suitable conditions was used to assess the welfare status of captive elephants and their handlers. The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter, defined as Experts' Rating (E-R). Mean Rating (M-R) representing the actual situation existing for the elephant/s was obtained through the ground survey. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm

A total of thirty-one elephants were observed, belonging to different individual owners across Assam. Female elephants accounted for 65% of the observed elephants; age ranged from 5-55 years, and that of males from 22-44 years.

Eighty six percent of the elephants had been captured from the wild; only two elephants were captive born and two elephants had been purchased. M-R was 0.6 implying a deviation of 90% from E-R.

All elephants were working animals: logging/ for use in tourism/ as *koonkie*; only one owner kept his elephant partly as a family tradition and also for use in logging operations. M-R was 3 with a deviation of 68% from E-R.

The elephants were kept in the open, tethered to a tree when not working and the shade was available in the form of trees. M-R for shelter was 0.0 showing a deviation of 94% from E-R.

Water source for the elephants was varied: ponds/ taps/ river/ stream, but all elephants had access to rivers/ streams. River/ stream as the only source, accounted for 38% of all the elephants. Summer bath frequency was twice per day, in winter the elephants were bathed once; Bath duration ranged from 1- 1.5h; scrub materials used was *shau*, hay, coconut husk and stone. M-R was 5 indicating an overall deviation of 37% from E-R.

All the elephants had opportunity for interaction either in the camp or in the forest with wild elephants, or in the work place. Hours of interaction ranged from 1-24 hrs; mean number of individuals per group was 3, ranging from 1-5. M-R was 5 showing a deviation of 34% from E-R.

All the elephants were chained; chain weight ranged from 25-50 kg, size from 0.6-15cms and length from 15-50m. Eighty percent of the elephants were allowed to free range at night. The elephants that were left to range free at night were hobbled/ tied with drag chain; anchor chain was used for two elephants. M-R was 3 with 60% deviation from E-R.

Sixty seven percent of the elephants were described as quiet/ reliable; two female elephants aggressive. None of the elephants exhibited stereotypy; however, 33% of the elephants had run amok. M-R was 5 showing a deviation of 42% from E-R.

Fifty five percent of elephants were used for logging related work only, 24% in logging as well as *Koonkie*; only two elephants were used in tourism/ festivals/ in patrolling in addition to logging. Elephants took part in religious processions/ in inaugural functions of business establishments. M-R was 5 showing a deviation of 40% from E-R.

Ninety three percent of the elephants were allowed to graze/ browse and provided stall feed. Stall feed included various combinations of Horse gram (*Macrotyloma uniflorum*), Banyan stem (*Ficus*), Para grass (*Urochloa mutica*), Rice (milled grains of *Oryza sativa* along with banyan, Banyan leaves along with grams, Boiled paddy, a boiled mixture of rice, grams and soybean (*Glycine max*), mixture of rice, ghee and grams. M-R was 3 showing a deviation of 62% from E-R.

Data was available for five female elephants on the status of female reproductive status. Occurrence of oestrus was recorded for one. Three were exposed to males; one female exposed to wild males also. None of the females had calved. M-R was 3 with a deviation of 54% from E-R.

One adult male was not reproductively active; this male and another had not sired offspring. All elephants were reported to exhibit musth. All elephants, except one, were aggressive/ unpredictable during musth; two elephants had killed during this period. Musth elephants were isolated, chained and watered, feed was reduced. M-R was 3 with a deviation of 62.5% from E-R.

Occurrence of gastro-intestinal disorders, parasites, abscesses, lameness, toe nail cracks, anemia was reported; left foreleg was fractured for an adult female. A 46y old female was suspected to have contracted Tuberculosis and was undergoing treatment. M-R was 5 with a deviation of 43% from E-R.

All observed elephants had access to a veterinary doctor; experience with elephants ranged from 5 – 20 years. Frequency of visits ranged from “on call” to annually. None of the owners (N = 5) maintained records. M-R was 4 implying a deviation of 49% from E-R.

Mean age of handlers was 35 years, ranging from 22- 46 years. Experience in this profession ranged from 2 months to 32 years, with four of the seven handlers having more than 15y experience. All handlers used tools, *Khukri*, *gupti* (foot-length goad with small metal tip at one end), stick, wooden ankush, and bamboo stick. M-R was 5 with a deviation of 42.7% from E-R.

Salary drawn ranged from Rs.12,000/- to 24,000/- annually and Insurance cover was not available for any of the observed handlers. All, except one, consumed alcohol occasionally/ regularly, after work. M-R was 3 implying a deviation of 59% from E-R.

Overall M-R was 4.0 showing an overall deviation of 50% from E-R. Deviations of 50% or more from E-R accounted for 49% of the occurrences implying nearly half of the observed parameters deviated to this extent from the norms prescribed by experts.

Introduction

During the British period capture of wild elephants for use in the Government service, ensured that licenses were granted to individuals for providing elephants of certain measurements to the Department (Sanderson, 1879). The captured elephants, if not accepted by the British Government, belonged to the licensee. This may have led to the practice of maintaining elephants by individuals. The presence of elephants with private owners has continued to this day in Assam.

Objective

Conditions in captivity may vary across owners, with some or all features being suitable or otherwise to the elephants. This report aims to:

- Assess the welfare status of elephants by considering the physical, social, psychological and reproductive features of captivity
- Assess the veterinary care provided to the elephants
- Handlers are an essential feature of captive elephants' management systems. Hence, their professional experience and socio-economic status has been reviewed.

Method

Elephants in captivity cannot be considered to be domesticated as they have not been bred selectively and new individuals are added by capture from the wild. Hence, their needs can be comparable with the ecological and biological features characteristic of wild elephants. Ferrier (1947) states the need for providing natural conditions in captivity to ensure that the elephants' health is maintained.

The welfare status of captive elephants has been assessed by comparing a range of features in captivity with those the experienced by their counterparts in the wild. The comparison has been made possible by a rating scale developed by a team of experts (from different fields). The greater the deviation from the norms prescribed, the poorer is the welfare. Data on elephants and handlers was obtained through observation and interview of relevant personnel.

Rating method

The rating scale from zero (unsuitable conditions) to ten (suitable conditions) was used to assess the welfare status of captive elephants and their handlers. Experts (both wild and captive elephant specialists, wildlife veterinary experts, managers from protected areas, managers responsible for both wild and captive elephants and other wildlife, personnel from welfare organisations and elephant handlers) were invited to assess the welfare based on different parameters and their significance through an exclusive workshop conducted on the subject (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). Experts rated a total of 114 welfare parameters covering major aspects of captivity.

- The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter. For example mean expert rating of 8.0 (SE= 0.5, N=29) for a parameter 'floor' and 9.0 (SE=0.4, N=31) for 'source of water' was arrived at from the ratings suggested by each expert by averaging across all the experts' values.

- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e., for a parameter with 8.0 as the maximum value, only 2.0 (25%) deviation and parameter with maximum value 9.0, only 1.0 or 10% from the prescribed norm is considered acceptable.
- For example, if an elephant is exposed only to natural flooring, the animal receives a rating of 8 and for entirely unnatural flooring the value is 0; if animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 2.25 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 1.125 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5. This rating is then averaged across all individuals in that institution to get a Mean Rating (M-R) for that feature. Thus M-R represents the actual situation existing for the elephant/s.
- Therefore, using the maxima given by experts as a base, a rating scale starting from zero to the particular maximum value for that parameter has been used and the data for each animal was collected, in a given regime (for example, forest camp or temple).
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. The variables have been termed sub-parameters. For example, the variables shelter type, shelter size, floor type in the shelter; all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. The Mean Rating (M-R) for a parameter is the mean of M-Rs across related sub-parameters and denotes welfare status of existing conditions on the ground for the particular parameter.
- The number of such related parameters (sub-parameters) varies for each regime.
- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percent) indicates deviations from the prescribed norm.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate the professional/ socio-economic status of value to the handler and his elephant.
- N* refers to number of sub-parameters observed. N refers to number of individuals

Result

Population Status

A total of thirty-one elephants were observed, belonging to different individual owners across Assam. Female elephants accounted for 65% of the observed elephants (Figure 1); age ranged from 5-55 yrs, and that of males from 22-44 yrs.

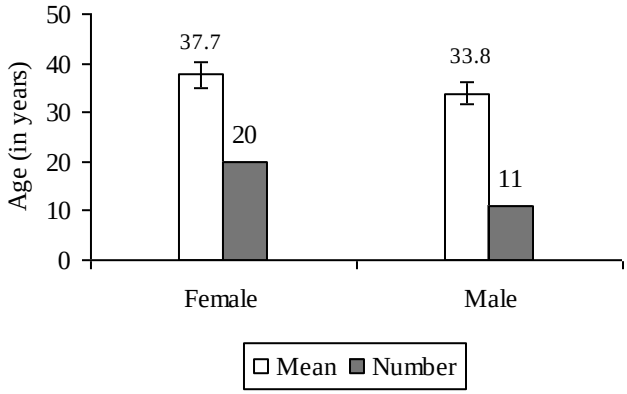


Figure 1: Mean age and numbers of male and female elephants

Source

Elephants undergo a drastic change when they captured from the wild and subjected to captive conditions. Even among captive born elephants, any translocation across locations/ owners will involve a new and unknown environments, leading to an altered lifestyle. This causes stress among the animals and consequent poor welfare.

- 86% of the elephants (N= 28) had been captured from the wild; Figure 2 shows the numbers caught from 1950 to 1990 (this represents the numbers caught and presently owned by private owners)

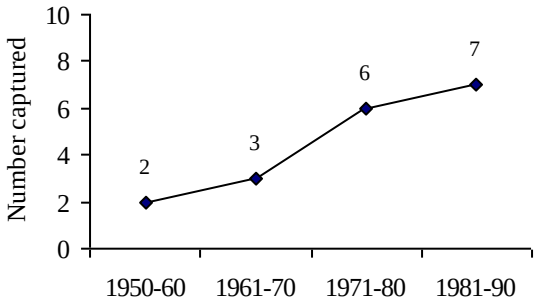


Figure 2: Number of wild caught elephants with private owners

- Only two elephants (both females) were captive born
- The remaining two elephants had been purchased (previous history regarding source of these elephants not known)

M-R was 0.6 (SE= 0.0.3, N= 28) implying a deviation of 90% from E-R.

Purpose of keeping

The reason for maintaining elephants can be considered to be an indicator of the living conditions: maintaining purely for revenue generation may over-ride considering the needs of the animals.

- All elephants were working animals: logging/ for use in tourism/ as *koonkie*; only one owner kept his elephant partly as it was a family tradition and also for use in logging operations

M-R was 2.5 (SE= 0.2, N= 29) with a deviation of 68% from E-R.

Mahout change

When handlers are changed often, it involves a period of adjustment for both the elephant as well as the handler. Hence, the trust or bond between handler and animal is broken. This would result in added stress for the animals.

- Mean number of handlers per elephant was 4.0 (SE= 4.0, N= 21)
- The number of handlers changed per elephant ranged from 2- 10

M-R was 1.5 (se= 0.3, N= 21) with a deviation of 81% from E-R.

Shelter

Wild elephants have been observed to cover vast distances as part of their home range— 250-1000km^2 (Sukumar, 2006), implying the ability of the elephants to make use of physical space.

- The elephants were kept in the open, tethered to a tree when not working
- Shade was available in the form of trees

M-R for shelter type was 0.0 (SE= 0.0, N= 31) showing a deviation of 94% from E-R.
M-R for shade type was 0.7 (SE= 0.0, N= 31) with a deviation of 90% from E-R.

Water

Insufficient/ contaminated water sources can result in ill-health for captive elephants.

- Water source for the elephants was varied: ponds/ taps/ river/ stream, but all elephants had access to rivers/ streams
- River/ stream as the only source accounted for 38% (N= 29) of all the elephants
- Distance to water source varied from within reach to more than 2kms
- Water quality tests were not done by any of the owners
- Summer bath frequency was twice per day, in winter the elephants were bathed once; Bath duration ranged from 1- 1.5h; scrub materials used were *shau*, hay, coconut husk and stone

M-R was 5.1 (SE= 1.0, N*= 8) indicating an overall deviation of 37% from E-R. Figures 3a and 3b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

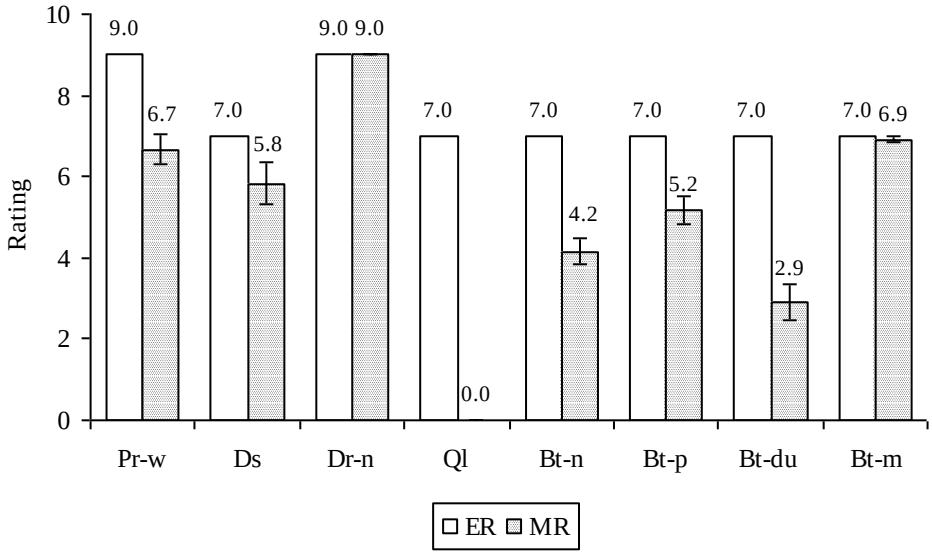
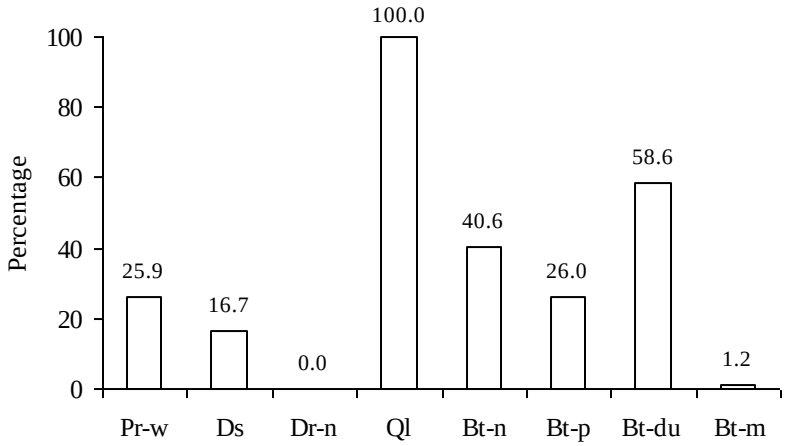


Figure 3a: Comparison of E-R and M-R for 'water' sub-parameters



Pr-w: Perennial source of running water Ds: Distance to water source
Dr-n: Number of times drinking water Ql: Water quality tests Bt-n: Bathing number of times/day
Bt-p: Bathing place Bt-du: Bath duration Bt-m: Bathing materials

Figure 3b: Percentage wise deviation from E-R for 'water' sub-parameters

Sleeping place

Unsuitable surfaces or confined spaces while sleeping will not only be a source of discomfort in the short term but also cause health problems through skin abrasions/ application of prolonged pressure on one area only.

- For 85% of the elephants (N= 27), the tethering site/ camp was also the sleeping place
- Only two elephants were given opportunity to sleep in the nearby forest

M-R was 4.2 (SE= 0.2, N= 26) showing a deviation of 47% from E-R for this single sub-parameter.

Walk

Absence of exercise for captive elephants has resulted in foot problems, ultimately resulting in systemic infections and death (Olson, et al., 1994).

- All the elephants were given opportunity to walk
- Nature of terrain was hilly/ forests/ plain with only one elephant walked on concrete roads
- Distance covered varied from 1-40kms, duration ranged from 1-5h/day

M-R was 4.1 (SE= 2.0, N*= 3) with a deviation of 49% from E-R. Figures 4a and 4b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

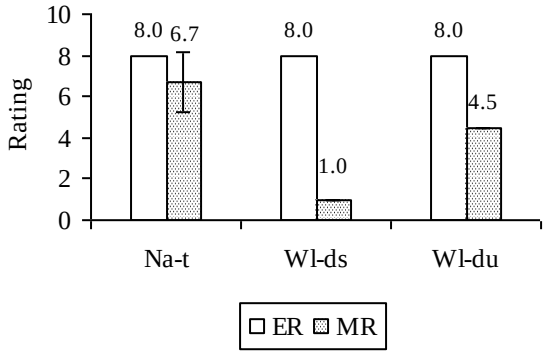
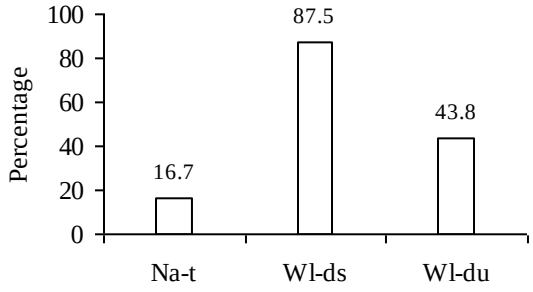


Figure 4a: Comparison of E-R and M-R for 'walk' sub-parameters



Na-t: Nature of terrain Wl-ds: Distance covered Wl-du: Walk duration

Figure 4b: Percentage wise deviation from E-R for 'walk' sub-parameters

Social interaction

Interaction among elephants covers a range of methods: auditory, tactile, olfactory and visual, all employed in efforts to communicate with other individuals. Its absence in captive elephants can have serious behavioural/ health consequences.

- All the elephants had opportunity for interaction either in the camp or in the forest with wild elephants, or in the work place
- Hours of interaction ranged from 1-24h; mean number of individuals per group was 3, ranging from 1-5
- Distance between individuals varied from within reach to 70m

M-R was 5.3 (SE= 1.5, N*= 4) showing a deviation of 34% from E-R. Figures 5a and 5b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

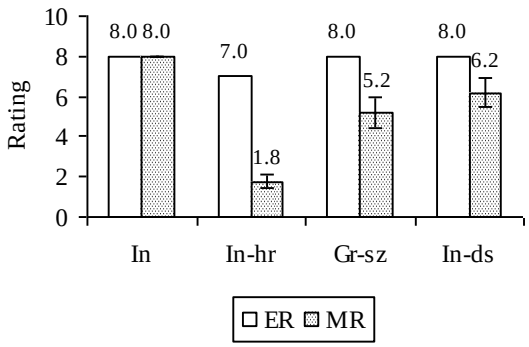
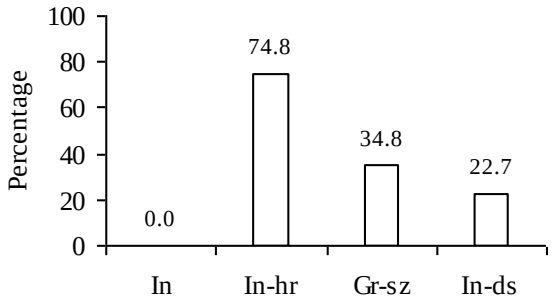


Figure 5a: Comparison of E-R and M-R for 'interaction' sub-parameters



In: Opportunity for interaction In-hr: Hours of interaction Gr-sz: Group size
In-ds: Interaction distance

Figure 5b: Percentage wise deviation from E-R for 'interaction' sub-parameters

Chaining

Use of chains as a means of control is a universal practice in captive elephant management. This practice, if not restricted as an emergency measure/ for veterinary procedures, can be an effective deterrent in performance of species-typical behaviours.

- All the elephants were chained; chain weight ranged from 25-50kgs, size from 0.6-15cms and length from 15-50m
- 80% of the elephants (N= 25) were allowed to free range at night

- The elephants that were left to range free at night were hobbled/ tied with drag chain; anchor chain was used for two elephants.

M-R was 3.2 (SE= 2.5, N*= 3) with 60% deviation from E-R. Figures 6a and 6b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

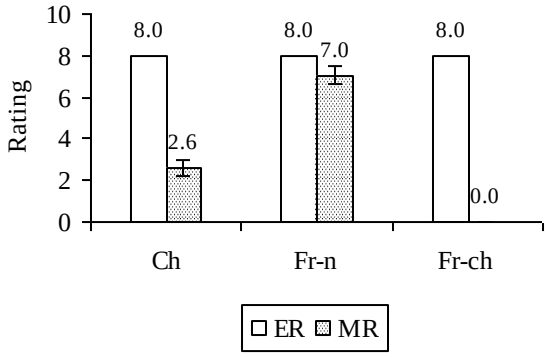
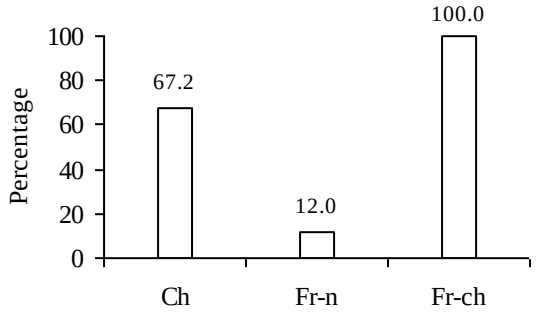


Figure 6a: Comparison of E-R and M-R for 'chaining' sub-parameters



Ch: Chaining status Fr-n: opportunity to free-range at night Fr-ch: Chain type while free-ranging

Figure 6b: Percentage wise deviation from E-R for 'chaining' sub-parameters

Observed behaviour

Elephants that are quiet/ calm can be handled more easily than those which are unpredictable. Poor living conditions can also result in development of stereotypic behaviours.

- 67% of the elephants (N= 27) were described as quiet/ reliable; two female elephants aggressive;
- None of the elephants exhibited stereotypy
- 33% (N= 15) of the elephants had run amok

M-R was 4.7 (SE= 1.9, N*= 4) showing a deviation of 42% from E-R. Figures 7a and 7b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

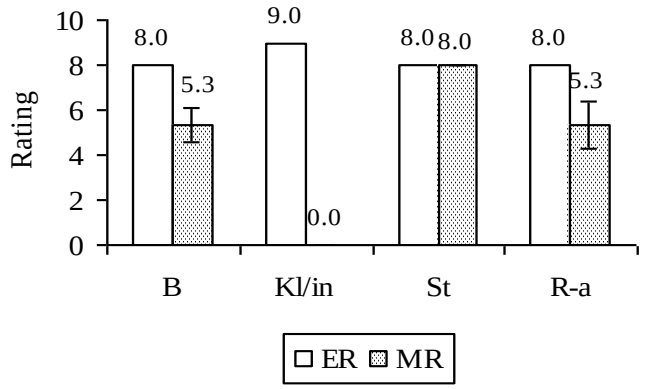
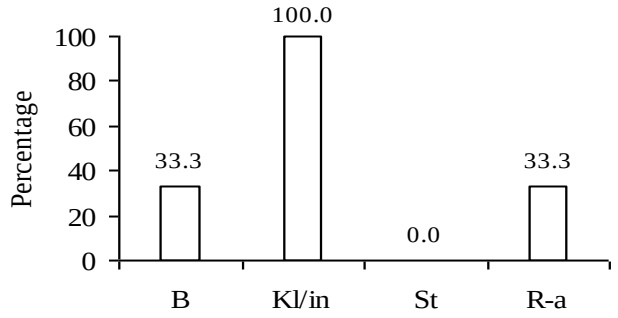


Figure 7a: Comparison of E-R and M-R for behaviour sub-parameters



B: Behaviour (Temperament) Kl/in: Incidents of killing/ injury St: Occurrence of stereotypy
R-a: Incidents of running amok

Figure 7b: Percentage wise deviation from E-R for behaviour sub-parameters

Work

Work is one of the reasons for the continued maintenance of elephants in captivity. This may involve activities natural/ alien to an elephant's behaviour, in conditions with varying provisions of shade/ rest/ food while working.

- 55% of elephants (N= 29) were used for logging related work only, 24% in logging as well as *Koonkie*; only two elephants were used in tourism/ festivals/ in patrolling in addition to logging; no major work was given for two female elephants (40y and 5y)
- Only two elephants (a male and a female) took part in religious processions/ in inaugural functions of business establishments
- Work timings ranged from 6a.m. to 9a.m./ 7a.m. to 10a.m./ 8a.m. to 10.30a.m./ 10a.m. to 12noon and 3p.m. to 4p.m.; *Koonkies* were worked at night
- Mean age when elephants began work was 9y, ranging from 7-17y
- Number of working days was 20-24 days per month

- Shade was available for 79% of the elephants (N= 19); only one elephant did not have access to water; rest was given for all elephants while working; food was not provided for 83% of the elephants during work (N= 18)

M-R was 4.8 (SE= 1.7, N*= 5) showing a deviation of 40% from E-R. Figures 8a and 8b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

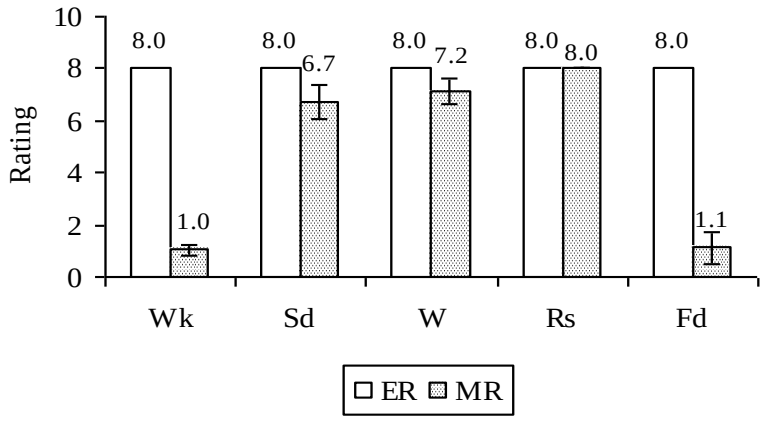
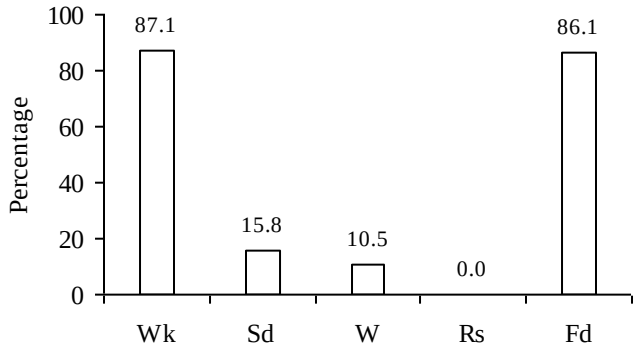


Figure 8a: Comparison of E-R and M-R for 'work' sub-parameters



Wk: Work type Sd: Shade availability W: Water availability Rs: Rest availability Fd: Food availability

Figure 8b: Percentage wise deviation from E-R for 'work' sub-parameters

Food

Allowing elephants to browse/ graze not only provides opportunity to exercise but also helps in learning to forage in the wild.

- Ninety three percentages of the elephants (N= 27) were allowed to graze/ browse and provided stall feed
- Stall feed included various combinations of Horse gram (*Macrotyloma uniflorum*), Banyan stem (*Ficus*), Para grass (*Urochloa mutica*), Rice (milled grains of *Oryza sativa*

along with banyan, Banyan leaves along with grams, Boiled paddy, a boiled mixture of rice, grams and soybean (*Glycine max*), mixture of rice, ghee and grams,

- 36% of the elephants (N= 25) were given mineral mixture
- Ration chart was not used for any of the elephants

M-R was 3.4 (SE= 2.0, N*= 4) showing a deviation of 62% from E-R. Figures 9a and 9b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

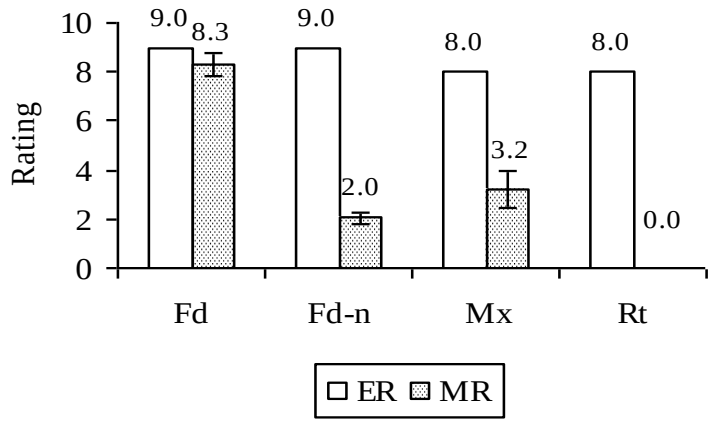
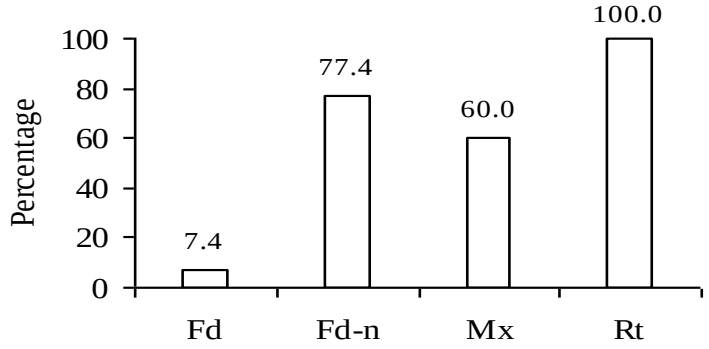


Figure 9a: Comparison of E-R and M-R for 'food' sub-parameters



Fd: Food provisioning type Fd-n: Number of food items Mx: Mineral mix given
Rt: Usage of ration chart

Figure 9b: Percentage wise deviation from E-R for 'food' sub-parameters

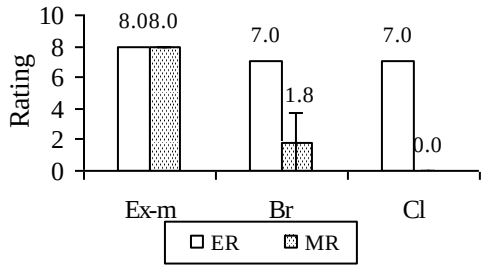
Reproductive status

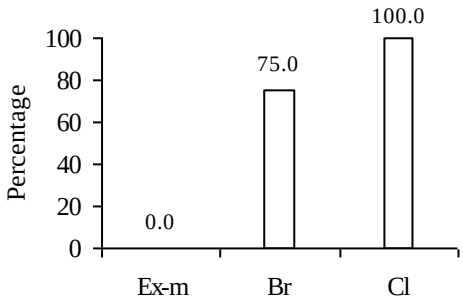
Normal reproductive functioning in captive elephants is subject to a number of biological factors and husbandry practices: poor captive conditions resulting in ill-health/ stress, absence of individuals of opposite sex, restriction on movement due to chaining contribute to reproductive failure.

Female reproductive status

- Data was available for five female elephants: oestrus occurrence was recorded for one
- Three were exposed to males; one female exposed to wild males also
- None of the females had calved

M-R was 3.3 (SE= 3.0, N*= 3) with a deviation of 54% from E-R. Figures 10a and 10b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.





Ex-m: Exposure to males Br: Opportunity to breed Cl: Calf birth

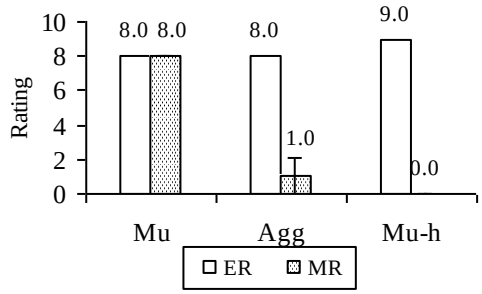
Figure 10a: Comparison of E-R and M-R for female reproductive status

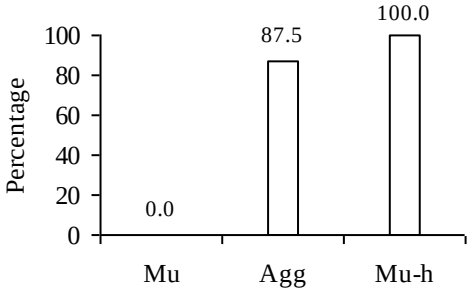
Figure 10b: Percentage wise deviation from E-R for female reproductive status

Male reproductive status

- One adult male was not reproductively active; this male and another had not sired offspring
- All elephants for which relevant data was collected were reported to exhibit musth (N= 6)
- All elephants, except one, were aggressive/ unpredictable during musth; two elephants had killed during this period
- Musth elephants were isolated, chained and watered, feed was reduced

M-R was 3.0 (SE= 3.1, N*= 3) with a deviation of 62.5% from E-R. Figures 11a and 11b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.





Mu: Occurrenc of musth Agg: Aggression during msuth Mu-h: Handling of msuth

Figure 11a: Comparison of E-R and M-R for male reproductive status

Figure 11b: Percentage wise deviation from E-R for male reproductive status

Health status

Captive conditions may predispose elephants to a number of health problems such as prevalence of foot problems (Mikota et al., 1994), excessive weight or malnourishment, etc.

- Occurrence of gastro-intestinal disorders, parasites, abscesses, lameness, toe nail cracks, anemia was reported; left foreleg was fractured for an adult female
- Deworming was done once in 6 months
- Of six elephants for which data was available, three were not immunized
- Oiling was not done for all
- Blood/ urine/ dung samples were tested for all except one elephant
- A 46y old female was suspected to have contracted Tuberculosis and was undergoing treatment.

M-R was 4.6 (SE= 1.3, N*= 6) with a deviation of 43% from E-R. Figures 12a and 12b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

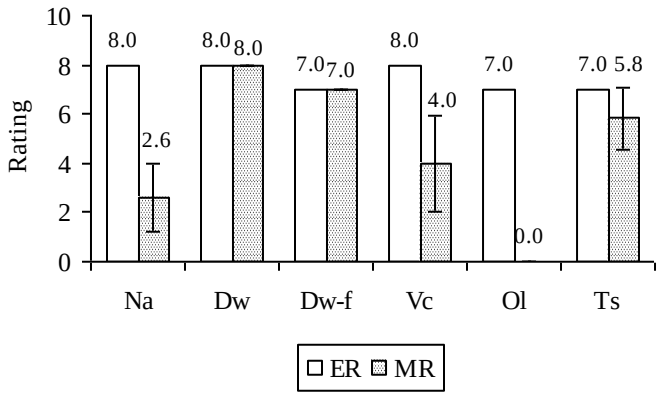
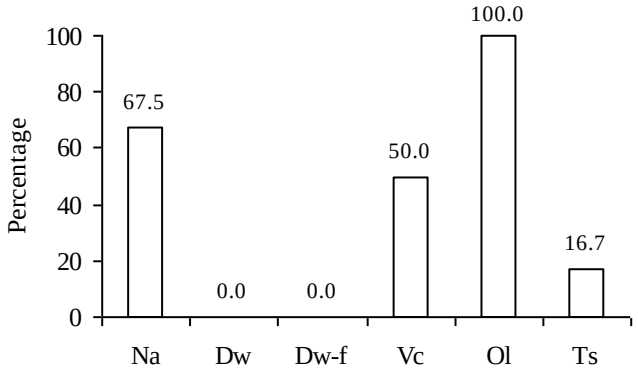


Figure 12a: Comparison of E-R and M-R for 'health' sub-parameters



Na: Nature of disease/ injury Dw: Deworming done Dw-f: Frequency of deworming
Vc: Vaccination done Ol: Oiling done Ts: Tests of blood/ dung/ urine samples

Figure 12b: Percentage wise deviation from E-R for 'health' sub-parameters

Veterinary personnel and infrastructure

A key to maintenance of health of captive elephants is the availability of veterinary personnel with relevant experience. Poor infrastructure can be a major impediment in the smooth functioning of the institution/ management system.

- All observed elephants (N= 6) had access to a veterinary doctor; experience with elephants ranged from 5y – 20y
- Frequency of visits ranged from "on call" to annually
- Except one, all elephants (N = 5) did not have access to a veterinary assistant
- None of the owners (N = 5) maintained records

M-R was 4.1 (SE= 1.6, N*= 6) implying a deviation of 49% from E-R. Figures 13a and 13b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

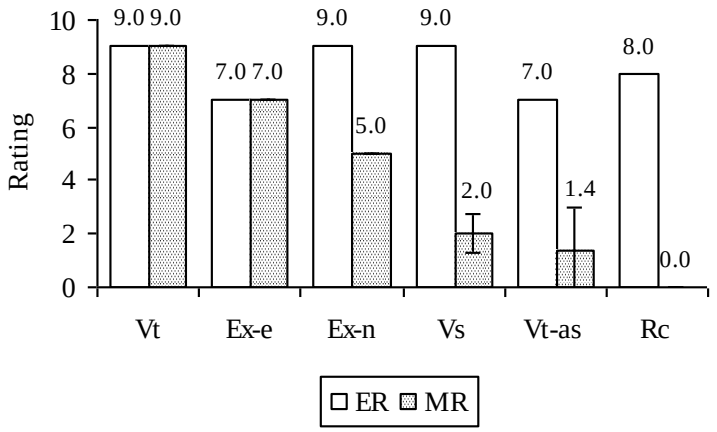
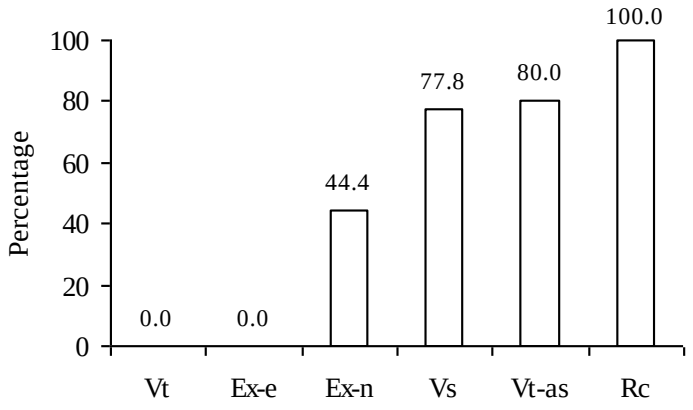


Figure 13a: Comparison of E-R and M-R for 'veterinary personnel' sub-parameters



Vt: Availability of veterinary doctor Ex-e: Experience with elephants Ex-n: Number of years of experience Vs: Frequency of visits Vt-as: Veterinary assistant availability Rc: Maintenance of records

Figure 13b: Percentage wise deviation from E-R for 'veterinary personnel' sub-parameters

Handler status
Mean age of handlers was 34.8yrs, ranging from 22- 46yrs (N= 7).

Professional experience
Poor experience in handling elephants can be dangerous to the animal as well as the handler or general public.

- Experience in this profession ranged from 2 months to 32y, with four of the seven handlers having more than 15y experience
- Experience with specific elephant ranged from 1.5 months to 20y, with four of the seven handlers having less than five years experience
- Of the seven, five handlers had opted for this profession as a source of employment
- Number of hours spent with elephant ranged from 6- 11h
- All handlers used tools, *Khukri*, *gupti* (foot-length goad with small metal tip at one end), stick, wooden ankush, bamboo stick

M-R was 5.2 (SE= 1.5, N*= 4) with a deviation of 42.7% from E-R. Figures 14a and 14b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

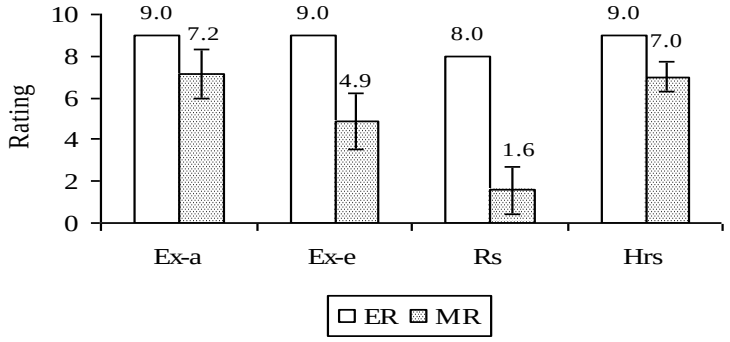
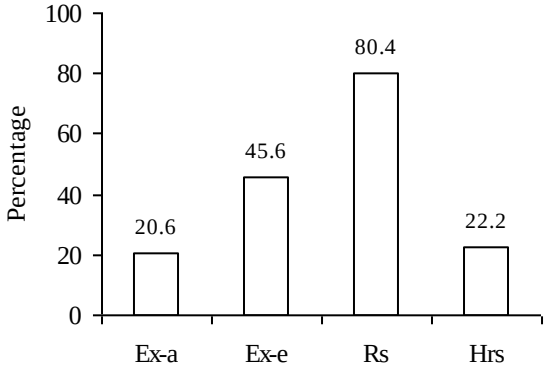


Figure 14a: Comparison of E-R and M-R for 'professional status' sub-parameters



Ex-a: Experience as % of handler ageEx-e: Experience as % of elephant age
Rs: Reason for choosing this profession Hrs: Number of hours spent with elephant

Figure 14b: Percentage wise deviation from E-R for 'professional status' sub-parameters

Socio-economic status

- Of the five handlers, three had relatives working in the same field; three mentioned farming as a family occupation
- Education ranged from class 4th to 6th, with three of the seven handlers not being educated
- Salary drawn ranged from Rs.12,000/- to 24,000/- annually
- Number of children per family ranged from none to three
- Languages known varied from 1-2
- Insurance cover was not available for any of the observed handlers
- Of the interviewed handlers (N= 7), all, except one, consumed alcohol occasionally/ regularly, after work

M-R was 2.9 (SE= 0.7, N*= 9) implying a deviation of 59% from E-R. Figures 15a and 15b give the comparative rating and Percentage of deviation, respectively, for each of the sub-parameters.

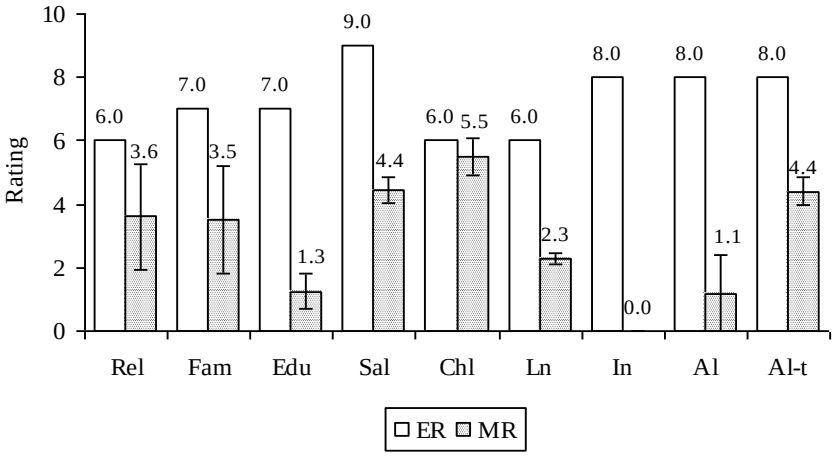
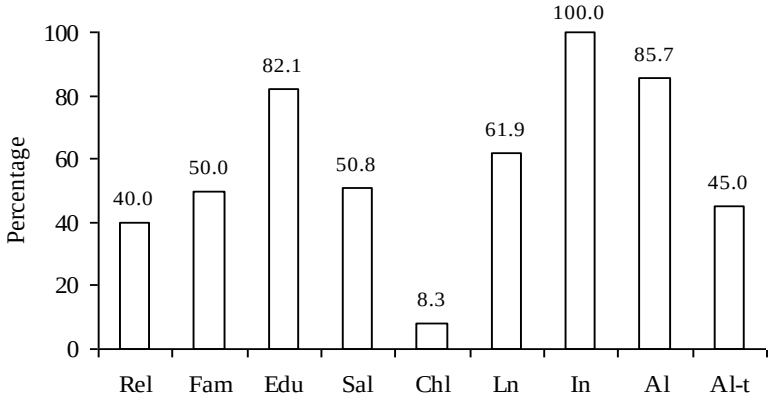


Figure 15a: Comparison of E-R and M-R for 'socio-economic status' sub-parameters



Rel: having relatives in this profession Fam: Family occupation Edu: Education level Sal: Salary drawn Chl: Number of children Ln: Languages known In: Insurance availability Al: Alcohol consumption
Al-t: Timings of alcohol consumption

Figure 15b: Percentage wise deviation from E-R for 'socio-economic status' sub-parameters

Overall welfare status

Overall M-R, considering all observed parameters together, was 4.0 (SE= 0.4, N*= 55) showing an overall deviation of 50% from E-R. Figure 16 gives the distribution of Percentage of deviation from E-R across the parameters observed. Deviations of 50% or more from E-R accounted for 49% of the occurrences implying nearly half of the observed parameters deviated to this extent from the norms prescribed by experts.

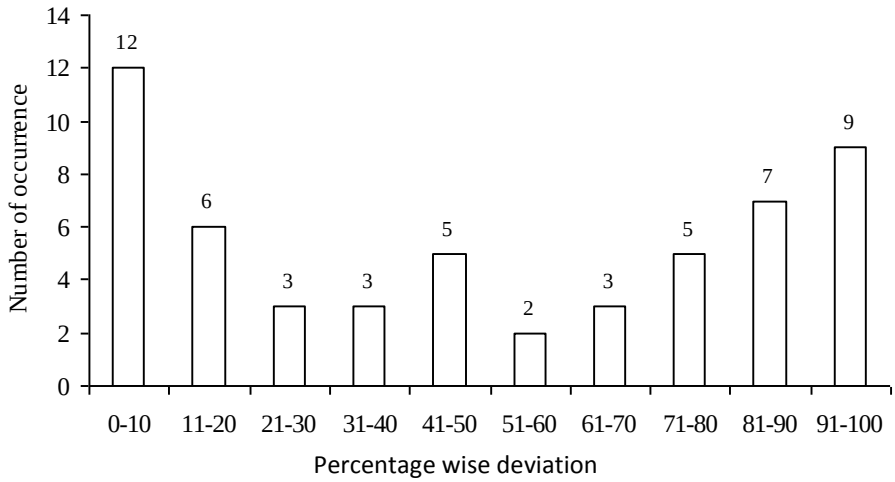


Figure 16: Distribution of Percentage wise deviation from E-R across all parameters

Discussion

The knowledge gained from studies on wild elephants has given a baseline with which to compare the living conditions of captive elephants. Deviations in the biological and ecological conditions experienced in the wild will create a deficiency in meeting the needs of captive elephants.

Features showing 50% or more deviation:

- Most of the elephants were captured from the wild: making them undergo far greater changes in their living conditions in captivity
- The occurrence of natural forest conditions was nullified by tethering the elephants to an area determined by the chain length, thereby effectively restricting performance of species-specific activities such as foraging/ socializing/ walking, etc.
- The activity of walking on suitable substrates (Olson, et al., 1994) is important for captive elephants considering their feet structure. This activity was determined by the work schedule, subjecting the elephants to durations/ distances unlike those performed in the wild
- The maintenance of social relationships across generations of female elephants has been documented (Pool and Moss, 2008). For these elephants, their social structure and relationships were subject to human control: either broken when the elephant was sold/ shifted to a different owner or disrupted by work schedules
- Foraging in natural forest conditions was restricted as the elephants were hobbled/ tied with a drag chain

- Logging operations can be physically exhausting depending on the duration of work and quantity of load carried as pointed in a study (Saseendran, et al., 2009). One of the elephants, a 24y old male, had reportedly injured its tusk following logging work. Another, a 45y old female, had a fracture sustained while working.
- None of the observed females had calved; the observed males had not sired offspring. This will impact the wild population considering that 86% of these elephants have been captured from the wild.
- Immunization of elephants was not uniformly practiced across all owners; records were not maintained

The all encompassing feature of elephants with private owners was the influence of work on their daily activity and opportunities available for expression of natural behaviours by the elephants. Beginning with source of the elephant, where mother-offspring could be separated before reaching adulthood, the animals were traded with a purpose in view: to be used for work or to generate income. The needs of the elephants were secondary to those of the people owning/ using the elephants.

Handler status

- The number of mahouts changed per elephant and the relatively low experience of a handler with his elephant indicates change of handlers. This may cause stress for both elephant and handler as each goes through a period of learning.
- All handlers used more than one form of tool to control his elephant
- Salary paid to the mahouts/ cawadis was low, insurance cover was not available
- Alcohol consumption was prevalent among the mahouts/ cawadis

Reference

1. Ferrier, A.J. (1947). Care of Elephants in Burma. London, Messrs. Steel Brothers Co. Ltd
2. Mikota, S.K., Sargent, E.L., and Ranglack, G.S. (1994). The Musculoskeletal system, In: Medical management of the elephant. Indira Publishing House, U.S.A., p:137-150
3. Olson, D., Keele, M. and Tuttle, D. (1994). Husbandry and management, In: Medical management of the elephant (Mikota, S.K., Sargent, E.L. and Ranglack, G.S. eds.), Indira Publishing House, U.S.A., p:27-31
4. Poole, J.H. and Moss, C.J. (2008). Elephant sociality and complexity The scientific evidence. In: Elephants and ethics toward a morality of coexistence (Eds: Wemmer, C and Christen, C. A) The John Hopkins University Press, Baltimore. (Accessed online: http://www.elephantvoices.org/index.php?topic=tools&topic2=tools/documents/2_Poole_Moss_Final_7_12_06.pdf).
5. Sanderson, G.P. (1879). Thirteen years among wild beasts in India. W.H.Allan, London.
6. Saseendran, P.C., Anil, K.S., Anilkumar Nair and Prasad, A. (2009). Elephants and work In: Healthcare Management Of Captive Asian Elephants (G. Ajitkumar, G., Anil, K. S., Alex, P. C. and Rajeev, T.S., Eds.) Kerala Agricultural University

Elephant Study Centre, Faculty of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala, India

7. Sukumar, R. (2006). A brief review of the status, distribution and biology of wild Asian elephants *Elephas maximas*. International Zoo Yearbook 40: 1-8.
8. Varma, S. 2008. Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 7-16. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
9. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity— insights and recommendations, In: 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. (S. Varma and D. Prasad, eds.), pp. 54-64. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
10. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 17-53. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

Section 4:
Captive Elephants under Private Ownership in Bihar

Executive Summary

The region of present day Bihar may have been host to elephant trade many centuries ago, an economic practice that continues to this day during the annual Sonepur Mela. The custom of owning elephants by landlords in Bihar is considered to be representative of social status.

Welfare status of captive elephants was assessed by comparing captive living conditions with those observed in the wild. This was done by a system of rating the existing conditions in terms of its suitability to the elephants. The rating scale ranged, developed by experts, ranged from suitable to unsuitable conditions for the elephants/ handlers.

The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter, defined as Experts' Rating (E-R). Mean Rating (M-R) representing the actual situation existing for the elephant/s was obtained through the ground survey. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm

Data was collected through observation and interview of relevant personnel on ten elephants (9 males, 1female), each belonging to different owners. Conditions in captivity for elephants with these owners were studied. Mean age of males was 23 years and the single female was 30 year old.

Information available for such elephants suggests that all were purchased. Sonepur Mela was cited as the source of purchase for two males. Age at purchase/ transfer/gifting ranged from 2-30 years for males; for the female it was 8 years. M-R was 2 showing a deviation of 75% from E-R.

All elephants were kept as a symbol of social status; natural conditions such as appropriate physical features (land, vegetation)/ability to perform species-typical activities were absent. M-R was 1 with a deviation of 87.5% from E-R.

All the elephants were provided "covered-type" of shelters. Shelter size varied from 20' X 20' to a maximum of 50' X 50'. The elephants were kept in this place for 16-24 hrs. The shelter was cleaned daily for nine of the elephants and once in 2-3days for another; disinfectants, broom/ water was used. M-R was 3 with a deviation of 62.9% from E-R.

Only one elephant had access to river as the sole source of water; the remaining elephants had access to river/ ponds/ tap water. Tap water was available within the shelter; distance to river ranged from 0.5-2kms from the shelter. Bathing place was river/pond/ shelter, bath duration was 1-2h; bathing materials used were brush, medicated soap; no scrub was used for one elephant. M-R was 4 with a deviation of 55.8% from E-R.

None of the elephants investigated were given any opportunity for social interaction. M-R was 0.0 with complete (100%) deviation from E-R.

All the elephants were chained with a plain type chain; two male elephants (one 35y old and another 26y old) were chained using spiked chains. All the elephants were reported to be

chained all the time. Hobbles were used for two, a 3 and a 35 years old, elephants. M-R was 0.9 with a deviation of 88% from E-R.

Except for two adult males, all elephants were described as calm/quiet. The two adult males (26 year and 35 year) were reported to be "rough" with one of the males having injured its mahout. None of the elephants exhibited stereotypy. M-R was 7 indicating a deviation of 9.5% from E-R.

Except for a 35 year old male, none of the elephants was used for work. The lone working elephant was used in functions such as marriages or other social occasions; time of work was in the evening for duration of 4-5 hrs; the elephant was initiated into work when it was aged 7 years. M-R was 7 indicating a deviation of 10% from E-R.
Except for a male, all elephants were given only stall feed; the elephant allowed to browse/graze did so within a farmland. Stall feed included leaves, rice (milled grains of *Oryza sativa*), paddy (unmilled grains of *Oryza sativa*), wheat (milled grains of *Triticum aestivum*), Sugarcane (*Sacharum* sp.), Jaggery (unrefined, concentrated product of sugarcane juice). M-R was 3 showing a deviation of 61.7% from E-R.

The single adult female elephant was reproductively inactive. None of the adult males were reproductively active. Musth was reported for a single adult male. M-R for reproductive activity of elephants was 0.0 showing complete (100%) deviation from E-R. M-R

There was no information on the diseases or injuries sustained by the elephants. Oil (Mustard/ coconut oil) was applied in the head region after bathing the elephants. M-R for health status was 5 with a deviation of 37.5% from E-R.

Sixty six percent of the elephants did not have access to veterinary doctors. Two of the three, doctors available had no experience in treating elephants. Frequency of visits was dependent on calls by owners, only one doctor was said to visit weekly. Maintenance of medical records was not observed. M-R was 2 showing a deviation of 75.4% from E-R.

Mean age of handlers was 38 years, ranging from 22-50 years. None of the handlers came from a background associated with elephant handling. Mean annual salary was Rs9800/-, ranging from Rs.8400 to Rs.12000/-. Insurance cover was not provided for any of the handlers. All handlers used tools: metal ankush, wooden ankush, stick. Handlers consumed alcohol after work hours. M-R was 2 indicating a deviation of 74% from E-R.

Overall M-R, across all observed parameters, was 3.0 showing a deviation of 62.5% from E-R.

Introduction

Prior to 2000, the state of Bihar harbored wild elephants in its protected areas. Post-2000, another state was formed from parts of Bihar and present day Bihar does not account for wild elephants in its sanctuaries (Anon., 2007). In Bihar, however, there is an active culture of keeping elephants as pets and status symbols. They are generally kept by landlords, it is looked upon as an expensive hobby but it has strong commercial overtones. This region is historically known for its trade in elephants- the trade in elephants at Sonepur Mela may have been conducted many centuries ago (Ashraf and Mainkar, 2004).

Objective

The investigation aimed

- To assess the welfare status of captive elephants by considering the existing physical, social, psychological, physiological and health aspects of the elephants
- To assess the socio-economic status of handlers of elephants as they are essential to an elephant-keeping system

Method

The investigation on welfare status of captive elephants was by comparing captive living conditions with those observed in the wild: living conditions included the physical environment, the social and reproductive features as well as health of the elephants. Availability of veterinary care and infrastructure has been considered as they are essential to any captive management system. The biological and ecological needs of captive elephants have not been changed as they cannot be considered to be domesticated, i.e., they have not been selectively bred in captivity.

Thus, their ecological/biological needs do not differ from those of their wild counterparts. Veasey (2006) states the need for captive situations to focus on the behavioural and biological needs of elephants that are essential for the survival and reproduction of the species in the wild. Welfare status has been assessed by rating the existing conditions in terms of its suitability to the elephants. This was done by visiting elephants in three different districts, and observing elephants directly, interacting with elephant owners, mahouts and people associated with elephant keeping.

The rating method

A rating scale from zero (unsuitable conditions) to ten (suitable conditions) was used to assess the welfare status of captive elephants and their handlers. Experts (both wild and captive elephant specialists, wildlife veterinary experts, managers from protected areas, managers responsible for both wild and captive elephants and other wildlife, personnel from welfare organisations and elephant handlers) were invited to assess the welfare based on different parameters and their significance through an exclusive workshop conducted on the subject (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). Experts rated a total of 114 welfare parameters covering major aspects of captivity.

- The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter. For example mean expert rating of 8.0

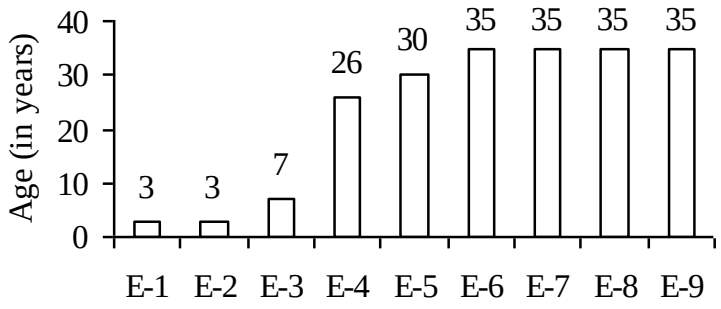
(SE= 0.5, N=29) for a parameter 'floor' and 9.0 (SE=0.4, N=31) for 'source of water' was arrived at from the ratings suggested by each expert by averaging across all the experts' values.

- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e., for a parameter with 8.0 as the maximum value, only 2.0 (25%) deviation and parameter with maximum value 9.0, only 1.0 or 10% from the prescribed norm is considered acceptable.
- For example, if an elephant is exposed only to natural flooring, the animal receives a rating of 8 and for entirely unnatural flooring the value is 0; if animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 2.25 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 1.125 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5. This rating is then averaged across all individuals in that institution to get a Mean Rating (M-R) for that feature. Thus M-R represents the actual situation existing for the elephant/s.
- Therefore, using the maxima given by experts as a base, a rating scale starting from zero to the particular maximum value for that parameter has been used and the data for each animal was collected, in a given regime (for example, forest camp or temple).
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. The variables have been termed sub-parameters. For example, the variables shelter type, shelter size, floor type in the shelter; all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. The Mean Rating (M-R) for a parameter is the mean of M-Rs across related sub-parameters and denotes welfare status of existing conditions on the ground for the particular parameter.
- The number of such related parameters (sub-parameters) varies for each regime.
- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate the professional/ socio-economic status of value to the handler and his elephant.

N* refers to number of sub-parameters observed. N refers to number of individuals

Results

A sample of only ten elephants (or owners) was possible due to inaccessibility, non-co-operation of owners. The small numbers could be offset by the uniformity in keeping methods observed across the owners. Thus, captive conditions may be similar across other elephants with private owners in this state. Mean age of males was 23.2 year (SE= 5.1, N= 9) and the single female was 30 year old. Figure 1 gives age of the male elephants observed.



E: Elephant

Figure 1: Age of observed male elephants

Source

Change of ownership maybe stressful for elephants as it is likely to involve change of locations/ altered daily schedules/ different management styles. Separation of dependent young (male/ female) from their mothers/ related animals can be traumatic (Bradshaw, 2007).

- Information on source was available for four elephants; all were purchased.
- Sonepur Mela was cited as the source of purchase for two males
- Names of previous owners was available for only two of the elephants
- Age at purchase/ transfer/gifting ranged from 2-30y for males; for the female it was 8y
- Among the elephants observed, three were less than 10y old and were maintained singly by each owner

M-R was 1.5 (SE= 0.0, N= 4) showing a deviation of 75% from E-R.

Purpose of keeping

Keeping elephants for symbolic purposes, even when commercial utilization is not a priority, may have negative consequences on the elephants if the needs of the animals are not known to the owner or are not adhered to.

- All elephants were kept as a symbol of social status, except one which was also used for work.
- Natural conditions such as appropriate physical features (land, vegetation)/ ability to perform species-typical activities were absent

M-R was 1.0 (SE= 0.0, N= 10) with a deviation of 87.5% from E-R.

Shelter

Physical living conditions can be considered to be one of the major factors defining welfare of captive elephants. Absence of appropriate substrates, lack of space or vegetation can hinder performance of species-specific activities; elephants cover vast distances across varied terrain as part of their home-range (Sukumar, 2006).

- Types of shelters varied from open (Figures 28a, c and d) to covered (Figure 28b) and maximum elephants were provided “covered-type” of shelters

- Shelter size varied from 20’ X 20’ to a maximum of 50’ X 50’
- The elephants were kept in this place for 16-24h
- Floor types varied among the animal observed, some had mud floor and most of the elephants; even they were kept in open shelter, the floor was concert
- The shelter was cleaned daily for nine of the elephants and once in 2-3days for another; disinfectants, broom/ water was used.
- Although shelters were cleaned daily, animal defecation, urine, food waste and other associated materials (Figures 28e and f) observed around the shelter appeared to be problematic

M-R was 2.9 (SE= 3.3, N*= 3) with a deviation of 62.9% from E-R. Figures 2a and 2b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for shelter sub-parameters.

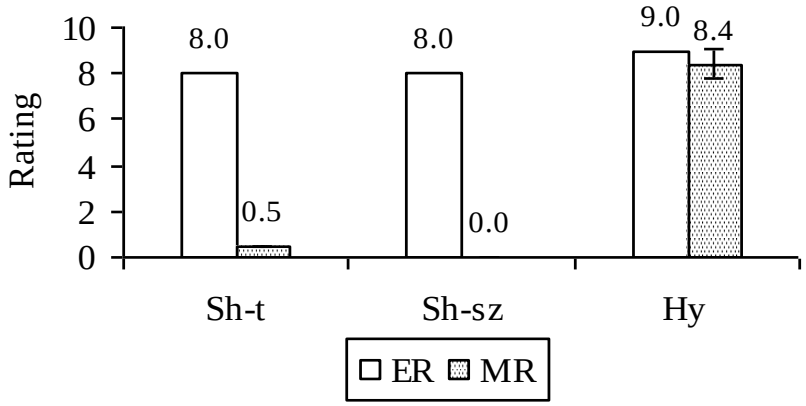
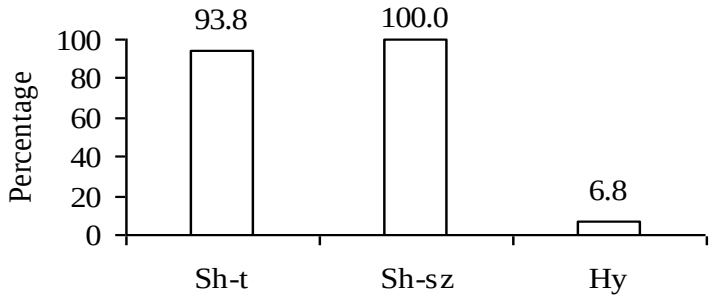


Figure 2a: Comparison between E-R and M-R for shelter sub-parameters



Sh-t: Shelter type Sh-sz: Shelter size Hy: Hygiene maintenance

Figure 2b: Percentage wise deviation from E-R for shelter sub-parameters

Water

For captive elephants, opportunities for engaging in species typical behaviours such as bathing, dust-bathing, wallowing maybe limited or absent due to lack of suitable water sources or other features of captivity.

- Only one elephant had access to river as the sole source of water; the remaining elephants had access to river/ ponds/ tap water
- Tap or tank (Figure 31) water was available within the shelter; distance to river ranged from 0.5-2kms from the shelter
- The elephants consumed water 1-3 times/day
- Bathing place was river/pond/ shelter, bath duration was 1-2h; bathing materials used were brush, medicated soap; no scrub was used for one elephant

M-R was 3.5 (SE= 0.7, N*= 5) with a deviation of 55.8% from E-R. Figures 3a and 3b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for water sub-parameters.

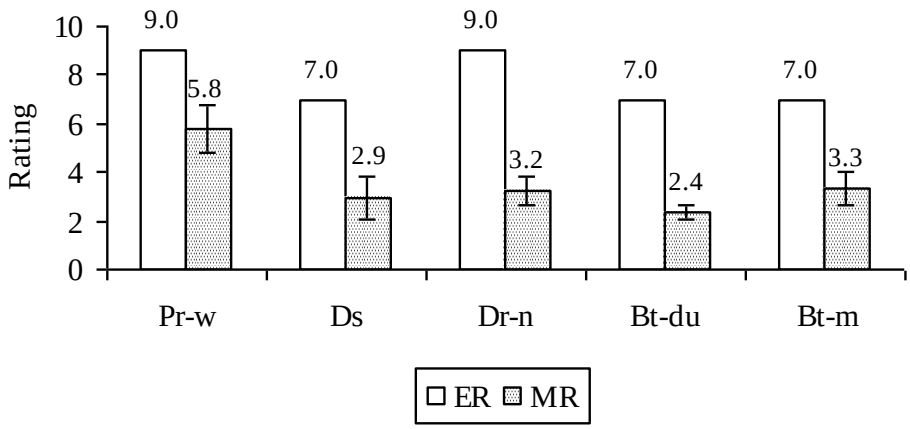
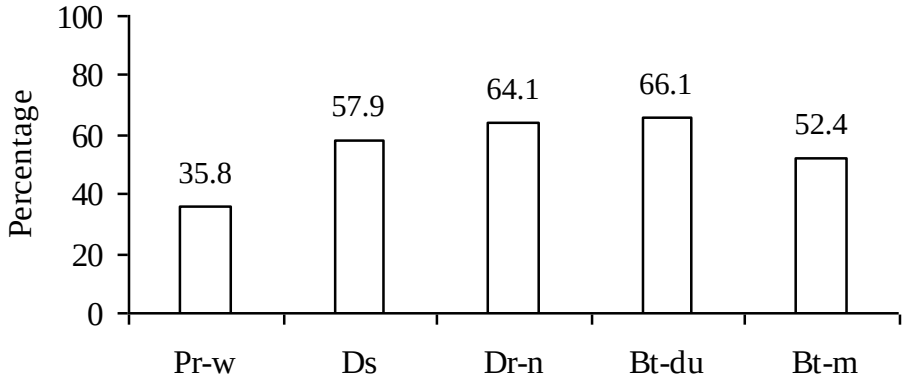


Figure 3a: Comparison between E-R and M-R for water sub-parameters



Pr-w: Perennial source of running water Ds: Distance to water source
Dr-n: Number of times drinking water Bt-du: Bath duration Bt-m: Bathing materials

Figure 3b: Percentage wise deviation from E-R for water sub-parameters

Sleep
Poor sleep conditions or restriction on movement, in captivity, hinders normal sleep patterns resulting in altered sleep duration. Adult elephants were reported to sleep for 3-4h while younger elephants were observed to sleep for 4-6h (Kurt and Garai, 2007).

- Shelter was also the sleeping place for the elephants
- Sleep duration ranged from 5-9h; elephants were observed to sleep during day as well as night

M-R for sleep area was 0.0 (SE= 0.0, N= 7) with a 100% deviation from E-R.
M-R for sleep duration was 0.0 (SE= 0.0, N= 5) with a 100% deviation from E-R.

Walk
Wild elephants are known to cover several kilometers (Sukumar, 1991) as part of their home range as they engage in species typical activities. Lack of exercise may result in foot problems (Olson et al., 1994).

- Except for a 35 yrs old male, all elephants were allowed to walk
- Time of walking was morning and/or evening; distance covered ranged from 2-6kms, duration from 2-5 hrs

M-R for opportunity to walk was 8.1 (SE= 0.9, N= 10) with a deviation of 10% from E-R.
M-R for walk duration was 1.0 (SE= 0.0, N= 4) with a deviation of 87.5% from E-R.

Social interaction
Female elephants the wild live in groups of related individuals, their society marked by fluidity, i.e., groups are formed or separated but social relationships are long-lasting (Poole and Moss, 2008). Young males form part of the close-knit family groups, leaving their natal herds gradually between 9- 18y of age, learning about the strengths and weaknesses of other males as they play with new individuals (op.cit).

- None of the elephants was given any opportunity for social interaction (Figures 34a and b)

M-R was 0.0 (SE= 0.0, N= 6) with complete (100%) deviation from E-R.

Chaining
Captive elephants are subjected to various periods/types of chaining as a form of controlling the animals.

- Two male elephants (one 35y old and another 26y old) were chained using spiked chains (Figures 23a and b); the remaining elephants, including one with spiked chains, were chained with a plain type chain (Figures 35c and d)

Of the seven elephants for which data was available, six were chained by their leg, (Figures 36a and b) the remaining elephant was chained in the leg and neck

- Chain length ranged from 3-10ft., weight from 10-30kgs
- All the elephants (N= 7) were reported to be chained all the time
- Hobbles was used for two, a 3y old and a 35y old, elephants
- None of the elephants (N= 5) was allowed to range free at night

M-R was 0.9 (SE= 0.7, N*= 6) with a deviation of 88% from E-R. Figures 4a and 4b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for chaining sub-parameters.

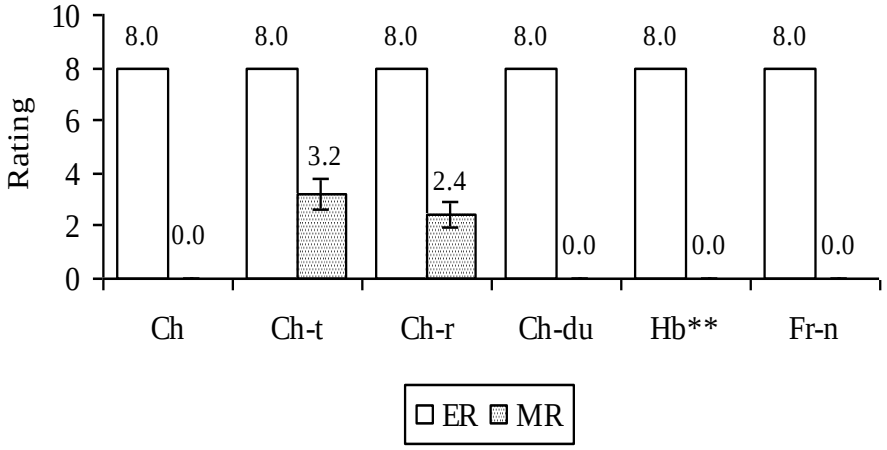
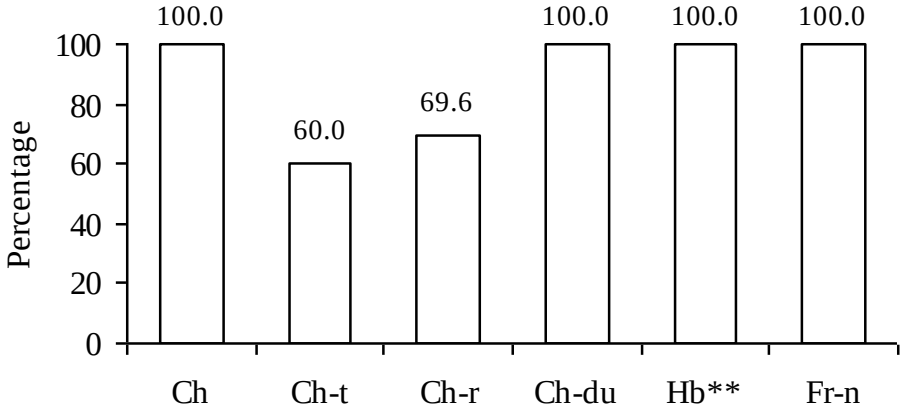


Figure 4a: Comparison between E-R and M-R for chaining sub-parameters



Rating based on two individuals only

Ch: Chaining status Ch-t: Chain type Ch-r: Chaining region Hb: Hobbles
Fr-n: Free-ranging at night

Figure 4b: Percentage wise deviation from E-R for chaining sub-parameters

Behaviour

Elephants which are aggressive or unpredictable maybe difficult to manage, as compared to those described as calm/ quiet.

- Except for two adult males, all elephants were described as calm/quiet
- The two adult males (26yrs and 35yrs) were reported to be "rough" with one of the males having injured its mahout
- None of the elephants exhibited stereotypy

M-R was 7.2 (SE= 0.7, N*= 3) indicating a deviation of 9.5% from E-R. Figure 5a and 5b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for behaviour sub-parameters.

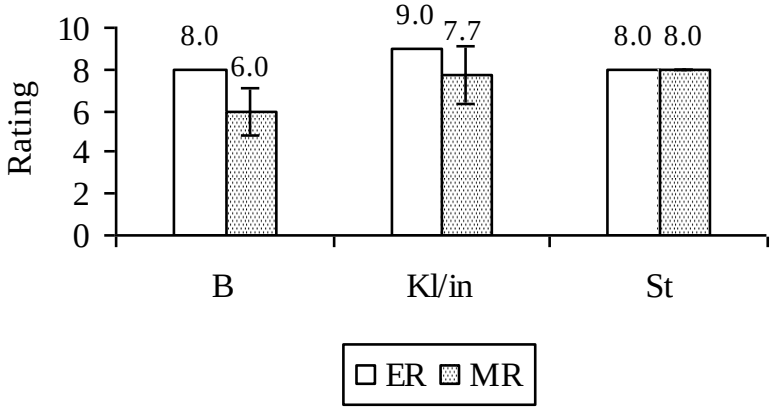
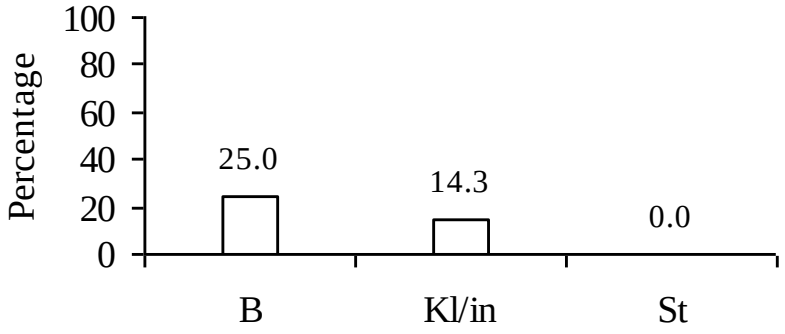


Figure 5a: Comparison between E-R and M-R for behaviour sub-parameters



B: Observed behaviour Kl/in: Incidents of killing/injury St: Occurrence of stereotypy

Figure 5b: Percentage wise deviation from E-R for behaviour sub-parameters

Work

Any work that involves performance of natural behaviours without imposing restrictions on the animals' ability to choose its activity can be considered to be psychologically and physically stimulating.

- Except for a 35yrs old male, none of the elephants was used for work
- The lone working elephant was used in functions such as marriages or other social occasions (Figures 41a and b); time of work was in the evening for a duration of 4-5h; the elephant had begun to work when it was 7y old

M-R was 7.2 (SE= 0.8, N= 10) indicating a deviation of 10% from E-R.

Food

The variety of plant species and plant parts eaten in the wild (Sukumar, 1991) cannot be replicated in captivity if the animals are given only stall feed. Management protocol such as maintenance of ration charts can help in maintaining inventory of stocks as well as diet of the elephant/s.

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- Except for a 35yrs old male, all elephants were given only stall feed (Figures 42a and b); the elephant allowed to browse/graze did so within a farmland
- Hygiene of feeding place (Figures 43a and b) need to be improved a lot
- Stall feed included leaves, rice (milled grains of *Oryza sativa*), paddy (unmilled grains of *Oryza sativa*), wheat (milled grains of *Triticum aestivum*), Sugarcane (*Sacharum* sp.), Jaggery (unrefined, concentrated product of sugarcane juice)
- Mineral mixture was given for two male elephants, no data was available on this aspect for other elephants
- Ration chart was not used for any of the elephants

M-R was 3.1 (SE= 1.7, N*= 6) showing a deviation of 61.7% from E-R. Figures 6a and 6b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for food sub-parameters.

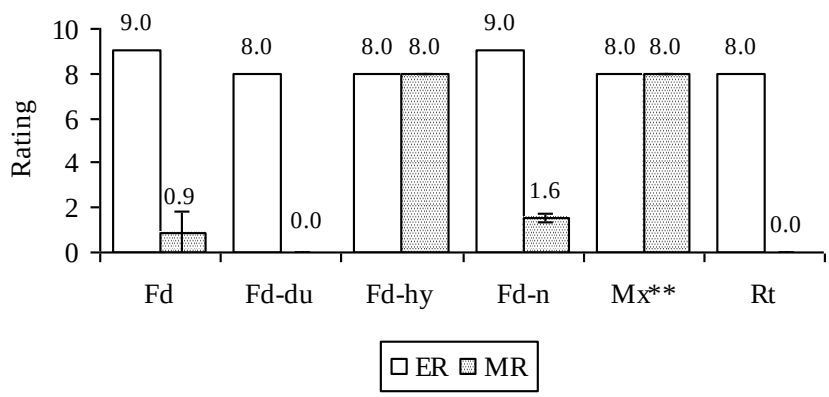
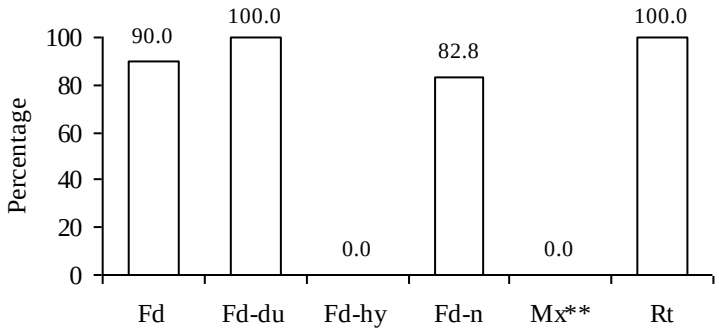


Figure 6a: Comparison between E-R and M-R for food sub-parameters



Fd: Food provisioning type Fd-du: Feeding duration Fd-hy: Hygiene of feeding place
Fd-n: Number of food items Mx: Availability of mineral mixture Rt: Usage of ration chart

Figure 6b: Percentage of deviation from E-R for food sub-parameters

Reproductive status

Normal reproductive functioning among captive elephants is an indicator of not just presence of individuals of opposite sex and opportunities to mate but also absence of physiological anomalies.

- The single adult female elephant was not reproductively active
- None of the adult males (six in number) was reproductively active
- Musth was reported for a single adult male

M-R for reproductive activity of elephants was 0.0 (SE= 0.0, N= 7) showing complete (100%) deviation from E-R. M-R for musth occurrence was 8.0 (N= 1) showing no deviation from E-R.

Health status

In captivity, elephants are prone to certain diseases/disorders (Mikota et al., 1994) such as foot problems, exposure to new diseases as a consequence of their living conditions.

- There was no information on the diseases or injuries sustained by the elephants
- All the observed elephants (N= 3) had been dewormed
- None of the elephants (N= 4) had been immunized
- Oil (Mustard/ coconut oil) was applied in the head region after bathing the elephants

M-R was 5.0 (SE= 3.1, N*= 3) with a deviation of 37.5% from E-R. Figure 7a and 7b compare E-R with M-R and percentage of deviation from E-R, respectively, for health sub-parameters.

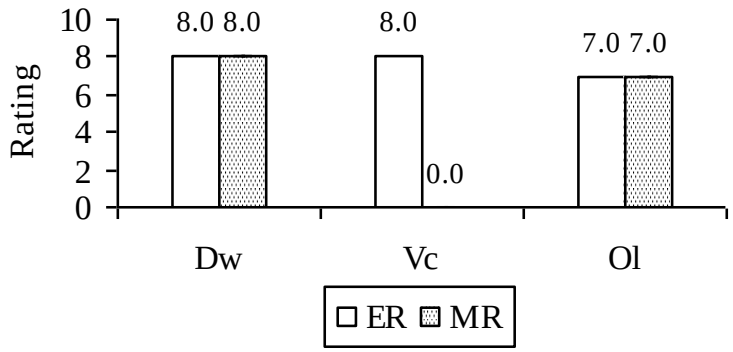
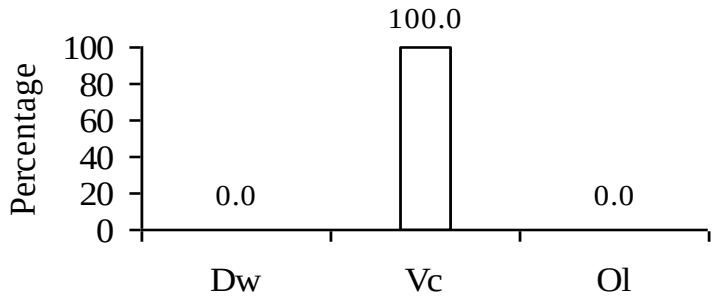


Figure 7a: Comparison between E-R and M-R for health sub-parameters



Dw: Deworming status Vc: Vaccination status Ol: Oiling status

Figure 7b: Percentage of deviation from E-R for health sub-parameters

Veterinary personnel

Maintenance of health of captive elephants involves availability of personnel with relevant experience. An important aspect of this system is the regular maintenance of records (health/ service/ body measurements, etc.).

- 67% (N= 9) of the elephants did not have access to veterinary doctors
- Two, of the three, doctors available did not have experience in treating elephants
- Frequency of visits was dependent on calls by owners with one doctor said to visit weekly
- Veterinary assistant was not available for any of the observed elephants (N= 6)
- Records were not maintained

M-R was 1.9 (SE= 1.0, N*= 6) showing a deviation of 75.4% from E-R. Figures 8a and 8b compare E-R with M-R and Percentage of deviation from E-R, respectively, for the sub-parameters.

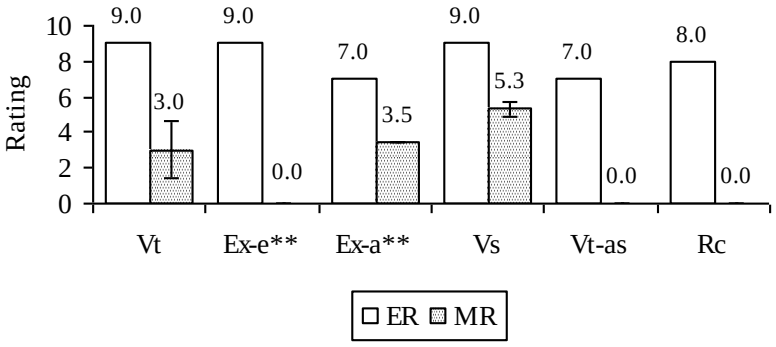
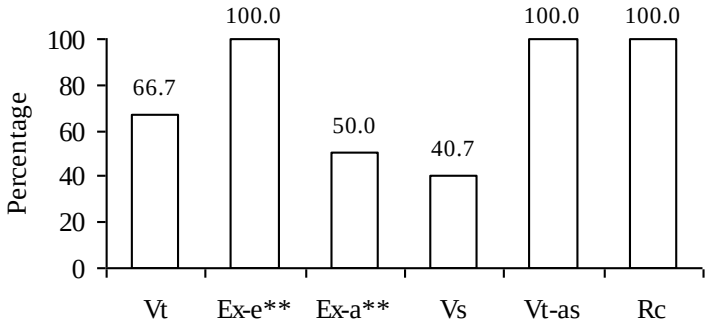


Figure 8a: Comparison between E-R and M-R for veterinary personnel sub-parameters



**: Rating based on two individuals only

Vt: availability of veterinary doctor Ex-e: Experience with elephants
Ex-a: Experience with specific animals Vs: Frequncy of visits
Vt-as: Availability of veterinary assistant Rc: Maintenance of records

Figure 8b: Percentage of deviation from E-R for veterinary personnel sub-parameters

Handlers' socio-economic status

Handlers are an essential part of a captive elephant system; a socio-economic profile of handlers may indicate the deficiencies within welfare status of elephant keepers

- None of the handlers came from a background associated with elephant handling
- Mean age of mahouts/cawadis was 38 yrs (SE= 2.9, N= 10) ranging from 22-50 yrs (Figures 50 a, b and c).
- Except two, all handlers were literate
- Mean annual salary was Rs9800/-, ranging from Rs.8400 to Rs.12000/-
- All handlers were married, number of children per family ranged from 3-4
- Languages known to the handlers were Hindi and/ or Bhojpuri
- All handlers used tools: metal ankush, wooden ankush, stick
- Insurance cover was not provided for any of the handlers

- Handlers consumed alcohol after work hours (two of the three for whom data was available)

M-R was 2.1 (SE= 0.6, N*= 7) indicating a deviation of 74% from E-R. Figure 9a and 9b compare E-R with M-R and Percentage wise deviation from E-R, respectively, for the sub-parameters.

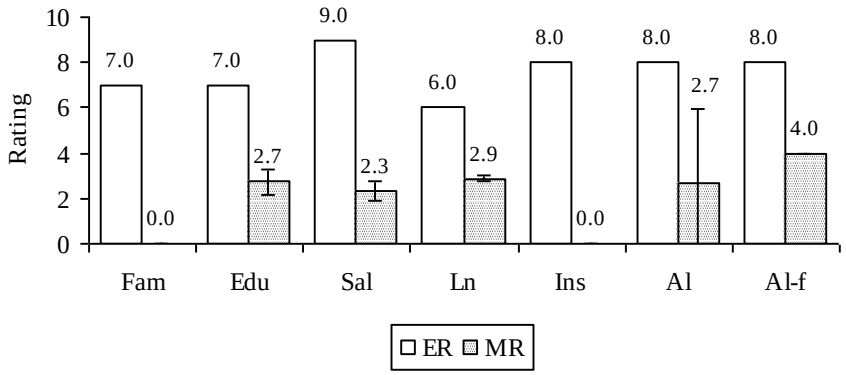
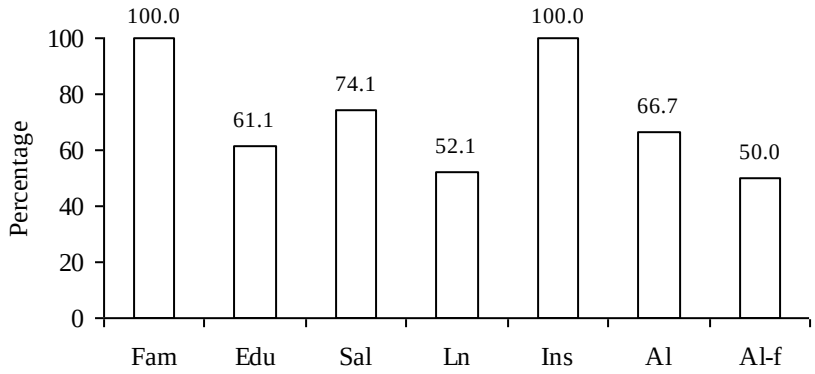


Figure 9a: Comparison between E-R and M-R for socio-economic status



Fam: Family occupation Edu: Education status Sal: Salary drawn
Ln: Languages known Ins: Insurance availability Al: Alcohol consumption
Al-f: Frequency of alcohol consumption

Figure 9b: Percentage of deviation from E-R for socio-economic status

Overall welfare status

Overall M-R, across all observed parameters, was 3.0 (SE= 0.5, N*= 41) showing a deviation of 62.5% from E-R. Hence, on an average, a parameter would deviate to this extent from the prescribed norms. Figure 10 shows Percentage of deviation from E-R for all the observed parameters. Apart from higher occurrence of maximum deviation from E-R, deviations of 50% or more accounted for 69% of all the deviations (N*= 42). Thus, only 30% (N*= 42) of the observed parameters showed a difference of less than 50% from E-R.

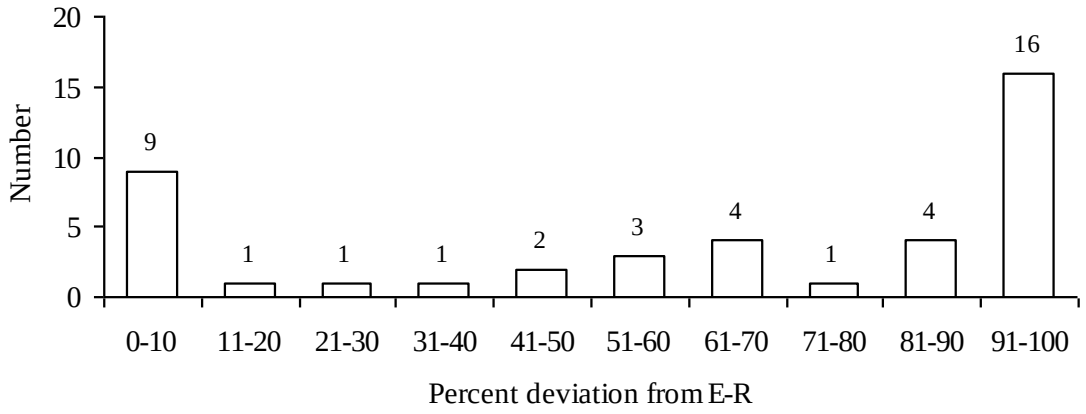


Figure 10: Distribution of Percentage wise deviation from E-R across all observed parameters

Discussion

Welfare status of captive elephants with private owners, across the state of Bihar, has been rated using the premise that greater deviation from wild conditions is an indication of poor welfare. Importance of different parameters (sub-parameters), to the captive elephants, has been assigned using a scale developed by a team of experts to quantify this deviation through a rating system. One distinguishing aspect of the elephants with the observed owners was its symbolic nature— the animals were maintained to represent a human quality; features characteristic of elephants were either completely absent or deficient.

Features not suitable for captive elephants were:

- All the elephants were confined to a restricted space and chained for most parts of a day. Elephants, especially adult males, tend to cover larger distances (Fernando et al., 2008) showing their ability and their need to move as they perform species-typical activities; wild elephants, in general have rarely been observed to be still (Poole and Granli, 2009).
- Water was provided within the shelter through hose-pipes/ taps, both of which cannot be accessed by the elephants when they need to drink/ bathe
- Wild elephants spend a major part of their day moving across varied terrain as they forage and engage in species-specific activities— an activity restricted to being walked by handlers for a couple of hours for the observed elephants. One elephant was not provided this opportunity also.
- None of the observed elephants was allowed to forage at night; most of the elephants (except for an adult male) were not allowed to free range at all; thus stall feed was the predominant type of food provisioning.
- Ashraf and Mainkar (2004) recommend the removal of hobbles for calves observed in Sonepur Mela. During this survey, hobbles were observed to be used for a calf as young as three years old. In addition to hobbles, an adult male was also restrained using spiked chains. Gruber et al., (2000) report increasing incidence of stereotypy among chained elephants as compared to those left free in pens.
- Elephants, especially females and dependent young, live in social groups, lasting across generations (Poole and Moss, 2008). All elephants, even those which were less than five years were kept singly, in isolation.

- Stall feed was the sole source of food provisioning for nine of the ten observed elephants. This has two effects: absence of variety of food types and consequent imbalanced nutrition and secondly, absence of physical/ psychological activity for the elephants. More so, since most of the elephants (nine of the observed ten) were not put to work. The lone adult male was used for such unnatural activities as participating in social occasions such as marriages.
- Absence of reproductive functioning among adult elephants
- Most of the observed elephants (67%) did not have access to veterinary doctors or veterinary clinic facility
- None of the elephants were immunized against known diseases
- There was no record maintenance (health/ clinical) of the elephants.

Handlers:

- None of the handlers came from a family background dealing with elephants. This implies new entrants into the profession and a possible lack of knowledge about elephants
- The salary paid to the handlers was insufficient for a family with an average of four members
- None of the handlers was covered by insurance, despite the occurrence of injury to a mahout by his elephant

Reference

1. Anonymous (2007). Estimateed population of wild elephants 2007-2008. Report of Project Elephant, Accessed online: http://envfor.nic.in/pe/population_ce.pdf
2. Ashraf, N.V.K. and Mainkar, K. (2004) 'Fair concern': Health and management of captive elephants in Sonpur. Wildlife Trust of India, New Delhi.
3. Bist, S.S., Cheeran, J.V., Choudhary, S., Barua, P. and Mishra, M.K. (2002). The domesticated Asian elephant in India. In: Giants on Our Hands: Proceedings of the International Workshop on the Domesticated Asian Elephant, Bangkok, Thailand
4. Bradshaw, G.A. (2007). Elephants in captivity: analysis of practice, policy, and the future, Society & Animals: 1-48.
5. Fernando, P., Wikramanayake, E. D., Janaka, H. K., Jayasinghe, L. K. A., Gunawardena, M,, Kotagama, S. W., Weerakoon, D. and Pastorini, J. (2008) Ranging behavior of the Asian elephant in Sri Lanka, Posted at the Zurich Open Repository and Archive, University of Zurich. http://www.zora.uzh.ch; Originally published at: Mammalian Biology - Zeitschrift fur Saugetierkunde 2008, **73**(1):2-13
6. Gruber, T.M., Friend, T.H., Gardner, J.M., Packard, J.M., Beaver, B. and Bushong, D. (2000). Variation in stereotypic behaviour related to restraint in circus elephants. Zoo Biology 19: 209-221
7. Mikota, S.K., Sargent, E.L., and Ranglack, G.S. (1994). Tuberculosis and tuberculin testing. In: Medical management of the elephant (Mikota, S.K., Sargent, E.L., and Ranglack, G.S., eds.) Indira Publishing House, U.S.A
8. Olson,D., Keele, M. and Tuttle, D. (1994). Husbandry and management. In: Medical management of the elephant (Mikota, S.K., Sargent, E.L., and Ranglack, G.S., eds.). Indira Publishing House, U.S.A

9. Poole, J. and Granli, P. (2009). Mind and Movement: Meeting the Interests of Elephants. In: An elephant in the room: the science and well being of elephants in captivity, (Forthman, D.L., Kane, F. L., Hancocks, D., and Waldau, P.F. eds.) Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Tufts University
10. Poole, J.H. and Moss, C.J. (2008). Elephant sociality and complexity The scientific evidence. In: Elephants and ethics toward a morality of coexistence (Eds: Wemmer, C and Christen, C. A) The John Hopkins University Press, Baltimore. (Accessed online: http://www.elephantvoices.org/index.php?topic=tools&topic2=tools/documents/2_Poole_Moss_Final_7_12_06.pdf).
11. Sukumar, R. (1991). Ecology. In: Eltringham, S.K. (ed.), The Illustrated encyclopedia of elephants, Salamander Books, U.K. pp.78–101.
12. Sukumar, R. (2006). A brief review of the status, distribution and biology of wild Asian elephants *Elephas maximas*. International Zoo Yearbook 40: 1-8.
13. Varma, S. 2008. Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 7-16. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
14. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity—insights and recommendations, In: 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. (S. Varma and D. Prasad, eds.), pp. 54-64. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
15. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (S. Varma and D. Prasad, eds.), pp. 17-53. Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
16. Veasey, J. (2006) Concepts in the care and welfare of captive elephants. Int. Zoo Yb. 40: 63–79

Section 5
Captive elephants under private ownership in Karnataka State

Section 5a
Captive elephants of Aane-Mane Foundation

Executive summary

Aane-Mane Foundation is a non-profit organization, based at Dubare, Karnataka, working towards conservation of Asian elephants, welfare of captive elephants and imparts traditional knowledge in handling elephants.

Elephants maintained by the Foundation were observed along with interviewing of personnel; the data collected was used for assessing the welfare status of both the elephants and their handlers. Data was collected through observation and interview of personnel/management. Each of these features has been rated on a 0 to 10 scale with 0 representing the worst possible situation and 10 implying a satisfactory state, closer to what an animal experiences in the wild.

The Foundation maintains three elephants, aged 2, 20, and 26, at Dubare; the young one was born to one of the females maintained by the Foundation during 2007. The adult females were purchased from Lohith District, Arunachal Pradesh, north-eastern India. Shelter for these elephants is in the forest area; hence, the overall mean rating for shelter and its related parameter is 9.5 suggesting the prevalence of satisfactory conditions for this parameter.

River is used for bathing and drinking; availability and access to running water sources, presence of landscape features for expression of species-typical activities and quantity of water consumed were considered and the mean rating for this parameter and the sub-parameter is 8.

The elephants walk with mahouts for 3-6 km from 9 a.m. to 12 noon everyday. The elephants are allowed to range free in the forest; hence opportunity for walk is given high rating. Interaction is allowed between the elephants of Aane-Mane Foundation, as also with wild elephants. Mean rating for this parameter is 9.3 implying occurrence of satisfactory conditions.

Of the two adults, one elephant is described as calm, the other as nervous and no stereotypic behaviour is noticed. Mean rating is 8 reflecting satisfactory conditions.

Both the elephants are not assigned any work; they are free to range anywhere they like and there is interaction among the three and wild elephants; this forms part of their life and hence rating for this parameter is 10.0.

Food provisioning is both free ranging and stall-fed. The food provided is paddy: 45 kg for one ration, Hay - 5.5 to 6 kg, Banana - 2 dozens per day, Vegetables and fruits - 1 kg. The mean rating assigned is 8 which reflect satisfactory conditions.

Both the elephants were exposed to males and were reported to be cycling; one female has given birth, despite the absence of males; efforts were made to expose both the elephants to males, male captives as well as those from the wild. Hence, a rating of 10.0 is given for reproductive status parameter.

Veterinary doctor associated with the Forest Department is available, records are maintained, both clinical and behavioural; registration certificates are available for the elephants. Occurrence

of disease/injury and provision of suitable veterinary facility and personnel were rated and the mean rating is 10.

Overall rating for mahouts, inclusive of socio-economic and professional status, is 7 implying prevalence of moderate conditions. Fifty seven percent of the all ratings score between 8 and 10 suggesting satisfactory conditions for more than half the sub-parameters observed.

Overall mean rating for elephants kept under Aane-Mane Foundation is 8 indicating occurrence of satisfactory conditions with 76% of all observed data getting a rating between 9 and 10.

A captive situation in which conditions of intrinsic biological importance to its elephants exist will lead to better welfare and health of its animals. The welfare ratings of Aane-Mane Foundation reflect such conditions.

Introduction

Aane-Mane Foundation is a non-profit organization with its field station based at Dubare, Madikeri District, Karnataka. It is working for the conservation of elephants and preserves traditional knowledge of handling elephants through interaction with mahouts. The Dubare Field Station is home to two adult female elephants and a 2 year-old male.

Objective

Elephants maintained by Aane-Mane Foundation at Dubare were observed along with interviews of personnel; the data thus collected was used to: assess the welfare status of the (i) elephants, and (ii) elephant handlers.

Method

Wild animals that have not been domesticated go through varying periods of stress when captive conditions are imposed on them. (Bradshaw, in press). Ferrier (1947) opined that the application of the knowledge of the natural habitats of wild elephants of the period when they were actively caught and put to work, would help in maintaining the animals in good condition even in captive conditions, if they are suitable. The welfare status of elephants maintained in captive conditions has been assessed based on the premise that deviations from the natural, wild, free-ranging environment experienced by captive animals have potential consequences on the welfare and well-being of the animals.

Conditions of elephants in captivity have been assessed in relation to physical environment, social and behavioural features along with the availability and access to veterinary personnel and facility. Data was collected through observation and interview of personnel/management. Each of these features (sub-parameters) has been rated on a 0 to 10 scale with 0 representing the worst possible situation and 10 implying a satisfactory state, closer to what an animal experiences in the wild.

Rating values were graded in the following manner:

- 0 to 2.4: Bad conditions
- 2.5 to 4.9: Poor
- 5.0 to7.4: Moderate
- 7.5 to10.0: Satisfactory

For some sub-parameters such as availability of veterinary doctors, frequency of visits by the doctor, etc., the ideal condition represents ease of access and prevalence of features conducive to maintaining elephant health. Common sub-parameters have been grouped together to form a parameter. For instance, aspects of shelter/enclosure such as type, size, flooring, hygiene maintenance, etc. are grouped under the parameter shelter. Rating for a parameter is the mean across individual ratings considering all sub-parameters observed. Results depicting sub-parameters show rating for both elephants, except where they are shown separately. Percentage occurrence of rating from 0 to 10 has been depicted in a graph to show the distribution of values from bad to satisfactory conditions.

The welfare status of mahouts/handlers has been assessed by examining the socio-economic parameters and the handler's relationship with his animal in terms of experience, knowledge of commands, etc. Bad or poor welfare of the handler may result in poor handling of his animal.

Results

Population status

The Aane-Mane Foundation maintains two adult female elephants, aged 20 and 26 years, at Dubare, and a baby elephant born to one of the females.

Source of elephants

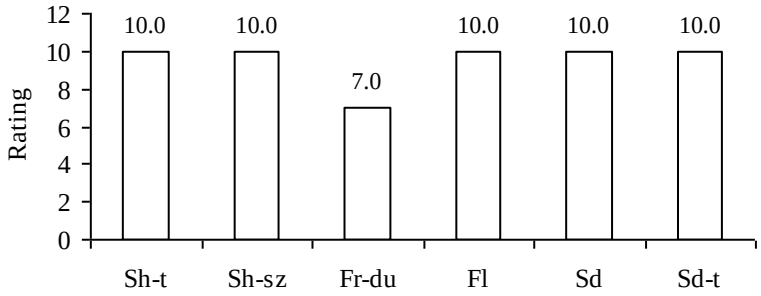
Both the elephants have been purchased from Lohith District, Arunachal Pradesh. Mar (2007) reports higher mortality rate among wild elephants raised in captivity, providing an indication of the importance of source of the captive animal. High rating is given for captive-born elephants. Rating is 2.5 (N = 2) implying purchase and transfer across owners, as both elephants were bought from owners in Arunachal Pradesh.

Shelter

- Forest area
- Vast space

Physical conditions of housing provided for the elephants have been rated. High rating is given for provision of natural conditions. Overall mean rating was 9.5 (SE = 0.4, N* = 12) implying satisfactory conditions (N* refers to the number of individual ratings across the sub-parameters observed, considering both the elephants).

The occurrence of natural, forest conditions as the physical space provided for captive elephants has been given high rating. Rating is 10.0 for both the elephants. Occurrence of natural substrates such as earthen floor was given high rating (Figure 1). Rating is 10.0 for both the elephants as they were provided natural forest conditions. Elephants are reported to range several kilometers (Sukumar, 2003) across varied habitat while foraging/feeding (McKay, 1973). Hence, availability of extensive areas as shelter habitat has been given high rating. Rating is 10.0 for the elephants kept under this regime.



Sh-t: Shelter type Sh-Sz: Shelter size Fr-du: Free range duration
Fl: Flooring Sd: Shade availability Sd-t: Shade type

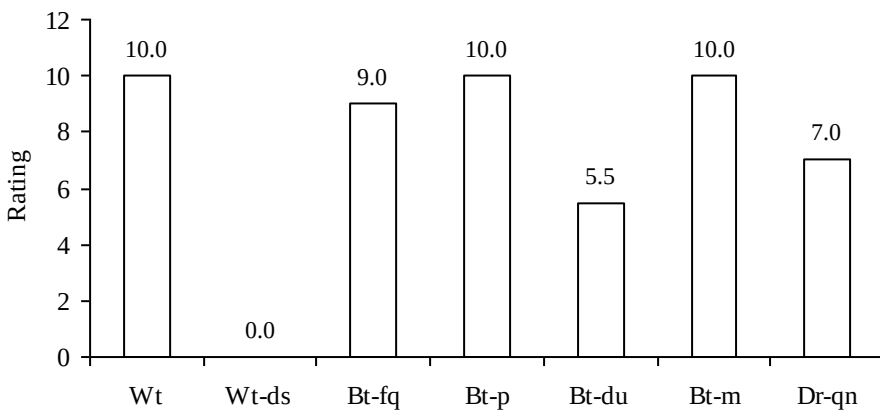
Figure 1: Rating for shelter sub-parameters.

Water

- River, for bathing and drinking
- Distance: 1.5 km
- Bathing number of times: twice/day, duration: 1.5 h
- Bathing materials used: *mundakai* (Pandanus sp.)

Availability and access to running water sources, presence of landscape features for expression of species-typical activities and quantity of water consumed were considered for this parameter. Mean rating is 7.8 (SE =1.1, N* = 14) implying satisfactory conditions (N* refers to the number of individual ratings across sub-parameters observed, considering both the elephants).

Running water sources such as rivers have relatively less contamination following usage; hence they have been given high rating. Rating is 10.0 for both the elephants. Easy accessibility to water source is given high rating. Considering that the elephants are walked to the source for their bathing routine, rather than allowing them unlimited usage of water, rating is 0.0 for both the elephants as water source is at a distance of more than a kilometer. Provision of a bathing place which allows for performance of species-specific activity is given high rating (Figure 2). Rating is 10.0 for both the elephants as they are taken to a river. When elephants are allowed to range free, quantity of water taken is assumed to be a function of the duration of free range. Rating is 10.0 for both the elephants as they are allowed to graze for 18 to 20 h in the forest.



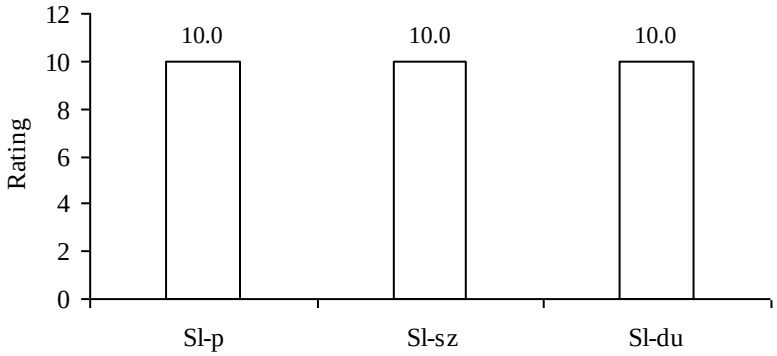
Wt: Perennial water source Wt-ds: Distance to water source
Bt-fq: Bathing frequency Bt-p: Bathing place
Bt-du: Bathing duration Bt-m: Bathing materials
Dr-qn: Quantity of water consumed

Figure 2: Rating for water sub-parameters

Sleep and related features

- Rest provided, place: forest
- Sleeping place: forest
- Duration of sleep: 4.5 h at night

Sleeping for normal duration as observed among wild elephants, access to suitable substrates and space are given high rating (Figure 3). Mean rating is 10.0 (SE = 0.0, N = 6). Elephants allowed to use forest areas are given high rating. Rating is 10.0 for both the elephants. Elephants sleep for 3 to 4 h (Zepelin *et al*., 2005). Deviations from this norms are assigned low scores. Rating is 10.0 for both the elephants.



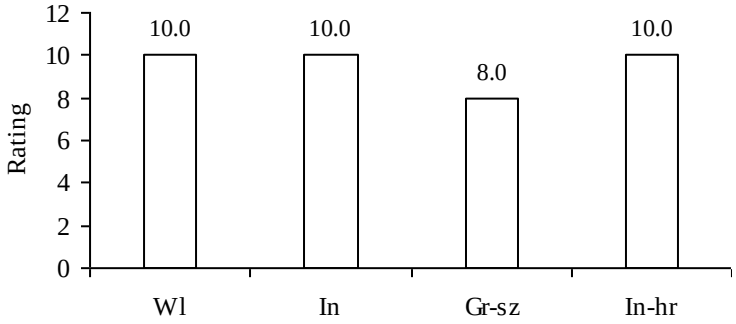
Sl-p: Sleeping place Sl-sz: Sleeping area (size) Sl-du: Sleep duration

Figure 3: Rating for sleep sub-parameters

Walk and social interaction

- Walking with mahouts for 3 to 6 km from 9 a.m. to 12 noon
- 24-hour interaction provided
- Number of animals two, (three, with the birth of a baby elephant)

The elephants are allowed to range free in the forest; hence opportunity for walk is given high rating. Interaction is allowed between the elephants (Figure 4), as also with wild elephants. Mean rating is 9.3 (SE = 0.5, N= 6) implying satisfactory conditions.



Wl: Opportunity for walk In: Opportunity for social interaction
Gr-sz: Group size In-hr: Interaction duration (h)

Figure 4: Rating for walk and social interaction sub-parameters

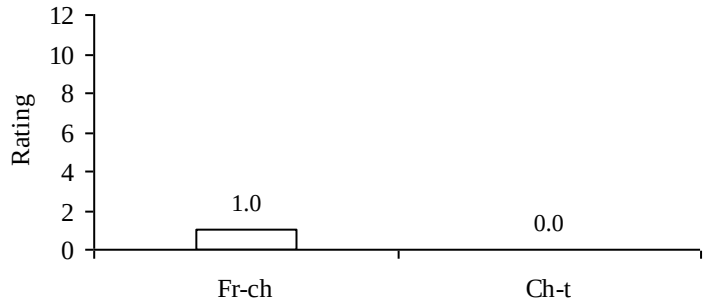
Chaining

- Grazing most of the time in forest, 18 to 20 h
- Chained for one hour

- Free ranging with hobbles and drag chain
- Leg chain dimension: 57 kg, 8 mm thick, 3 m length
- Body chain dimension: 15 kg, 8 mm thick, 10 m length
- Free ranging distance: 5 to 15 km, duration across season: 13 to 15 h
- Allowed to range free at night

Use of chains to keep tabs on captive animals is an age-old practice, practiced widely by the British for their work-elephants in Burma (Ferrier, 1947) and Assam (Stracey, 1963). The practice of chaining can be counter-productive considering the potential consequence of abrasive action of the chains on the elephant's skin (Kurt and Garai, 2007) and efforts by the elephants to walk, as a result of being hobbled. This parameter has been rated considering chaining aspects while the elephants are allowed to range free. Mean rating is 0.5 (SE = 0.3, N* = 4) indicating bad conditions.

High rating is meant to reflect increased duration of free range without chains on the elephant. Rating is 1.0 for both the elephants as they are allowed to range free for nearly 20 h with chains. Rating is 0.0 (Figure 5) as the elephants were hobbled, in addition to having a drag chain.



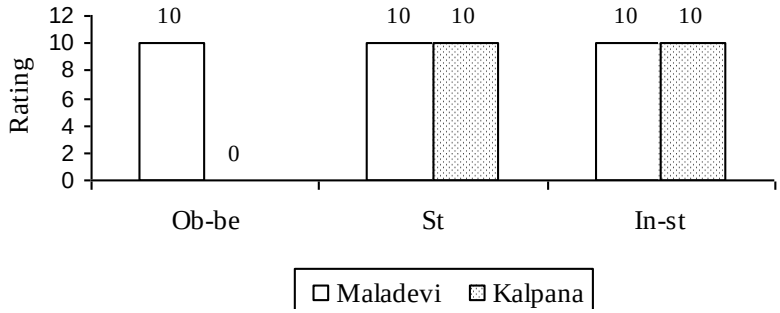
Fr-ch: Free-ranging duration with chains Ch-t: Chain type while free -ranging

Figure 5: Rating for chain sub-parameters

Behaviour

- One elephant is described as calm, the other nervous
- No stereotypic behaviour noticed

This parameter is designed to show the temperament of the elephant along with occurrence of aberrant behaviours, if any. Mean rating is 8.3 (SE = 1.8, N = 6) reflecting satisfactory conditions. Temperament is an indication of the ease with which people can handle the animal. It is also important to the animal itself in captive situations due to interaction with con-specifics amid human-induced limitations on movement. High rating is given for calm animals. Rating is 10.0 for one elephant and 0.0 for the other (Figure 6). Rating for this feature is 10.0 showing both the elephants did not exhibit stereotypic behaviour.



Ob-be: Observed behaviour St: Occurrence of stereotypy
In-st: Intensity of stereotypic behaviour

Figure 6: Rating for behaviour sub-parameters

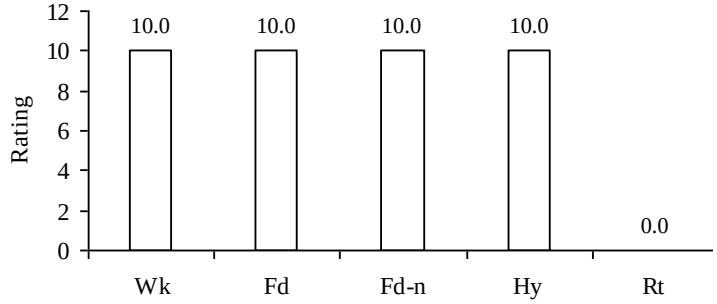
Work

Both elephants were not put to any work; free ranging in nature and interaction among the three and the wild elephants, forms part of their life, hence, rating for this parameter is 10.0.

Food provisioning

- Free ranging and stall-fed
- Paddy: 45 kg /day; hay- 5.56 kg, banana 2 dozens per day, Vegetables and fruits: 1 kg.

Provision of a variety of foods and opportunity to browse/graze freely along with organized feeding routine was considered. Mean rating is 7.5 (SE = 1.8, N = 8) representing satisfactory conditions. Opportunity both to range free and stall-feed was given high rating. Rating is 10.0 (Figure 7) for both the elephants. The management can use ration chart to plan for the animal's diet according to its health and physiological needs. Mean rating is 1.4 (SE =1.5, N = 7).



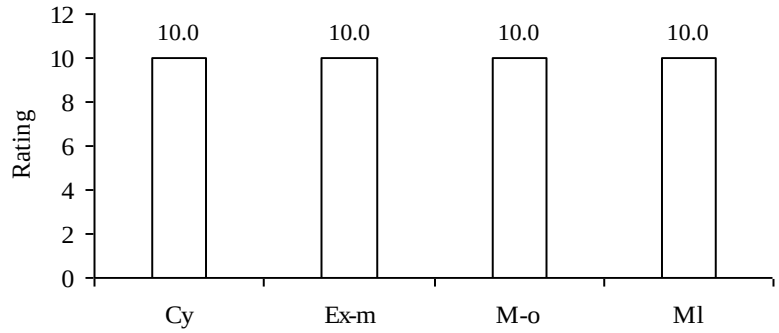
Wk: Work type Fd: Food provisioning type
Fd-n: No. of food items Hy: Hygiene of feeding place
Rt: Usage of ration chart

Figure 7: Rating for food sub-parameters

Reproductive status

- Both elephants reported to be cycling, exposed to males
- Male source: wild and captive

Normal reproductive functioning in adult elephants is considered to be associated with normal physical health (Kurt and Garai, 2007), opportunity for mating, among other related factors (Taylor and Poole, 1998). Mean rating is 10.0 (SE = 0.0, N* = 8). Despite the absence of males in the group, both the elephants have been exposed to males as efforts were made to expose them to male captive elephants and to range free in the forest. Hence, rating is 10.0 (Figure 8) for this sub-parameter. Opportunity provided for mating is said to be in the form of exposure to both captive and wild males. Hence, rating is 10.0 for this sub-parameter.



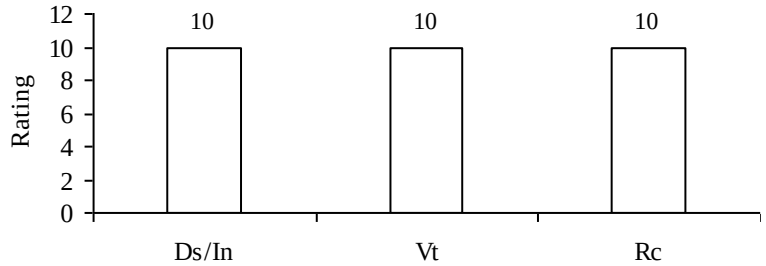
Cy: Occurrence of oesrtus cycles Ex: Exposure to males
Obs-m: Mating observed/ not Ml: Male source

Figure 8: Rating for reproductive state sub-parameters

Health status and veterinary care

- Old rope wounds, healed now
- Veterinary doctor available, associated with Forest Department
- Records maintained: clinical and behavioural; registration certificate available for both the elephants

Occurrence of disease/injury and provision of suitable veterinary facility and personnel was rated. Mean rating is 10.0 (SE = 0.0, N* = 6). Records were maintained of clinical aspects such as de-worming/vaccination, etc. Hence, the rating is 10.0 (Figure 9).



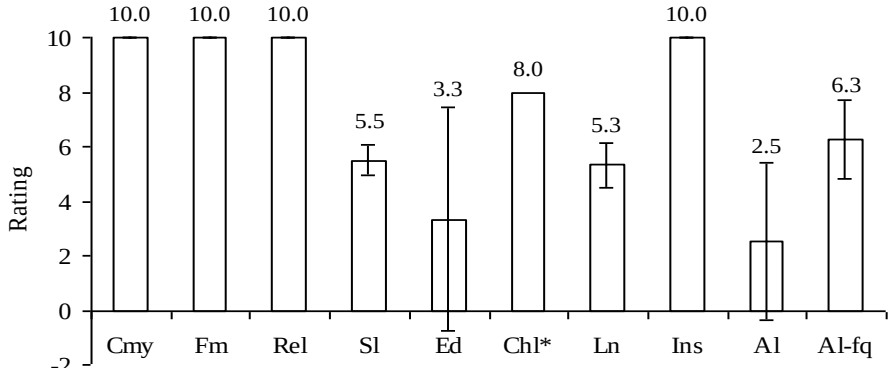
D/In: Disease/Injury occurrence Vt: Availability of veterinary doctor
Rc: Record keeping

Figure 9: Rating for health and veterinary-care sub-parameters.

Welfare status of the mahout

- Two mahouts and two cawadis handle the elephants.
- Mean age is 26.5 years, (SE = 5.6, N =4) ranging from 19 to 40 years.
- Mean experience with specific elephant is 2.3 years, (SE= 0.7, N = 4) ranging from 14 years.
- The handlers belong either to Muslim community or Jenu Kuraba tribe having relatives working in the same profession.
- They seem to have received training in this profession.
- Mean annual salary is Rs. 29,950/- (SE = 2092.1, N = 4) ranging from Rs. 25,000–33,600.
- Both the mahouts are married, while both the cawadis are single.
- Accommodation is available (provided) for all the mahouts.
- Languages known: Kannada, Urdu, English or a combination of all.
- Three handlers used bamboo cane to control their elephants while two also use "Kokka" or "Kokkai" (round tiphook with wooden shaft).
- Insurance cover is available for three handlers.
- The number of mahouts changed for each elephant is 2.8 (SE = 2.3, N = 3).
- Three of the four handlers consumed alcohol, but after work.

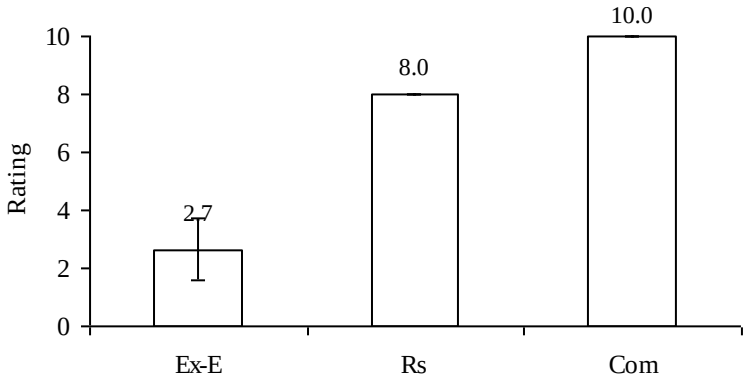
Welfare of mahout/cawadi has been assessed based on his/her socio-economic status, along with his/her professional status in terms of experience, knowledge of commands and reason for choosing this profession. There were two mahouts, aged 20 and 26 years, and two cawadis, aged 20 and 19 years. The socio-economic profile of handlers was rated to assess economic independence, literacy level, substance abuse as well as traditional association with this profession. Mean rating is 7.0 (SE = 0.7, N* =33) indicating moderate conditions (N* refers to the number of individual ratings considered across all the sub-parameters). Junior mahouts (cawadis) were said to be illiterate while one mahout had studied up to 10th standard. Mean rating is 3.3 (SE = 4.1, N = 4). Mean rating for salary is 5.5 (SE = 0.6, N = 4) with three mahouts getting a rating of 6.0. Rating is 2.5 (SE= 5.0, N = 4) with three mahouts/cawadis said to consume alcohol (Figure 10).



Cmy: Community of mahout Fm: Family occupation Rel: Having mahout relatives
Sl: Salary given Ed: Education status Chl*: Number of children (Sample size = 1)
Ln: Number of languages known In: Insurance cover availability
Al: Alcohol consumption Al-fq: Consumption frequency

Figure10: Rating for socio-economic sub-parameters

This parameter rates the handler's experience with particular elephant or in the profession. Mean rating is 6.3 (SE = 0.9, N** = 13) showing moderate conditions (N** refers to the number of individual ratings across each of the sub-parameters observed). Higher rating value implies more experience in this profession, calculated as percent of mahout's age. Data was available for two handlers: rating for one mahout was 2.5, and for a cawadi 5.0, indicating poor conditions (Figure 11). Higher rating value indicates more experience with the elephant being observed, with experience being calculated as percent of the elephant's age. Mean rating value was 2.7 (SE = 1.0, N = 4) indicating occurrence of poor conditions for this sub-parameter.



Ex-A: Experience as % of mahout age Res: Reason for choosing this profession
Com: Knowledge of commands

Figure 11: Rating for professional status sub-parameters

Overall rating for mahouts, inclusive of socio-economic and professional status, was 6.8 (SE = 3.6, N* = 46) implying occurrence of moderate conditions. Fifty seven percent of the all ratings were between 8 and 10 (Figure 12) implying satisfactory conditions for more than half the sub-parameters observed.

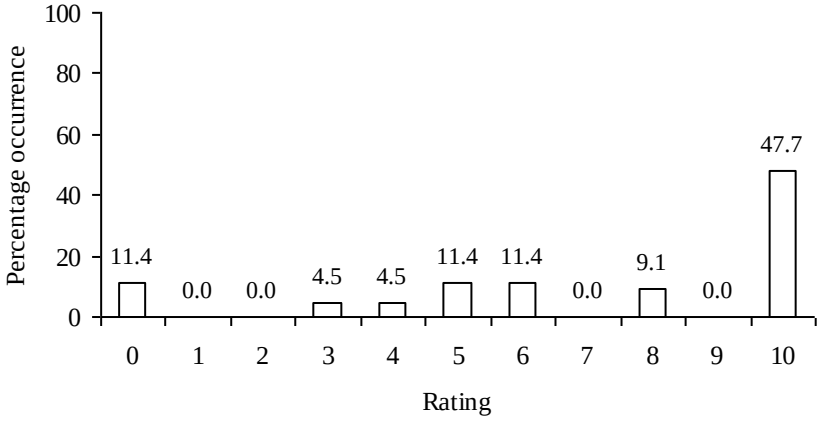


Figure 12: Percentage occurrence of overall rating

Overall mean rating for elephants kept under Aane-Mane Foundation, considering each value across all parameters/sub-parameters observed, is 8.4 (SE = 0.4, N = 75) indicating occurrence of satisfactory conditions with 76% of all observed data getting a rating between 9 and 10 (Figure 13).

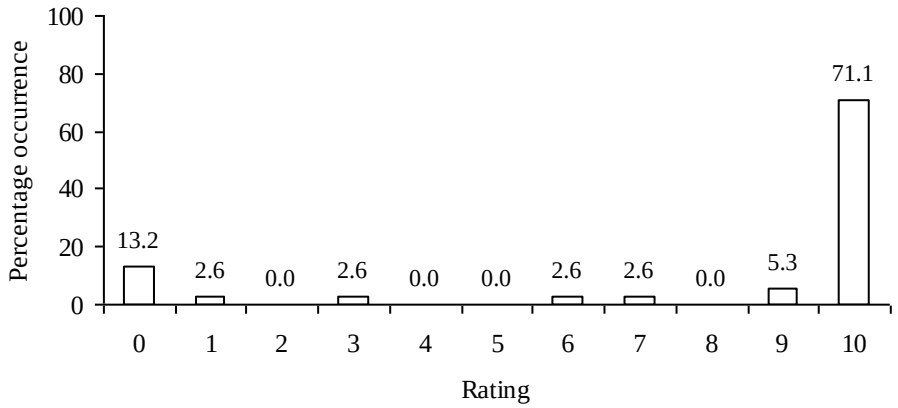


Figure 13: Overall rating for elephants

Discussion

Overall mean rating for elephants is 8 suggesting satisfactory conditions with 76% of all observed data getting a rating between 9 and 10.

High rating, using this method of evaluation, could be due to two reasons:

1. Factual representation of the actual situation.
2. Faulty presentation of welfare profile as a consequence of occurrence of only ten values in the observed data. This can happen when the observed data occurs in the form of a Presence/Absence set with only two possible values, 10 or 0, without providing any further insight into the data.

Overall data collected represented 53% of relevant information that could be collected. A total of 39 sub-parameters were rated. Contribution of ten ratings from "Presence/Absence" data was only 26% to the overall rating. Hence, this aspect of adding to high rating, for this organization, can be ruled out.

A captive situation which provides conditions of intrinsic, biological importance to its elephants may lead to better welfare and health of its animals. For the Aane-Mane elephants, welfare rating reflects the occurrence of such conditions. Both female elephants are provided with vast space in a forest area to range-free, browse/graze with access to a river, to engage in species-specific activities. Extensive systems of captivity which provide for a relatively high expression of species-specific behaviour/activity of their elephants have recorded breeding success while many elephants in intensive systems could be regarded as unfit for reproduction due to poor body growth associated with physical and psychological stress (Kurt *et al*., 2003/2004). The birth of a baby elephant by one of the female elephants at Aane-Mane recently, following mating with a wild male, adds value to this observation.

However, a negative aspect for these two elephants was the use of hobbles while ranging free. Kurt and Garai (2007) state that chaining the same region repeatedly may result in abrasion of the skin and consequent wounds which could be recalcitrant to treatment (They also stress on the importance of learning and development in a natural herd structure for wild elephants. The number of adults at the Aane-Mane group was only two. This situation may improve as a consequence of successful breeding of offspring.

Overall rating for mahout is 7 implying occurrence of moderate conditions. Fifty seven per cent of the all ratings were between 8 and 10 suggesting satisfactory conditions for more than half the sub-parameters observed.

Some features which were given low rating (less than 5) were:

1. Experience in the profession and with specific elephant: The incidence of people taking up this profession out of a need for employment rather than interest is on the rise (Lair, 1997). All the mahouts with this organization were given high ratings for community, family occupation and having relatives among mahouts indicating occurrence of suitable conditions. Their reason for joining this profession is said to be to continue a family tradition. This may not necessarily include a liking for the job of handling elephants. When interest in the job diminishes, there is likelihood of occurrence of conflict situation. However, this may be a temporary attitude and they could be interested in their jobs in the long run.

2. Consumption of alcohol: Three of the four mahouts seem to drink alcohol, but after work. Handling elephants is a 24-h job, hence, this practice may reflect on the care provided to the elephants.

References:

1. Bradshaw, G.A. (in press). Chapter 4. Inside Looking Out: Neuroethological Compromise Effects in Elephants in Captivity. In: An Elephant in the Room: the Science and Well Being of Elephants in Captivity. pp: 55 – 68. (Referred Online http://www.loudmonks.com/)
2. Ferrier, A.J. (1947). Care of Elephants in Burma. London, Messrs. Steel Brothers Co. Ltd
3. Kurt, F. and Garai, M.E. (2007). The Asian elephant in captivity—a field studies. Foundation books, Cambridge University press, New Delhi.
4. Kurt, F., Mar, K.U. and Garai, M. (2003/2004). Giants in Chains: History, Biology and Preservation of Asian elephants in captivity. Smithsonian Institution of Washington: Ethics and Elephants. (accessed online)
5. Lair, R.C. (1997). Gone Astray - The Care and Management of the Asian Elephant in Domesticity. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand.
6. Mar, K. U. (2007). Myanmar Elephant Studbook: What are We Learning from Numbers? EU-Asia Link Project Symposium "Managing the Health and Reproduction of Elephant Populations in Asia" 8-10 October 2007 Faculty of Veterinary Medicine, Kasetsart University, Bangkok, Thailand, pp: 51 - 71.

7. McKay, G.M. (1973). Behavior and Ecology of the Asiatic Elephant in Southeastern Ceylon. Smithsonian Institution Press, City of Washington.
8. Stracey, P.D. (1963). Elephant gold. Nataraj Publishers, Dehradun.
9. Sukumar, R. (2003). The living elephants. New York: Oxford University Press.
10. Taylor, V.J. and Poole, T.B. (1998). Captive breeding and infant mortality in Asian elephants: A comparison between twenty western zoos and three Eastern elephant centers. Zoo Biology. **17**: 311-332.
11. Zepelin, H., Siegel, J.M. and Tobler, I. (2005). Mammalian Sleep. Accessed online: http://www.npi.ucla.edu/sleepresearch/Mammalian_Sleep.pdf

Section 5b
Captive elephants of Mysore Palace

Executive Summary

The royal palace of the erstwhile Maharaja of Mysore has been home to captive elephants for over a hundred years. Currently, the number of elephants maintained by the successors to the throne at the Regency Stud Farm in Mysore Palace is vastly reduced, numbering only seven.
Data was collected by observing elephants and interviewing of personnel/management. Each of these features has been rated on a 0 to 10 scale with 0 representing the worst possible situation and 10 implying a satisfactory state, closer to what an animal experiences in the wild.

The welfare status of mahouts/handlers has been assessed by looking at socio-economic parameters and the handler's relationship with his animal in terms of experience, knowledge of commands, etc. Bad or poor handler welfare maybe associated with poor handling of his animal.

There are seven elephants at the Palace, of which six are females. Their mean age is 30.5 years with the age of females ranging from 14 to 45 years. The single male was aged 20 years.

Shelter for the observed elephants is open, with earthen flooring, and of a size of 80,729 sq. ft. Mean rating for shelter is 4.0 and for the floor is 10 indicating suitable substrate.

The source of water for drinking/bathing is tap water at a distance of 200 m; an artificial pond is used sometimes for bathing. Mean rating for water-related parameters is 6 indicating the occurrence of moderate conditions for this parameter.

All the animals are walked 3 to 4 km surrounding the stud farm, and are allowed opportunity for interaction, the number of individuals ranging from 6 to 7 and the distance between animals ranged from 10 to 25 ft.

The elephants are allowed to walk; hence, rating of 10.0 is assigned for this feature and the mean rating for interaction is 6 indicating occurrence of moderate conditions.

The elephants are controlled with iron chains tied in the leg region; none is allowed to range free. Mean rating for chaining is 0.3 highlighting the existence of bad conditions for this parameter.

All the observed elephants are described as being calm, except for the single adult male elephant. Rating of 9 shows manageable temperament such as quietness/calmness.

Work type involves carrying tourists, 8 to 9 days/month, the distance covered is 50 m, 200 to 300 times a month and the mean rating for work is 3.

The elephants are given only stall feed, feeding area is an enclosure, and food provided ranged from paddy, rice, ragi balls, all grams, vegetables, jaggery, green grass, sugarcane, reed grass, to straw. Mean rating is 2 highlighting the existence of poor conditions.

Normal reproductive behaviour among adult animals is given high rating. For this parameter, data is limited to a maximum of two animals for some features and no information is available about the male.

Fissures on leg and toe nail cracks are reported for some elephants and injuries on leg, ear and tail for some; vet doctor is available within 2 km from the stud farm. Mean rating related to health status is 8.
Mean rating for socio-economic status of mahout is six which reflects moderate conditions. Overall mean rating, including socio-economic and professional status for mahout is 7 indicating moderate welfare conditions.

Overall mean rating for elephant is 5, reflecting on the poor welfare conditions prevailing with 53% of ratings getting a score less than 5.

Poor welfare at this location maybe attributed to the following conditions as wild elephants are reported to spend 12 to 18 h a day foraging and feeding and may travel several kilometers in the process. Observed captive elephants at the location surveyed are used for commercial purposes, offering tourist rides for 8 to 9 days a month, leaving them without work the rest of the time.

Introduction

The Royal Palace of the erstwhile Maharaja of Mysore has been home to captive elephants for over hundred years. Camps currently run by the Forest Department for captive elephants in some locations were originally set up by than Maharaja of Mysore. Current numbers of elephants maintained by the present successors at the Regency Stud Farm in Mysore Palace environs is vastly reduced, numbering only seven.

Objective

Elephants maintained by the Regency Stud Farm were observed and data was collected to assess the welfare status of its captive elephants and their handlers.

Method

Providing an environment that meets the needs of a highly developed social species such as the elephant associated with a complex ecological requirement of space and food is a challenging task (Veasey, 2006). The deviations experienced by captive elephants in their social, physical, and biological environments have been used to evaluate the welfare of the animals. The greater the deviation from a natural environment, as experienced by wild counterparts, the lesser is the welfare of the animal in captivity.

Captive conditions of the elephant have been assessed covering several aspects such as housing, whether allowed to browse/graze in forest conditions, opportunity for exercise/social interaction, group size, reproductive condition and health status, occurrence of stereotypy, etc. Data was collected through observation of elephants and interview of personnel/management. Each of these features or sub-parameters has been rated on a 0 to 10 scale with 0 representing the worst possible situation and 10 implying a satisfactory state, closer to what an animal experiences in the wild.

Rating values are graded in the following manner:

- 0 to 2.4: bad conditions
- 2.5 to 4.9: poor
- 5.0 to 7.4: moderate
- 7.5 to 10.0: satisfactory

For some sub-parameters such as availability of veterinary doctors, frequency of visits by the doctor, etc., the ideal condition represents ease of access and prevalence of features conducive to maintaining the health of the elephant. Sub-parameters representing a common feature such as shelter or water have been grouped together to form a parameter. Rating for a parameter is the mean of all the sub-parameters.

The welfare status of mahouts/handlers has been assessed by examining the socio-economic parameters and the handler's relationship with his animal in terms of experience, knowledge of commands, etc. Bad or poor handler welfare maybe associated with poor handling of his animal.

Results

Population status

Elephants at the Regency Stud Farm, Mysore Palace, number seven, of which six are females. Their mean age is 30.5 yrs (SE = 5.3, N = 7) with the age of females ranging from 14 to 45 yrs. The single male is aged 20 yrs.

Shelter

- Shelter type is open, with earthen flooring
- Size is 80,729 sq ft
- Chaining duration is 16 to 18 h;13 h for male elephant
- Shade is available for two elephants only

Physical conditions existing within a shelter are of prime importance to captive animals as they determine the nature of facilities provided. The mean rating is 4.6 (SE = 2.2, N* = 4) implying existence of poor conditions. Occurrence of natural conditions within the shelter is given high rating considering the activity of wild elephants. The mean rating is 4.0 (SE = 0.0, N = 7) showing the poor condition of shelter. Occurrence of natural substrates such as earthen floor is given high rating. The mean rating is 10.0 (SE = 0.0, N = 7) indicating suitable substrate.

Rating for space available to the elephant is assigned based on the actual size of the shelter and the size (Figure 1) used by the elephants in the context of being restrained by chaining. The mean rating is 1.3 (SE =0.0, N =7) highlighting the bad conditions existing in terms of space.

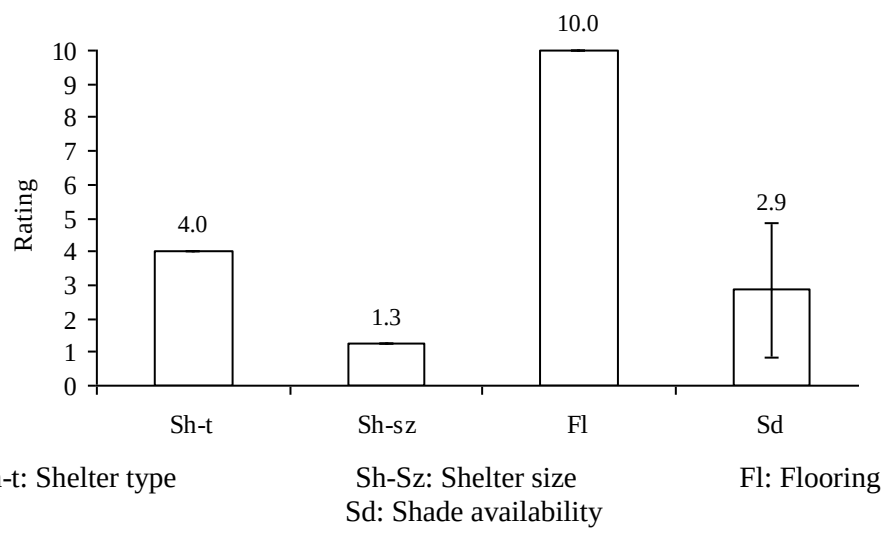


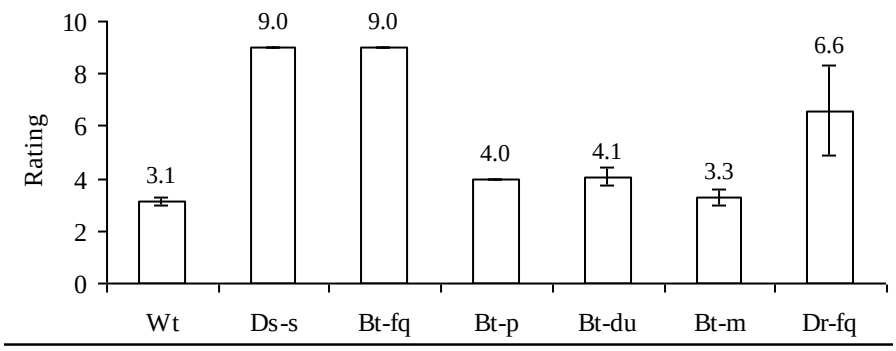
Figure 1: Rating for shelter and related parameters for elephants from Mysore Palace

Water

- Source of water for drinking/bathing for all animals is tap water which is at a distance of 200 m.
- Artificial pond is available, and is used sometimes for bathing.
- Mean number of times drinking water per day is 4.6 (SE =1.2, N = 5).
- Mean quantity of water drinking/day is 150 l (SE = 40.8, N = 4).
- Mean bath duration is 1.0 h (SE = 0.2, N = 6).
- Bathing materials used are brush and pandanus fruit.

Availability of water along with appropriate features for performance of species-specific activities such as drinking/bathing wallowing is given high rating. Mean rating of 5.6 (SE = 1.1, N= 7) indicates the prevalence of moderate conditions (Figure 2) for this parameter. Running water sources available throughout the year have two advantages: relatively less contamination and availability. Mean rating is 3.1 (SE = 0.2, N = 7) showing poor water source.

The number of times water is taken by the elephant has been rated, as an indication of the quantity of intake. Mean rating is 6.6 (SE = 1.7, N = 5) which shows moderate conditions. Provision of a bathing place which allows for performance of species-specific activity is given high rating. Mean rating is 4.0 (SE =0.0, N =7).



Wt: Perennial water source Ds-s: Distance to water source
Bt-fq: Bathing frequency Bt-p: Bathing place
Bt-du: Bathing duration Bt-m: Bathing materials
Dr-fq: Drinking frequency

Figure 2: Rating for parameters of water for elephants in Mysore Palace

Sleep and related features

- All animals rest in palace premises/enclosure
- Shade was available for only two elephants
- Mean sleep duration is 7.0 h (SE = 0.0, N =6)

Access to unrestricted resting/sleeping activity in suitable space is rated. Mean rating is 3.0 (SE = 1.3, N = 3) implying prevalence of poor conditions for this parameter.

Place of sleep is rated considering the occurrence of natural and suitable substrates and provision for unrestricted movement. Mean rating is 4.0 (SE = 0.0, N =7) as the elephants sleep in the enclosure/palace premises (Figure 3) which has suitable earthen flooring but no provision for unrestrained movement.

Kane *et al*. (2005) cite several authors in support of the activity pattern of wild elephants, and are said to be active for nearly 80% of a day. They sleep for 3 to 4 h only (Zepelin *et al*., 2005).

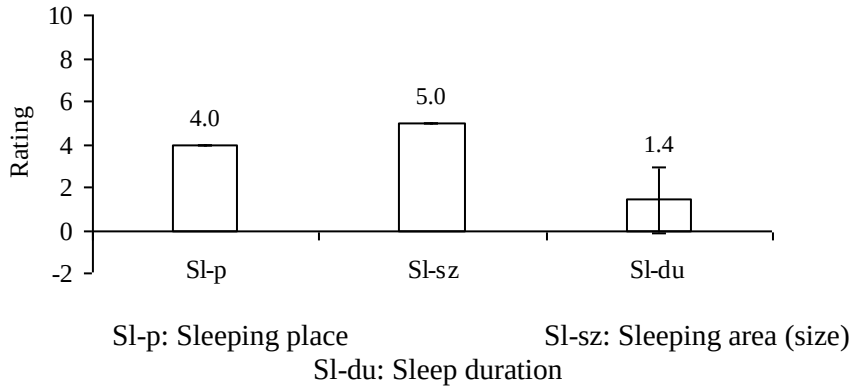


Figure 3: Rating for sleep-related parameters for elephants in Mysore Palace

Walk and social interaction

- All the animals are walked 3 to 4 km surrounding the stud farm.
- Time of walking is 8.30 to 9.30 a.m. and 3.30 to 5.30 p.m.
- Mean distance of walk is 4.1 km (SE = 0.6, N = 7).
- Mean duration is 2.3 h (SE = 0.2, N = 7).
- All the elephants are given opportunity for interaction.
- Number of individuals ranged from 6 to7.
- Distance between animals ranged from 10 to 25 ft.

McKay (1973) states that elephants traverse across varied habitats while foraging. Opportunity provided to captive elephants for walking is rated to provide an insight into the deviation experienced by the animals. All the elephants are allowed to walk; hence the rating of 10.0 for this feature.

Elephants are considered to be highly social animals (Sukumar, 2003), hence, opportunity for expression of species-typical behaviour among con-specifics is rated. Mean rating is 6.0 (SE = 3.7, N =3) indicating occurrence of moderate conditions (Figure 4).

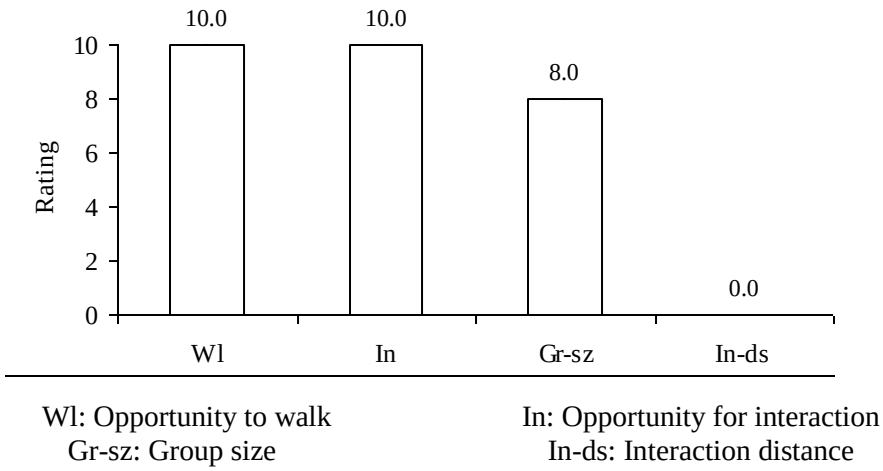


Figure 4: Rating for parameters of walk and social interaction for elephants in Mysore Palace

Chaining

- All the elephants are chained using iron chains
- Chain is tied in the leg region
- Chain weight ranges from 12 to 50 kg; chain length ranged from 6 to 20 ft
- Mean chaining duration is 18.8 h (SE = 0.5, N = 5)
- Neck rope for one elephant is 12 ft in length
- The elephants are not allowed to range free at night

Restricting the movement of captive elephants by chaining imposes limitations on the ability of the animal to express its natural behaviour in different contexts. Mean rating is 0.3 (SE = 0.4, N = 3) highlighting (Figure 5) the existence of bad conditions for this parameter.

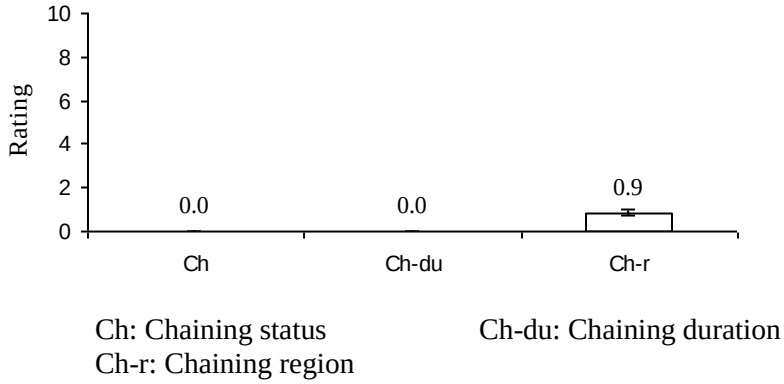


Figure 5: Rating for chaining of elephants and related parameters

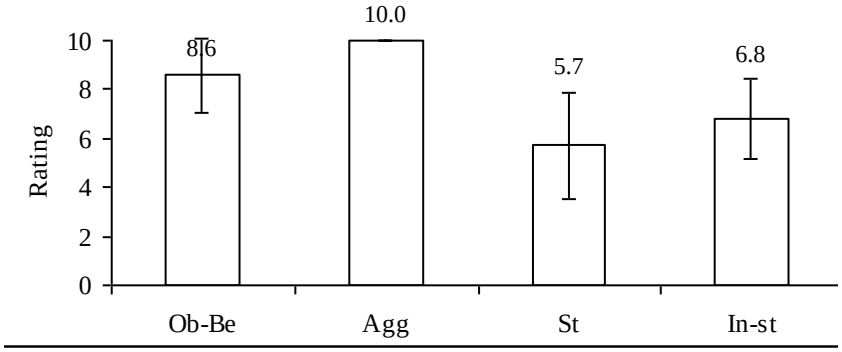
Behaviour

- All the observed elephants are described as calm/predictable
- The male is described as predictable and rough

- Three elephants exhibited stereotypic to and fro movements

The temperament of captive elephants is important not only in terms of handling the animal, but also for the animal itself in terms of its interaction with con-specifics and opportunity for free movement. In addition, the occurrence of stereotypic behaviour has (Figure 6) been considered; it maybe linked to poor welfare and the animal's way of coping with it (Veasey, 2006). Mean rating is 7.8 (SE = 1.1, N = 4).

All the observed elephants are described as being calm, except for the single adult male. Rating is 8.6 (SE = 1.5, N = 7) showing manageable temperament such as quiet/calm. Rating for this feature is 5.7 (SE = 2.2, N = 7) indicating occurrence of stereotypy in some (50%).



Ob-be: Observed behaviour
Agg: Aggression towards people
St: Occurrence of stereotypy
In-st: Intensity of stereotypic behaviour

Figure 6: Rating for behaviour-related parameters for elephants from Mysore Palace

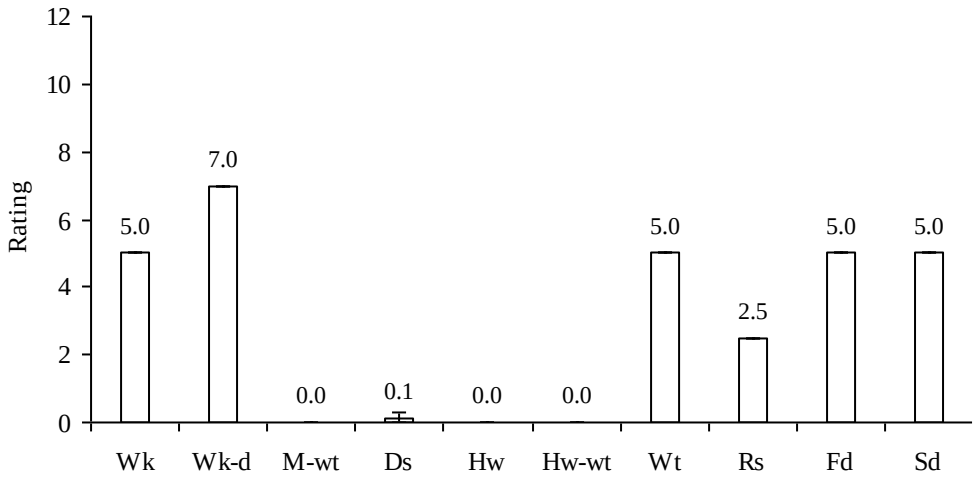
Work

- Work type was carrying tourists, 8 to 9 days/month
- Timings: 10 to 2 p.m., 3 to 6 p.m
- Maximum weight carried is 450 to 500 kg.
- Distance covered is 50 m, 200 to 300 times
- Number of people: 3 to 6, nature of terrain: palace grounds
- Metal howdah used weighs 120 to 50 kg
- Tree shade available during work
- Water available, quantity of water said to be drinking: 7590 l.
- Rest available: 11.5 h
- Food provided during work: tree leaves of different species and green grass 75–80 kg

This has been rated considering the nature of work (performance of un-natural behaviours) and availability of food/water/shade/rest during work. Mean rating for work is 2.96 (SE =0.91, N = 10) implying poor conditions.

Nature of work involves repeated performance of the same activity and hence is given a low rating. Mean rating is 5.0 (SE = 5.0, N= 7). Low rating indicates burdening the animal with weight, repeatedly during the course of work (Figure 7). Rating is 0.0 (SE = 0.0, N =7).

The elephants are given opportunity to rest; however, they cannot choose the resting periods. It is decided by the keepers. Rating is 2.5 (SE = 0.0, N = 7). Provision of water during work is rated based on unrestricted access. Rating is 5.0 (SE = 0.0, N = 7) showing poor conditions.



Wk: Work type Wk-d: Work duration Wt: Maximum weight carried
Ds: Distance covered during work Hw: Howdah type Hw-wt: Howdah weight
Wt: Water availability Rs: Rest availability Fd: Food availability
Sd: Shade availability

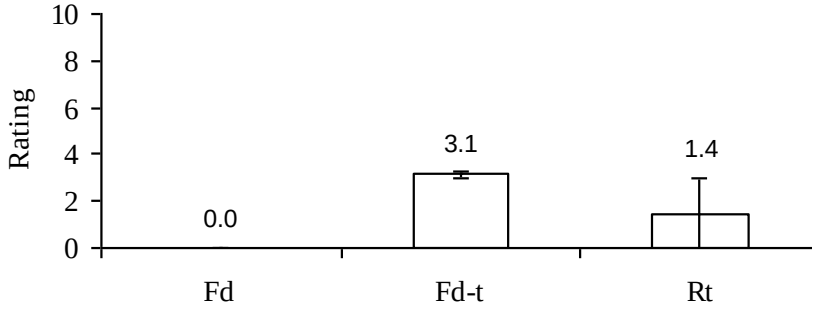
Figure 7: Rating for work for elephants of Mysore Palace

Food provisioning

- All the elephants are only stall-fed
- Feeding area is an enclosure, feeding time: 10 to 11a.m., 5 to 6 p.m
- Food: Paddy, rice, ragi balls, all grams, vegetables, jaggery, green grass, sugarcane, reed grass, straw
- Quantity of food (kg): free leaves 120 to 125, green grass (20), jaggery (raw concentrate) of sugarcane juice) vegetables
- Special food sugarcane- provided during 'Dasara'

Ration chart is used for only one elephant. Provision to range free and availability of diverse types of food through stall-feed are considered along with the maintenance of feeding charts. The mean rating is 1.5 (SE = 1.1, N = 3) highlighting the existence of poor conditions.

- Elephants allowed to range free for foraging and given stall-feed have been given high rating. The mean rating is 0.0 (SE = 0.0, N= 7). Usage of ration chart can assist in planning for the animal's diet according to its health and physiological needs. The mean rating is 1.4 (SE =1.5, N = 7) for food-related parameter (Figure 8).



Fd: Food provisioning type; Fd-n: No. of food items; Rt: Usage of ration chart

Figure 8: Rating for food for captive elephants of Mysore Palace

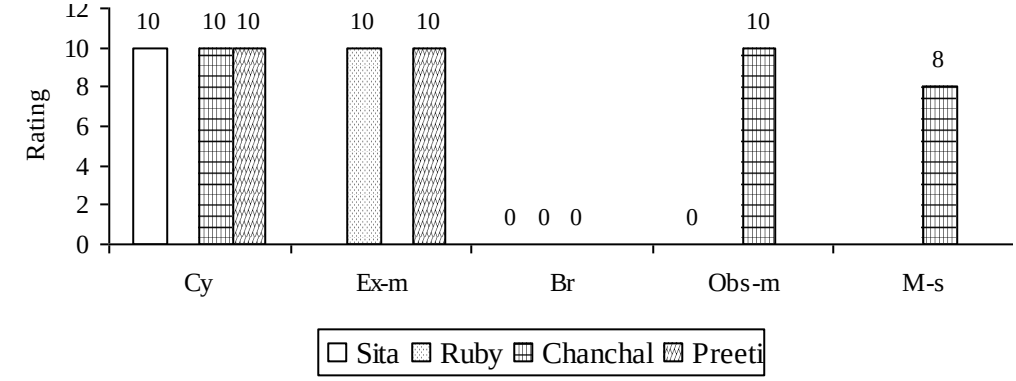
Reproductive status

- Three elephants are reported to be cycling
- Two animals observed to have mated, no offspring

The occurrence of normal reproductive behaviour among adult animals is given high rating. For this parameter, rating for individual elephants has been presented as data is limited to two animals for some features.

No information is available on the male elephant. The rating presented in the figure for reproductive status-related parameters (Figure 9) represents that of four female elephants with their age given below:

Sita: 40 yrs
Ruby: 45 yrs
Chanchal: 30 yrs
Preeti: 20 yrs



Cy: Occurrence of oesrtus cycles Ex: Exposure to males
Br: Breeding success Obs-m: Mating observed/not
M-s: Male source

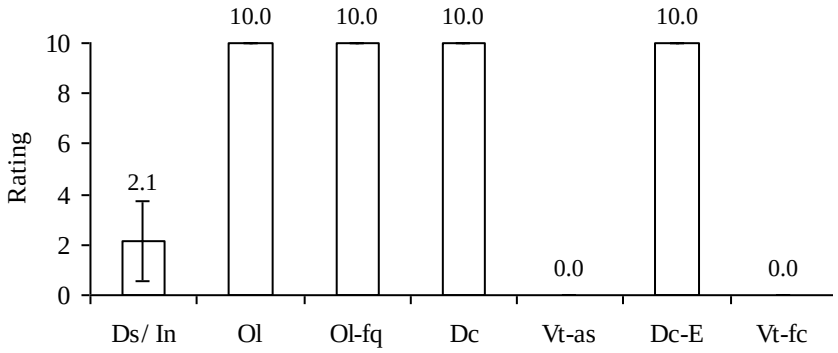
Figure 9: Rating for reproductive status-related parameters for captive elephants of Mysore Palace

Health status and veterinary care

- Fissures on leg and toe nail cracks reported for two elephants
- Injuries on leg, ear and tail for three elephants
- No signs of harsh handling
- Oiling is done for all the elephants on the head and legs, once daily,
- Head—Castor oil, Leg—Neem oil
- Doctor available for all observed elephants, located 2 km from the stud farm
- Veterinary assistant or clinic facility not available

This parameter considers disease/injury occurrence as well as practices followed in maintaining health. Mean rating is 7.6 (SE =2.9, N = 3). Availability of veterinary care is rated based on access to veterinary doctor, assistant, experience of the doctor and facilities. Mean rating is 5.0 (SE= 3.3, N = 4). Rating is 2.9 (SE = 2.0, N = 7) with five of the seven elephants said to have injuries on various parts of the body. Two elephants also seem to have foot-related problems.

The rating is 10.0 (SE = 0.0, N = 7) showing that all the practices (Figure 10) are followed for all the elephants. All the elephants have access to a veterinary doctor, hence, the rating is 10.0 (SE= 0.0, N =7) for this sub-parameter. There is no provision for clinical facility for the animals. Hence, the rating is 0.0 (SE = 0.0, N =7).



D/In: Disease/Injury occurrence Ol: Oiling done
Ol-fq: Frequency of oiling Dc: Availability of veterinary doctor
Vt-as: Availability of veterinary assistant Dc-E: Veterinary doctor's experience with elephants
Vt-fc: Availability of veterinary clinic facility

Figure 10: Rating for health and veterinary care-related parameters of captive elephants of Mysore Palace

Welfare status of the mahout

- Mean age of mahouts is 26.4 yrs (SE =2.3, N = 7)
- Mean experience in the profession is 14.7 yrs (SE =5.9, N = 6)
- Mean experience with the present elephant is 6.7 yrs (SE =2.1, N = 6) ranging from 4 to 40 yrs

- All the mahouts, except one who took up work as he was poor, had joined the profession as it is traditional occupation for them
- Six mahouts belong to Muslim or Jenu Kuruba community; training was given for six mahouts
- Mean salary per year is Rs.32,092 /- (SE =2149.6, N = 6)
- Education ranged from 1st standard to 7th standard
- Two mahouts did not have accommodation facility
- All the mahouts (N = 6) were married with 1 to 3 children. All the mahouts knew two to three languages
- Six mahouts use wooden ankush and one uses ankush and stick
- Only one mahout had a health check-up
- None of the mahouts had insurance cover
- Only one mahout consumes alcohol

Welfare of mahout/cawadi (Figure 11) has been assessed based on his/her socio-economic status. Mahout/cawadi's professional status has also been rated in terms of experience, knowledge of commands and reason for choosing this profession.

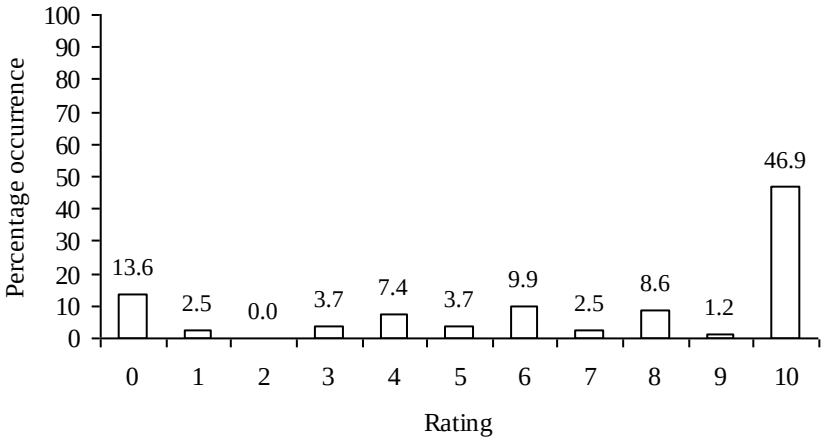
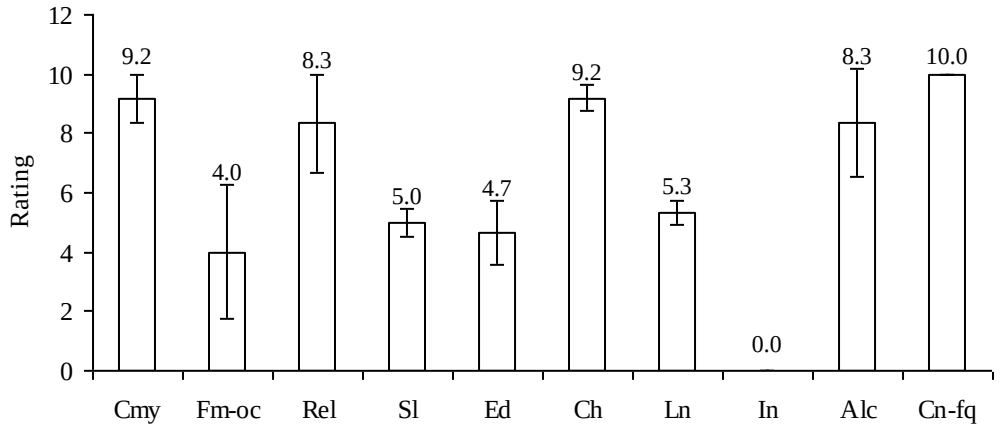


Figure 11: Percentage occurrence of overall rating for mahout welfare-related parameters for captive elephants in Mysore Palace

Mean rating for socio-economic status is 6.4 (SE = 0.5, N = 58) which indicates the existence of moderate conditions (N refers to the number of individual ratings considered across all the sub-parameters).

The mean rating for education (Figure 12) is 4.7 (SE =1.1, N = 6) as the maximum level of education is only the seventh standard. High rating is given for wages capable of supporting a family of four in an urban environment. The mean rating is 5.0 (SE = 0.5, N = 6) and only three of the mahouts get a maximum rating of 6. Low rating is given to mahouts who consume alcohol. The mean rating is 8.3 (SE= 1.8, N= 6) with five of the six mahouts do not consume alcohol.

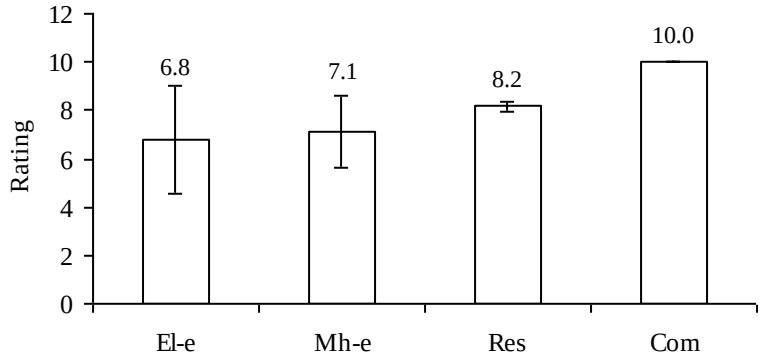


Cmy: Community of mahout Fm-oc: Family occupation Rel: Having mahout relatives
Sl: Salary given Ed: Education status Ch: Number of children
Ln: Number of languages known In: Insurance cover availability
Al: Alcohol consumption Cn-fq: Consumption frequency

Figure 12: Rating for socio-economic parameters for mahouts.

The mahout's professional status is rated based on the handler's experience with particular elephant or in the profession. The mean rating is 8.1 (SE = 0.6, %CV = 34.8, *N*** = 23) showing satisfactory conditions (*N*** refers to the number of individual ratings across each of the sub-parameters observed).

Higher rating implies greater experience in this profession (Figure 13), calculated as percent of mahout's age. Mean rating is 6.9 (SE = 1.6, N = 4) showing prevalence of moderate conditions. Higher rating value indicates more experience with the elephant being observed, with experience being calculated as per cent of the elephant's age. The mean rating value is 7.0 (SE = 1.8, N = 5) showing occurrence of moderate conditions for this sub-parameter.



Ex-A: Experience as % of mahout's age Ex-E: Experience as % of elephant's age
Res: Reason for choosing this profession Com: Knowledge of commands

Figure 13: Rating for professional status of mahouts of captive elephants of Mysore Palace.

The overall mean rating, including socio-economic and professional status, for mahout is 6.9 (SE = 0.4, N = 81) indicating occurrence of moderate welfare conditions (N refers to the number of individual ratings across all the sub-parameters observed). Ratings less than 5 indicate poor welfare conditions. This was seen for the following sub-parameters (Figure 14):

- Salary paid to the mahouts (Mean = 5.0, SE = 0.5, N = 6) which ranged from Rs. 28,000 to 38,700/- p.a.
- Absence of insurance cover for any of the mahouts.

The overall mean rating for elephants is 4.6 (SE = 0.2, N** = 326, where N** refers to each individual rating across all the parameters assessed). This rating reflects poor welfare conditions with 53% of ratings getting a score less than 5.

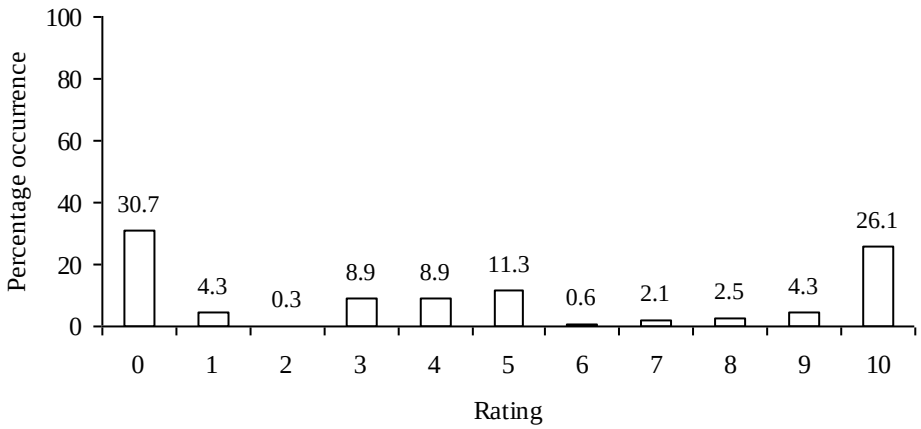


Figure 14: Percentage occurrence of overall rating for elephants.

Discussion

The deviation between the knowledge gained from wild elephant studies and the existing captive situation has been used to assess welfare of captive elephants. The overall mean rating is 4.6; it reflects on poor welfare conditions with 53% of ratings scoring less than 5.

Poor welfare at this location maybe attributed to the following:

- Wild elephants are reported to spend 12 to 18 h a day foraging and feeding (Sukumar, 2000) and travel several kilometers in the process.

  Observed captive elephants at the location surveyed are used for tourist rides for 8 to 9 days a month, leaving them without any perceptible work the rest of the time. Stall- feed may reduce their need to forage; however, the absence of any activity for most parts of a day may have deleterious effect on the animals. Added to this, the elephants are chained at one place for nearly 12 to 18 h using chains of 15 to 20 ft in length, imposing restriction on their movement. Chaining increases frequency of stereotypy (Gruber *et al.*, 2000). Co-incidentally, three of the seven elephants exhibit stereotypic to and fro movements.

- Elephants are highly social animals, maintaining their association with other elephants across generations (Sukumar, 2003).

The observed elephants are allowed social interaction among each other offsetting the benefit by the practice of chaining them thus restricting their ability to move and interact freely, especially considering the possibility of negative interactions. Also, the use of the animals for tourist rides for nearly seven hours meant reduced time for interaction.

- Elephants forage on a variety of plants (Mckay, 1973) using different parts of their body to prepare this food (Kurt and Garai, 2007).

The elephants are not allowed to range free to forage and are provided only stall-feed. This practice will not provide the diverse plant types which free-ranging animals have access to. Also, stationary feeding does not provide the exercise which these large-bodied animals need while foraging.

- Clubb and Mason (2002) state that lack of normal reproductive functioning could be linked to stress among the animals or harsh handling, among other physiological factors. Learning is an important aspect for social animals in the context of mating and care of offspring (Poole and Moss, 2008).

None of the observed female elephants, for which data is available, has given birth to offspring despite showing signs of oestrus or being allowed to mate.

Features of husbandry not conducive to elephant welfare:

- Use of metal howdah to provide rides for tourists. Kurt and Garai (2007) report of the ill-effects of using chains on the skin of elephants. Metal howdahs may lead to abrasion-related injury and cause discomfort during high ambient temperatures.
- Repeated performance of same behaviour within unchanging environs due to the practice of walking the elephants during rides, reportedly for 200 to 300 times/day.
- Absence of running water facility with suitable space for elephants to engage in natural behaviour such as immersing in the water/mud wallowing.

References

1) Clubb, R. and Mason, G. (2002). A review of the welfare of zoo elephants in Europe: A report commissioned by the RSPCA. Oxford, U.K., University of Oxford, Animal Behaviour Research Group, Department of Zoology.
2) Gruber, T.M., Friend, T.H., Gardner, J.M., Packard, J.M., Beaver, B. and Bushong, D. (2000). Variation in stereotypic behaviour related to restraint in circus elephants. Zoo Biology 19: 209-221.
3) Kane, J.D.L., Forthman, D., and Hancocks, D. (2005). Optimal Conditions for Captive Elephants: A Report by the Coalition for Captive Elephant Well-Being.
4) Kurt, F. and Garai, M.E. (2007). The Asian elephant in captivity—a field study. Foundation books, Cambridge University press, New Delhi.
5) McKay, G.M. (1973). Behavior and Ecology of the Asiatic Elephant in Southeastern Ceylon. Smithsonian Institution Press, City of Washington.

6) Poole, J.H. and Moss, C.J. (2008). Elephant sociality and complexity The scientific evidence. In: Elephants and ethics toward a morality of coexistence (Eds: Wemmer, C and Christen, C. A) The John Hopkins University Press, Baltimore. (Accessed online: http://www.elephantvoices.org/index.php?topic= tools&topic2=tools/documents/2_Poole_Moss_Final_7_12_06.pdf).
7) Stroud, P.C. (in press). Chapter 8. Tradition, Biology and Morality in Captive Elephant Management, In: An Elephant in the Room: the Science and Well Being of Elephants in Captivity. pp: 99–108. (Referred online http://www.loudmonks. com)
8) Sukumar, R. (2000). Asian Elephant (*Elephas maximus*). In: Reading, R.P. and Miller, B. (eds.). Endangered Animals: a reference guide to conflicting issues. Greenwood Press, Westport, Connecticut, London, pp. 34–39.
9) Sukumar, R. (2003). The living elephants. New York: Oxford University Press.
10) Veasey, J. (2006) Concepts in the care and welfare of captive elephants. Int. Zoo Yb. 40: 63–79
11) Zepelin, H., Siegel, J.M. and Tobler, I. (2005). Mammalian Sleep. Accessed online: http://www.npi.ucla.edu/sleepresearch/Mammalian_Sleep.pdf

Section 6:
Captive Elephants under Private Ownership in Kerala

Executive summary

Elephants traditionally owned by big landlords in Kerala have changed to individual ownership along with a shift in predominant work type from timber to use in festivals. Kerala has the maximum number of privately owned elephants (72%), with an owner to elephant ratio of 1:1.5.

The welfare status of elephants kept under private ownership in Kerala was assessed based on a rating scale. The rating scale from unsuitable conditions to suitable conditions was used to assess the welfare status of captive elephants and their handlers.

The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter, defined as Experts' Rating (E-R). Mean Rating (M-R) representing the actual situation existing for the elephant/s was obtained through the ground survey. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm.

The investigation was carried out for 44 elephants (41 males, 3 females); belonging to 25 owners. Number of elephants per owner ranged from 1- 11, most owners (N= 17) maintaining one elephant only. Age of males ranged from 5-60, female age ranged from 27-40 yrs.

All elephants were purchased from different sources, across six states: Kerala, Bihar, Assam, Karnataka, Uttar Pradesh and Andaman. Most elephants were purchased from Kerala (12) followed by Bihar (11); sourcing of elephants from Kerala may also include those elephants originally acquired from other regions, but having been sold/ gifted across owners within Kerala. M-R was 1.5 (SE= 0.0, N= 43) showing a deviation of 75% from E-R.

All elephants were maintained for use in festivals/ processions/ religious functions. M-R was 0.3 (SE= 0.1, N= 39) indicating a deviation of 96% from E-R.

Sixty nine percent of elephants were kept in open type of shelters exposing the elephants to summer heat/ monsoon rain; a shed was provided for some. Shelter size ranged from 405- 8, 09,400 $km^{2,}$ but the space where elephant was tied/ kept ranged from 0.000009- 0.0000372 km^2.

The elephants spent an average of 19h (ranging from10- 24h) within this space during off-season (when not working); mean hours outside shelter was 6h (ranging from 0 – 24) either for work or for bathing/ bringing fodder. One male elephant (42.5y) was used for work in the neighboring state of Kerala and kept in the shelter with owner from January to April. M-R was 4 implying a deviation of 47% from E-R.

Ninety five percent of the elephants were provided with water from bore well/ open well/ tap water, including those which provided more than one source of water. 62% owners provided more than one source of water. 48% elephants had access to rivers/ streams/ canals as a source of water. Distance to water source ranged from within the enclosure to 3-4 km.
Bath frequency varied from daily or once in two days to once a week and 42% elephants were bathed within their enclosure. Bathing materials used as scrub were: coconut husk, pieces of concrete, ceramic stones. M-R was 3 with a deviation of 63% from E-R.

Interaction among elephants was dependent on presence of other elephants with a single owner: during off-season interaction was unlimited with owners having more than one elephant; while working, elephants were subject to work schedule.

Mean number of elephants maintained during off-season, per owner, was 3 (ranging from 1-10), 68% owners maintained only male elephants (N= 19); while working, the number of elephants per festival/ program, was varied. Mean duration of interaction was 9.5h (ranging from 0-24h); 56% of the elephants were allowed less than 10h of interaction. M-R was 5 with a deviation of 39% from E-R.

All elephants were chained using a plain type chain. Chaining duration ranged from 18 – 24 hrs during off-season. Eight percent of the elephants were allowed to free range; none of the observed elephants was allowed to free range at night. M-R was 0.9 showing a deviation of 88% from E-R.

Sixty seven percent of the elephants were described as quiet/ reliable. Of the three female elephants, a 35 yrs old elephant was reported to be aggressive towards mahouts/ strangers and other animals. Twenty seven percent of the elephants were reported to exhibit stereotypic behaviours such as head/ body swaying of medium to low intensity. M-R was 6 indicating a deviation of 31% from E-R.

Fifty one percent of elephants were used for festival work, only 2% of the elephants were used for timber related work, remaining were used for both. Festival work type involved parades/ temple rituals/ processions.

Mean number of working days was 60 (ranging from 12- 315); working season was throughout the year from January-April/ February - March/ August - November/ August - April or May or October/ December - April or May.

Mean distance to working place was 100 km (ranging from 0 – 500 km). Mean distance to working place covered by foot was 39 km (ranging from 15-125 km). Mean distance to working place covered by vehicle was 228 km (ranging from 45-1000 km).

Remuneration per festival per elephant ranged from Rs.2000-3500/- and 70% of the elephants did not have access to shade while working. Twenty one percent of elephants did not have access to water; only 5% were not given rest and all were given food while working but with restricted time for consuming the food. M-R was 4 showing a deviation of 56% from E-R.

Only 7% of the elephants were given both stall feed and allowed to free range to forage. Food provided was: *Caryota* leaves, other palm leaves, sugarcane (*Sacharum* sp.), rice (*Oryza sativa* grains), Bananas (*Musa* sp.), Jaggery (sweet derived from sugarcane), *Erythrina* sp. leaves, grasses, ragi (*Eleusine coracana*).

Food provided during musth period was *Curd* rice (cooked rice grains with yoghurt), water-melon (*Citrullus lanatus*), cucumber (*Cucumis sativus*), Banana stems, *sago* (starch from *Metroxylon sagu*), Rice flakes with banana

Rice with turmeric (cooked rice grains with turmeric— *Curcuma longa* powder)/ rice flakes with curry leaves (*Muraya koenigii*) was given for timber work; ayurvedic powders, dates (*Phoenix dactylifera)*, banana, rice flakes was given for rejuvenation. M-R was 1.4 (SE= 0.9, N*= 6) showing a deviation of 83% from E-R.

The occurrence of oestrus cycles among the three female elephants was not known. Physical contact with male elephants was not allowed. 14% of adult male elephants were not exhibiting musth signs.

Chaining and watering of musth elephants was practiced. 60% of the elephants had exhibited signs of aggression towards people/ other animals while in musth. Fifty three percent of the elephants had not sired offspring (N= 19), status was not known for the rest. M-R was 4 showing a deviation of 57% from E-R.

Four elephants, all aged 40-43y, were reported to be blind in one eye. Among these, a 40 yrs old elephant was blind in both eyes. Ten elephants had foot related injuries: leg wounds/ toe nail cracks. Kidney problems/ impaction/ tusk infection were the other health issues recorded. One elephants had a broken tail bone after being hit by a vehicle

Samples of blood/ urine/ dung were not tested for any of the elephants. Body measurements were taken for only 33% of the elephants. M-R was 3 indicating a deviation of 68% from E-R.

All elephants had access to a veterinary doctor, years of experience ranged from 5- 35 yrs. Frequency of visits was on call. Distance from elephant location to doctor's place ranged from 10- 200 km. M-R was 6 showing a deviation of 26% from E-R.

Mean experience for elephant handlers in this profession was 19 yrs ranging from 1-35 yrs. Mean experience with a specific elephant was 4.1 yrs, ranging from two months to 24 yrs. Ninety percent of handlers opted for this profession out of interest. M-R was 6 implying a deviation of 26% from E-R.

Sixty seven percent of handlers' family occupation was not related to handling elephants— *coolie* (laborer)/ agriculture was the family occupation. Mean annual salary was Rs. 43,000/- ranging from Rs. 14,000 to 80,000/- and only 25% of handlers were covered by insurance.
All handlers used tools to control their elephant: Wooden ankush with metal spike, stick, stick with an iron nut around, long pole (*valiyakol*). Mean number of elephants each handler had worked with was 7.0 (ranging from 2- 35). Fifty percent of the handlers consumed alcohol, after work / on alternate days/weekly/occasionally. M-R was 4 indicating a deviation of 47% from E-R.

Introduction

Maintenance of a large number of captive elephants by single owners, in Kerala, became rare following the ban of timber extraction from forests and consequent absence of work in the timber industry (Lair, 1997, citing other authors). Also, elephants traditionally owned by big landlords appear to have changed to individual ownership along with a shift in predominant work type from timber to use in festivals (*op. cit.*). A study of captive elephants in Kerala found maximum ownership of captive elephants by private individuals (72%), with an owner to elephant ratio of 1:1.5 (Easwaran, Pers. Comm). Economic considerations among owners may impose restrictions on the way elephants are maintained, keeping in mind the cost of maintaining the animal along with its handler/s.

Objective

Living conditions provided for elephants in captivity may vary with each owner, dependent upon constraints and priorities of the owner. Handlers, who are integral to the maintenance and care of such elephants, are also dependent on the conditions existing in their work-place; poor economic status/ lack of professional experience may affect motivation levels, expertise or interfere with handler-elephant relationship. This report aims to:

- Assess the physical, biological and veterinary features provided to elephants in captivity
- Assess the professional experience and socio-economic status of handlers (mahouts/ cawadis)

Method

Elephants have been maintained in captivity for thousands of years, yet have never been selectively bred for specific traits suitable for captive conditions. Thus, the ecological and behavioural needs of captive elephants are on par with those of their wild counterparts. Absence of features (biotic and abiotic) experienced in the wild may cause stress and poor welfare for captive elephants.

The welfare status of elephants has been rated based on the deviation experienced in captivity: the greater the deviation, the lesser the rating and poorer the welfare of the elephants.

The rating method

A team of experts, from wildlife biologists to welfare activists, rated different parameters of importance to the welfare of captive elephants (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). This rating was then used to assess the welfare status of elephants and mahouts/ cawadis.

- Experts from different fields rated a total of 114 welfare parameters covering all the major aspects of captivity
- The rating scale was from zero (unsuitable conditions) to ten (suitable conditions). Experts used different maxima based on their concept of importance of a particular parameter to an elephant. A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e., for a parameter with 8.0 as the maximum value, only 2.0 (25%) deviation from the prescribed norm is considered acceptable.

- Using the maxima given by experts as a base, a rating scale, starting from zero to the particular maximum value for that parameter, has been used to rate the welfare status in this report. This forms the Mean rating (M-R) denoting welfare status of existing conditions for the particular parameter.
- The experts rated 114 different parameters. In this report, variables which represent a common feature of the captive situation have been grouped to form a parameter. The variables have been termed sub-parameters. For example: the variables, shelter type, shelter size, floor type in the shelter represent different aspects of the physical space provided to the elephant. Hence these are grouped together to form the parameter "Shelter" and each constituent variable is the sub-parameter. In this report, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters.
- M-R for a particular parameter (say, shelter) has been obtained by averaging the rating given for each sub-parameter. The rating for each sub-parameter is based on the existing conditions for the elephants.
- Graphs have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the sub-parameters observed. The difference between E-R and M-R (expressed as percentage) indicates the extent of deviation from the acceptable standards as suggested by experts.
- N* refers to number of sub-parameters for an observed parameter. N refers to the total number of parameters/sub-parameters observed.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate the professional/ socio-economic status, of value to the handler and his elephant.

Results

Twenty five owners maintained 44 elephants (41 males, 3 females); number of elephants per owner ranged from 1- 11, most owners (N= 17) maintaining one elephant only. Age of males ranged from 5-60, female age ranged from 27-40 (Figure 1).

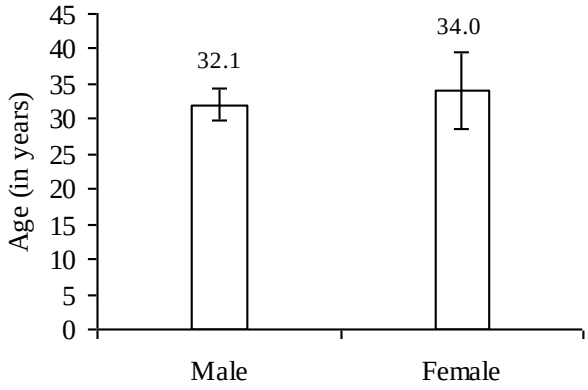


Figure 1: Mean age of elephants with private owners

Source

Shifting elephants across managements implies change in living conditions for the animals with different daily routines to be learnt and performed with possible change in handlers also. This can be a source of stress for the animals.

- All elephants were purchased from different sources, across six states: Kerala, Bihar, Assam, Karnataka, Uttar Pradesh and Andaman.
- Most elephants were purchased from Kerala (12) followed by Bihar (11); sourcing of elephants from Kerala may also include those elephants originally acquired from other regions, but having been sold/ gifted across owners within Kerala.

M-R was 1.5 (SE= 0.0, N= 43) showing a deviation of 75% from E-R.

Purpose

Keeping elephants for income generation will involve a conflict in priorities for the owner: income generated from the work preformed versus opportunity for the elephant to express its species-typical behaviours in a natural environment. Thus, commercial use of elephants has been given low rating.

- All elephants were maintained for use in festivals/ processions/ religious functions

M-R was 0.3 (SE= 0.1, N= 39) indicating a deviation of 96% from E-R.

Shelter

The physical space inhabited by wild elephants is vast, ranging from 250-1000km^2 (Sukumar, 2006), considering the distances traversed by them in search of food/ mates. Captive spaces are restricted, characterized by absence of vegetation and/ or restraining elephants by chaining.

- 69% of elephants were kept in open type of shelters exposing the elephants to summer heat/ monsoon rain; a shed was provided for some
- Of the elephants, only 7% had concrete flooring for one half of a day; the rest had earthen floors
- The elephants spent an average of 19h (ranging from10- 24h) within this space during off-season (when not working); mean hours outside shelter was 6h (ranging from 0 – 24) either for work or for bathing/ bringing fodder. One male elephant (42.5y) was used for work in neighboring states and kept in the shelter with owner from January to April.
- 10% of the elephants (N= 42) did not have access to shade; shade type ranged from roofed shed to partial tree cover
- Shelter was cleaned one of three to three times a day for dung/ urine removal

M-R was 4.3 (SE= 1.5, N*= 7) implying a deviation of 47% from E-R. Figure 2 and 3 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

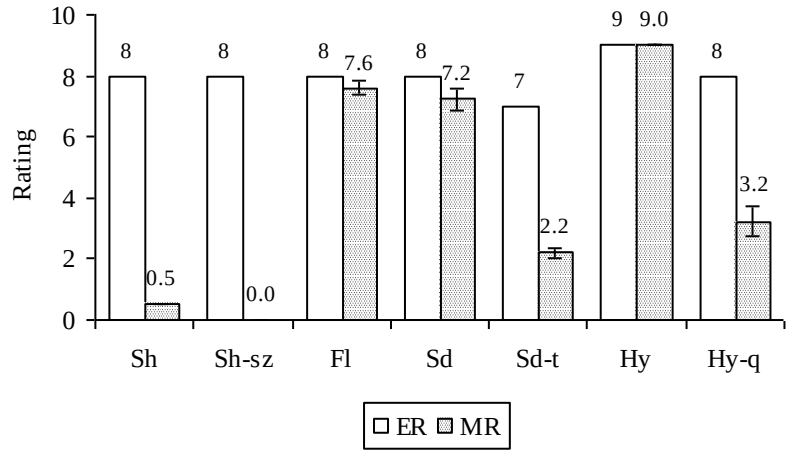
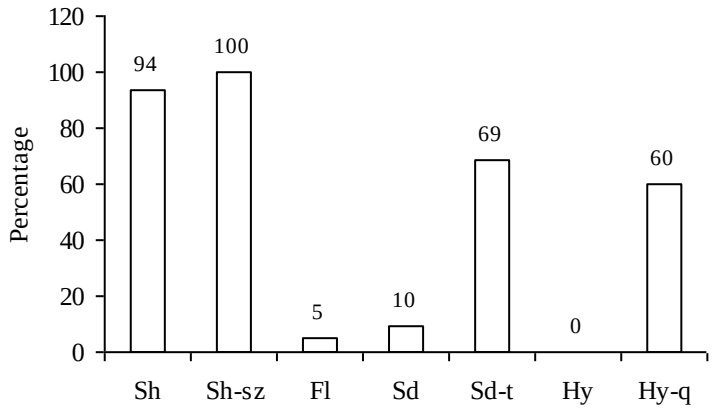


Figure 2: Comparison of E-R and M-R for 'shelter' sub-parameters



Sh: Shelter type Sh-sz: Shelter size Fl: Floor Sd: Shade availability
Sd-t: Shade type Hy: Maintenance of hygiene Hy-q: Quality of hygiene maintenance

Figure 3: Percentage wise deviation from E-R for 'shelter' sub-parameters

Water

Elephants may consume 200-250L of water/ day (Cheeran, 2009), wild elephants have been observed to spray water/ mud on their body or bathe. Hot weather conditions prevailing in a region and restricted movement of captive elephants make the provision of water an important feature for maintenance of health and well-being.

- 95% of the elephants were provided with water from bore well/ open well/ tap water (N= 42), including those which provided more than one source of water. 62% owners provided more than one source of water. 48% elephants had access to rivers/ streams/ canals as a source of water
- Distance to water source ranged from within the enclosure to 3-4kms
- Number of times allowed to drink water varied from twice to 4-5 times/ day
- Water quality analysis was not done by any of the owners

- Bath frequency varied from daily or once in two days to once a week
- 42% (N= 36) elephants were bathed within their enclosure
- Mean bath duration was 2.6h (ranging from 1-4h)
- Bathing materials used as scrub were: coconut husk, pieces of concrete, ceramic stones

M-R was 3.0 (SE= 1.0, N*= 5) with a deviation of 63% from E-R. Figures 4 and 5 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

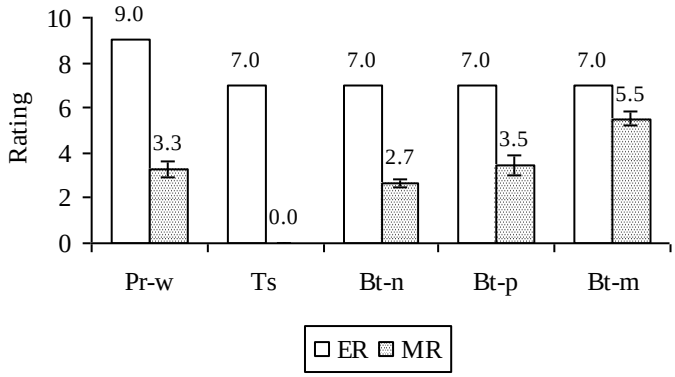
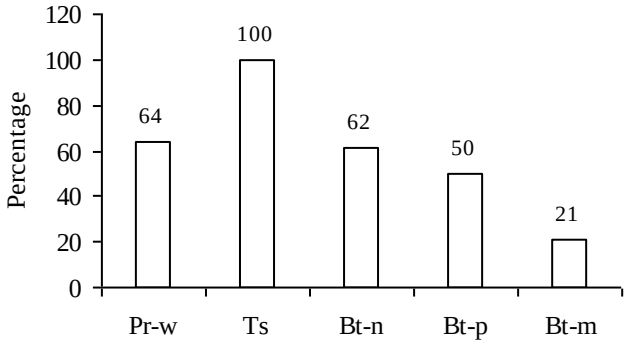


Figure 4: Comparison of E-R and M-R for 'water' sub-parameters



Pr-w: Availability of perennial source of running water
Ts: Water quality tests Bt-n: Number of times bathed
Bt-p: Bathing place Bt-m: Bathing materials

Figure 5: Percentage wise deviation from E-R for 'water' sub-parameters

Sleep

Elephants have been observed to sleep for a period of 3-4h at night (Kurt and Garai, 2007). Sleep duration that is greater/ lesser than this period may indicate abnormality or absence of activity for the elephant to keep itself occupied. Physical conditions of the sleep area, if unsuitable, can have health consequences.

- Sleeping area was the shelter during off-season/ various places while working
- Size of sleeping area was the same as the shelter during off-season (0.000009- 0.0000372 km^2)

- Mean sleep duration off-season was 5.6h (ranging from 3.5-9h); while working mean sleep duration was 4.8h (ranging from 3.5-6h)
- The elephants rested for a mean duration of 10.6h (ranging from 3-24h) during off-season; while working this duration was 5.3h (ranging from 3-8h)

M-R was 1.5 (SE= 1.5, N*= 3) with a deviation of 81% from E-R. Figures 6 and 7 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

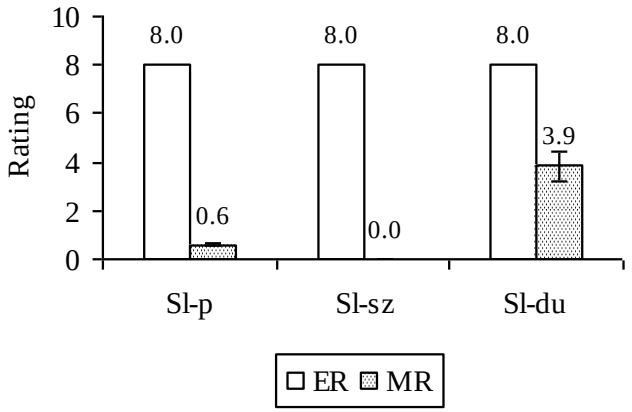
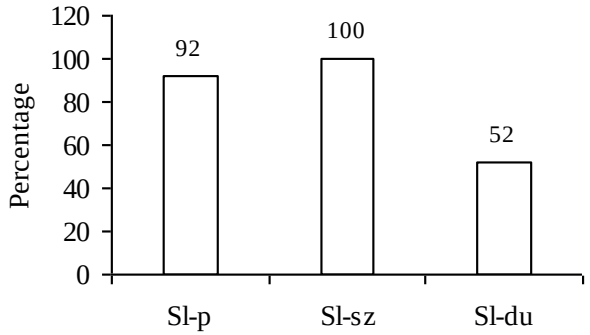


Figure 6: Comparison of E-R and M-R for 'water' sub-parameters



Sl-p: Sleeping place Sl-sz: Sleep area (size) Sl-du: Sleep duration

Figure 7: Percentage wise deviation from E-R for 'water' sub-parameters

Walk

Elephants have been observed to traverse several kilometers a day (Poole and Granli, 2009), with males in musth covering greater distances than when in non-musth (Fernando et al., 2008). This implies the necessity for elephants to be given the opportunity to walk on suitable surfaces.

- 15% (N= 40) elephants were not given an opportunity to walk (includes one male which was walked during work only)
- Distance covered while walking varied from 2-3km (off-season) to 25-30kms (work)

- Time of walking was at various times of the day/ night with nature of terrain varying from slopes to tar roads
- Mean walk duration was 2.4h (ranging from 0.5-6h)

M-R was 3.5 (SE= 2.6, N*= 3) showing a deviation of 61% from E-R. Figures 8 and 9 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

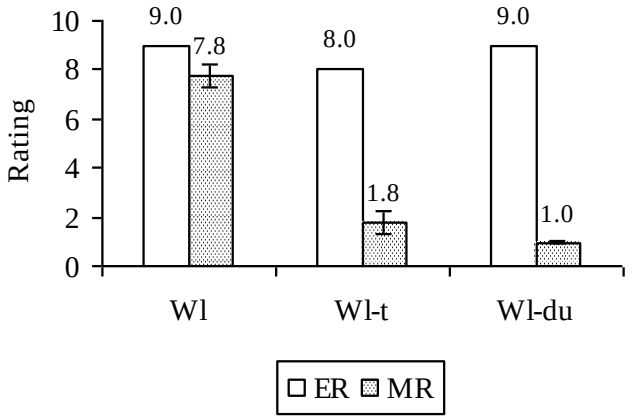
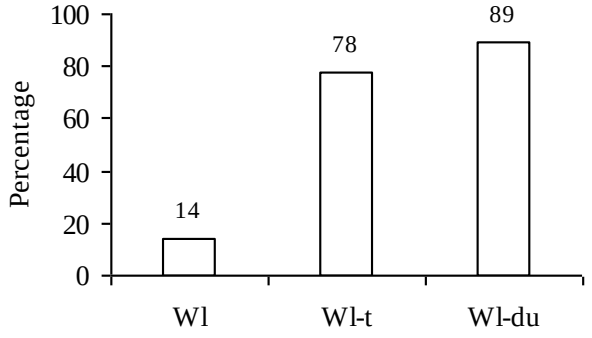


Figure 8: Comparison of E-R and M-R for 'walk' sub-parameters



Wl: Opportunity to walk Wl-t: Time of walk Wl-du: Walking duration

Figure 9: Percentage wise deviation from E-R for 'walk' sub-parameters

Social interaction

Matriarchal society of elephants is a documented fact (Sukumar, 2006); males may form bachelor herds or wander alone (Poole and Granli, 2009); males have been observed in non-aggressive interactions in the wild (McKay, 1973). The presences of males in captivity need not imply absence of interaction with other elephants.

- 2.4% of the elephants were not allowed social interaction (N= 42)

- Mean duration of interaction was 9.5h (ranging from 0-24h); 56% of the elephants allowed less than 10h of interaction
- Interaction was dependent on presence of other elephants with a single owner: during off-season, interaction was unlimited with owners having more than one elephant; while working, elephants were subject to work schedule
- Mean number of elephants maintained during off-season, per owner, was 3 (ranging from 1-10), 68% owners maintained only male elephants (N= 19); while working, the number of elephants per festival/ program, was varied

M-R was 4.9 (SE= 1.7, N*= 4) with a deviation of 39% from E-R. Figures 10 and 11 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

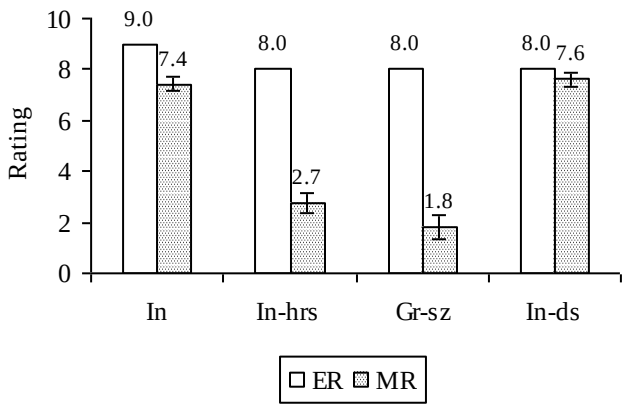
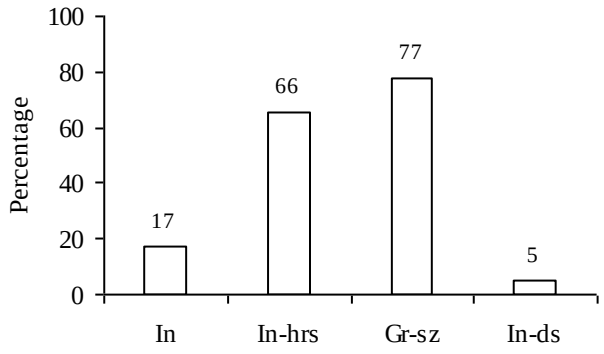


Figure 10: Comparison of E-R and M-R for 'interaction' sub-parameters



In: Opportunity for social interaction In-hrs: Interaction hours Gr-sz: Group size
In-ds: Interaction distance (between elephants)

Figure 11: Percentage wise deviation from E-R for 'interaction' sub-parameters

Chaining

Movement of elephants in captivity is restricted by the use of chains of various kinds on different parts of the animal's body. This practice of chaining has consequences on the welfare of the elephant through its ability to restrict/ prevent expression of species-typical behaviours.

- All elephants were chained using a plain type chain; 69% (N= 39) were chained by the leg, body and hobbled by their feet. Figure 12 gives the dimensions of each chain type
- Chaining duration ranged from 18 – 24h during off-season; only one elephant was chained for only 2-3h during off-season; chaining duration while working varied from 2-15h
- 8% of the elephants (N= 24) was allowed to free range; none of the observed elephants was allowed to free range at night

M-R was 0.9 (SE= 0.9, N*= 5) showing a deviation of 88% from E-R. Figures 13 and 14 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

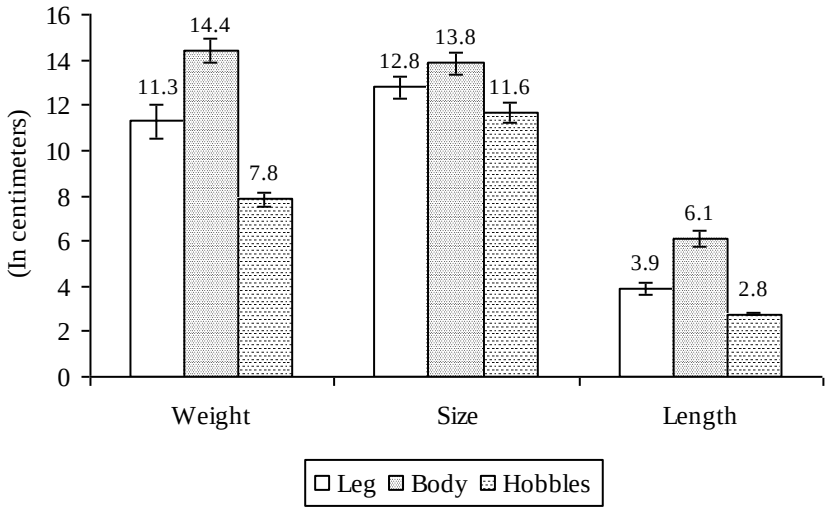


Figure 12: Dimensions of chain types

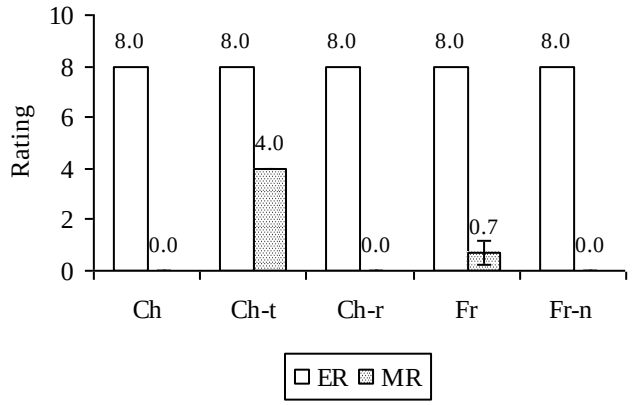
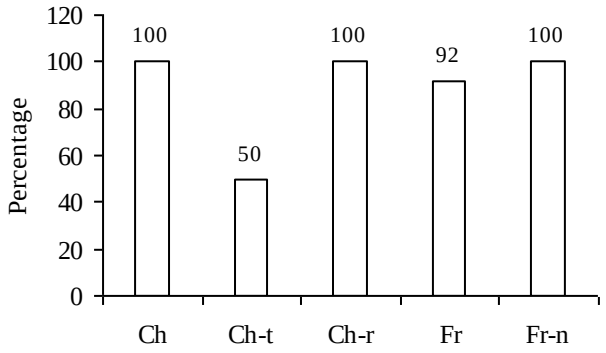


Figure 13: Comparison of E-R and M-R for ‘chaining’ sub-parameters



Ch: Chaining status CH-t: Chain type Ch-r: Chaining region
Fr: Opportunity for free-ranging
Fr-n: Free-ranging opportunity at night

Figure 14: Percentage wise deviation from E-R for 'chaining' sub-parameters

Observed behaviour

The temperament of captive elephants is an important feature vis-à-vis the husbandry practices adopted; it is also an interlinked feature of the management practice adopted. The occurrence of stereotypy among the elephants can be considered to be indicative of poor welfare conditions (Gruber, et al., 2000).

- 67% of the elephants (N= 39) were described as quiet/ reliable
- Of the three female elephants, a 35y old elephant was reported to be aggressive towards mahouts/ strangers and other animals
- 27% of the elephants (N= 33) were reported to exhibit stereotypic behaviours such as head/ body swaying of medium to low intensity

M-R was 5.5 (SE= 0.4, N*= 3) indicating a deviation of 31% from E-R. Figures 15 and 16 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

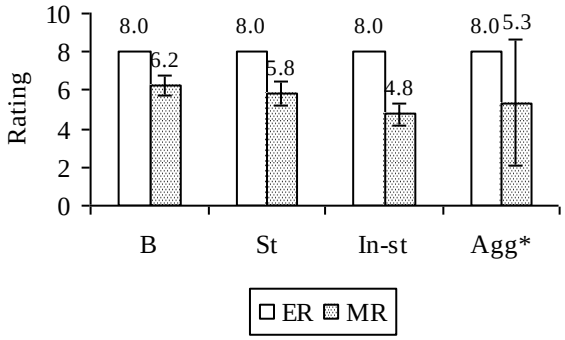
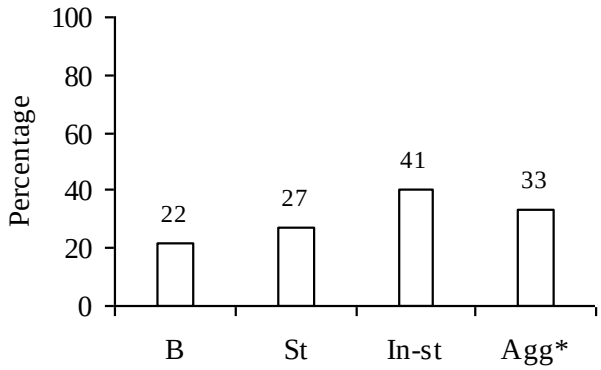


Figure 15: Comparison of E-R and M-R for 'behaviour' sub-parameters



B: Observed behaviour St: Occurrence of stereotypy In-st: Intensity of stereotypy
Agg: Occurrence of aggression
*: Expression of aggression during non-musth; recorded for female elephants only

Figure 16: Percentage wise deviation from E-R for 'behaviour' sub-parameters

Work

Captive elephants are used for work that is dictated by human goals; this maybe alien to the elephants' natural behavioural repertoire. Existing weather conditions at the workplace and provision of suitable remedies, such as shade/ water, are equally important for maintaining the elephant's well-being.

- 2% of the elephants (N= 41) were used for timber related work, 51% were used for festival work only, remaining were used for both; Festival work type involved parades/ temple rituals/ processions. Table-1 gives mean values of work conditions for the elephants
- Mean number of working days was 60 (ranging from 12- 315); working season was throughout the year from January-April/ February - March/ August - November/ August - April or May or October/ December - April or May
- Festival timings
    - 9a.m. – 12 noon
    - 2p.m. – 4p.m. / 2p.m. – 6p.m.
    - 3p.m. – 6p.m./ 4p.m. – 6p.m./ 4p.m. – 7p.m./ 4p.m. – 9p.m./ 5p.m. – 9p.m
    - 9p.m. – 6a.m./ 12a.m. – 5a.m.
- Tourism work timings
    - 7a.m. - 10a.m./ 11a.m.
    - 3p.m. - 5p.m.
- Timber work timings
    - 8a.m. – 10a.m./ 12 noon
    - 10:30a.m. – 1p.m.
    - 2p.m. – 4p.m/ 5p.m.
- Mean distance to work place was 100kms (ranging from 0 – 500kms)
- Mean distance to work place covered by foot was 39kms (ranging from 15-125km)
- Mean distance to work place covered by vehicle was 228kms (ranging from 45-1000kms)

- Remuneration per festival ranged from Rs.2000-3500/-
- 70% of the elephants did not have access to shade while working (N= 36); 21% (N= 39) did not have access to water; 5% (N= 39) were not given rest and all were given food while working, but duration for feeding was restricted and did not provide enough time for consumption of food by the elephants

M-R was 3.5 (SE= 1.2, N*= 8) showing a deviation of 56% from E-R. Figure 17 and 18 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

Table 1: Work condition for elephants

	Standing duration/day (hrs)	**Standing duration/night (hrs)**	**Maximum weight carried (kg)**	**Maximum Distance covered with weight (km)**	**No. of festivals attended which pay > Rs. 5000/ day**
Mean	4.0	3.5	168.9	1.9	7.0
SE	0.2	0.2	4.6	0.2	1.1

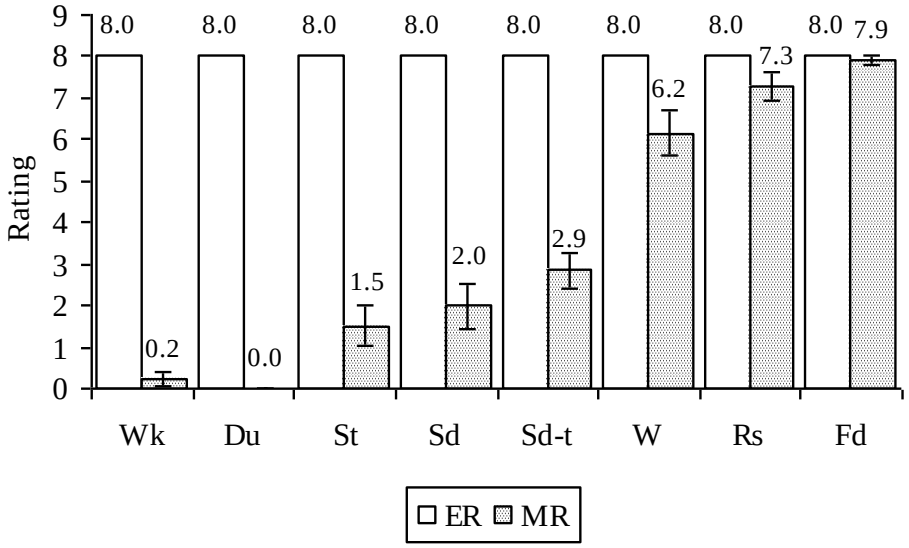
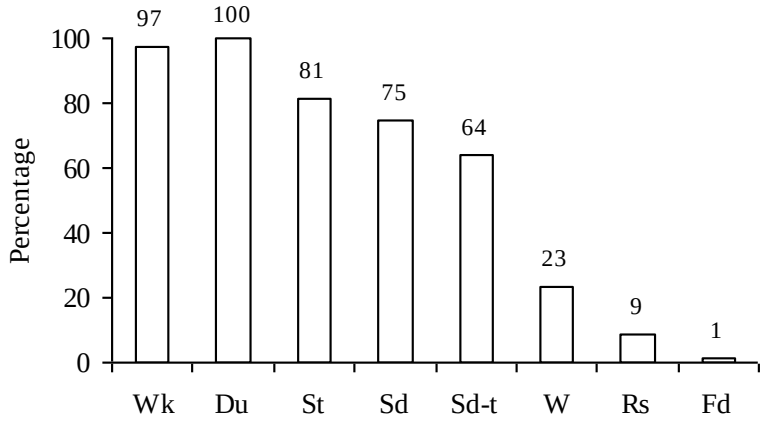


Figure 17: Comparison of E-R and M-R for ‘work’ sub-parameters



Wk: Work type Du: Duration of work St: Duration of standing while working
Sd: Shade availability Sd: Shade availability Sd-t: Shade type W: Water availability
Rs: Rest availability Fd: Food avialabitlity

Figure 18: Percentage wise deviation from E-R for 'work' sub-parameters

Food

In the absence of free-ranging opportunity, food available to elephants is limited to what is given by people. In contrast, wild elephants feed on a wide variety of plants, manipulating vegetation to enable feeding (Kurt and Garai, 2007).

- Only 7% of the elephants (N=42) were given both stall feed and allowed to free range to forage
- Feeding duration ranged from 2-3hrs to 10hrs, depending on work type; off-season duration ranged from 7-10hrs.
- Site of feeding was the shelter / work place; 68% of the feeding sites (at enclosure/ shelter) were described as poor-average
- Food provided was: *Caryota* leaves, other palm leaves, sugarcane (*Sacharum* sp.), rice (*Oryza sativa* grains), Bananas (*Musa* sp.), Jaggery (sweet derived from sugarcane), *Erythrina* sp. leaves, grasses, ragi (*Eleusine coracana*)
- Food provided during musth period was *Curd* rice (cooked rice grains with yoghurt), water-melon (*Citrullus lanatus*), cucumber (*Cucumis sativus*), Banana stems, *sago* (starch from *Metroxylon sagu*), Rice flakes with banan
- Rice with turmeric (cooked rice grains with turmeric— *Curcuma longa* powder)/ rice flakes with curry leaves (*Muraya koenigii*) was given for timber work; ayurvedic powders, dates (*Phoenix dactylifera)*, banana, rice flakes, meat, eggs, *ghee* (clarified butter), *Gingelly* (Sesame) oil, jaggery were given for rejuvenation
- 91% of the elephants were not given straw as food
- Mineral mix was not given for any of the observed elephants
- Except one place, ration charts were not used

M-R was 1.4 (SE= 0.9, N*= 6) showing a deviation of 83% from E-R. Figures 19 and 20 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

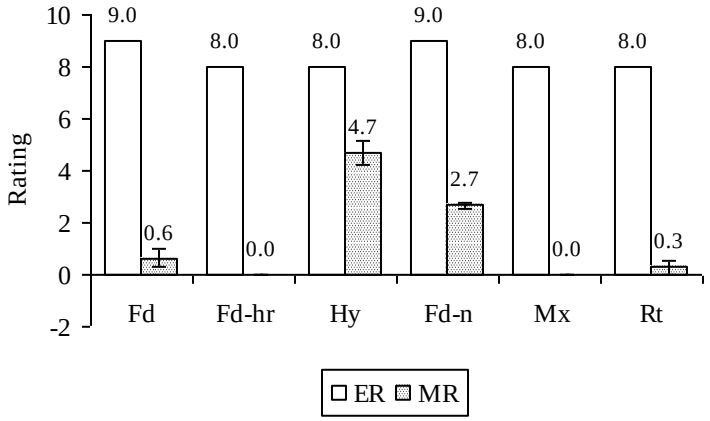
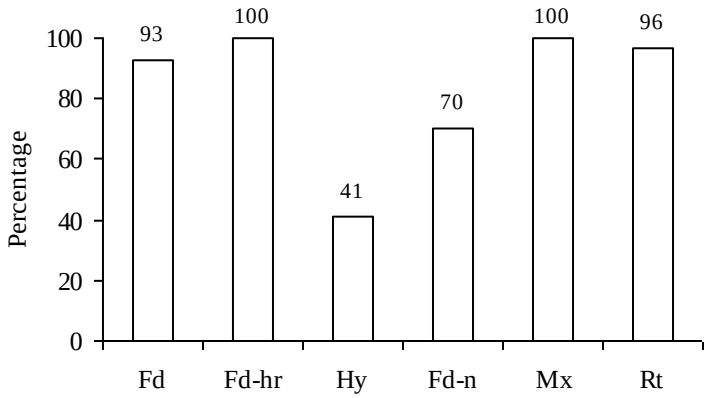


Figure 19: Comparison of E-R and M-R for 'food' sub-parameters



Fd: Food provisioning type Fd-fr: Feeding hours (duration) Hy: Hygiene of feeding place
Fd-n: Number of food items Mx: Mineral mix Rt: Ration chart usage

Figure 20: Percentage wise deviation from E-R for 'food' sub-parameters

Reproductive status

Male elephants cover greater distances while in musth (Fernando, et al., 2008), in search of mates. The presence of more number of male elephants and the incidence of musth pose a problem in managing the elephants without reducing their welfare.

- The occurrence of oestrus cycles among the three female elephants was not known
- Physical contact with male elephants was not allowed
- 14% of adult male elephants were not exhibiting musth signs (N=21)
- Time of musth ranged from January to December with elephants coming to musth in different months
- Chaining and watering of musth elephants was practiced
- 60% of the elephants had exhibited signs of aggression towards people/ other animals while in musth (N= 25)

- 21% of the elephants (N= 24) were not exposed to females
- 53% of the elephants had not sired offspring (N= 19), status was not known for the rest

M-R was 3.5 (SE= 1.5, N*= 5) showing a deviation of 57% from E-R. Figures 21 and 22 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

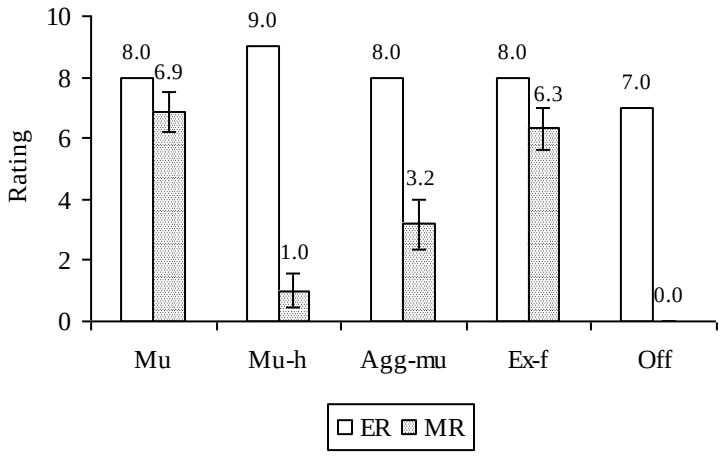
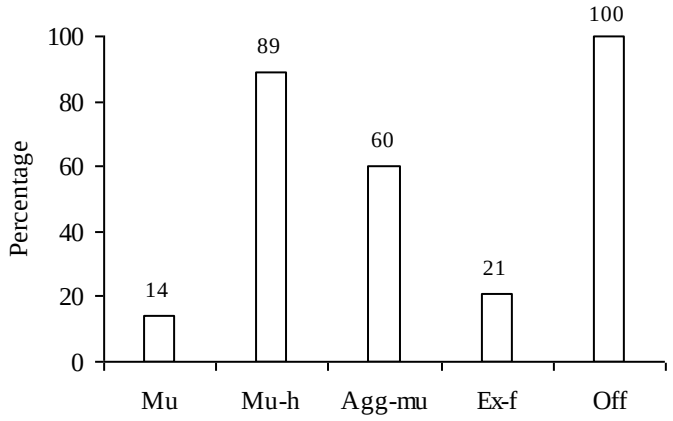


Figure 21: Comparison of E-R and M-R for 'male reproductive status' sub-parameters



Mu: Occurrence of musth Mu-h: Handling of musth Agg-mu: Aggression during musth
Ex-f: Exposure to females Off: Offspring sired

Figure 22: Percentage wise deviation from E-R for 'male reproductive status' sub-parameters

Health status

Poor living conditions such as unsuitable substrates/ unhygienic conditions/ physical exertion /psychological stress may lead to ill-health. Maintenance of a prescribed veterinary schedule is essential for the health of the elephants.

- Four elephants, aged 40-43y, were reported to be blind in one eye. Among these, a 40y old elephant was blind in both eyes

- Ten elephants had foot related injuries: leg wounds/ toe nail cracks
- Kidney problems/ impaction/ tusk infection, parasitic infestation were the other health issues recorded
- One elephants had a broken tail bone after being hit by a vehicle
- Deworming was done for 47% of the elephants (N= 32); the practice was regular for all except one elephant
- Immunization was not done for any of the elephants (N= 33)
- Application of oil on the body was not done for any of the elephants (N= 32)
- Samples of blood/ urine/ dung was not tested for any of the elephants (N= 34)
- Body measurements were taken for only 33% of the elephants (N= 33)

M-R was 2.6 (SE= 1.1, N*= 7) indicating a deviation of 68% from E-R. Figures 23 and 24 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

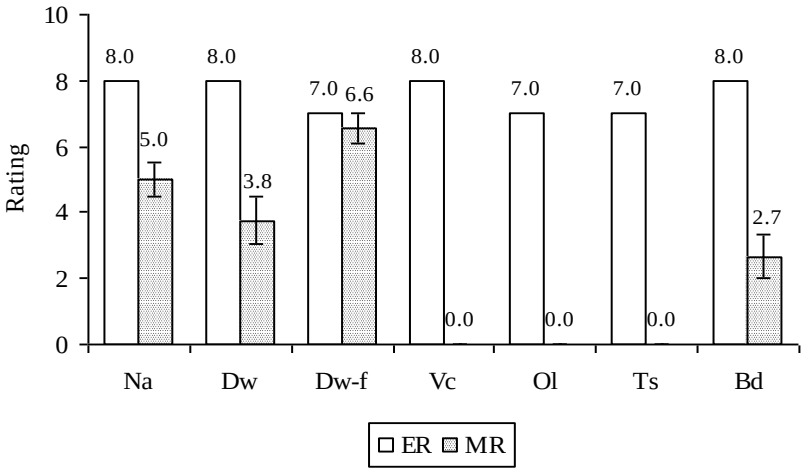
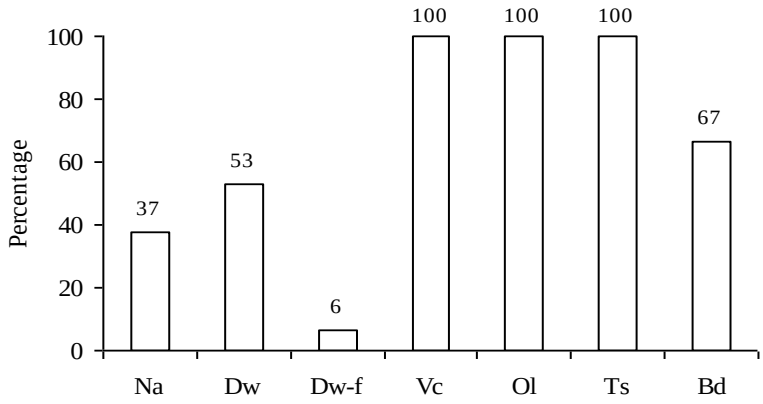


Figure 23: Comparison of E-R and M-R for 'health status' sub-parameters



Na: Nature of disease/ injury Dw: Deworming status Dw-f: Frequency of deworming
Vc: Vaccination status Ol: Oiling status Ts: tests of blood/urine/dung samples
Bd: Body measurements

Figure 24: Percentage wise deviation from E-R for 'health status' sub-parameters

Veterinary personnel and infrastructure

Access to veterinary care and other infrastructure such as accommodation for handlers/ rooms for cooking/ storage/ veterinary dispensary unit, etc., in a captive situation will ensure effective administration.

- All elephants had access to a veterinary doctor, years of experience ranged from 5- 35y.
- Frequency of visits: on call
- Distance from elephant location to doctor's place ranged from 10- 200kms
- Veterinary assistant was not available for 14% of the elephants (N= 28)
- Number of facilities available ranged from one – five; veterinary clinic facility was available for 70% of the elephants (N= 29)
- 70% handlers had access to accommodation (N= 36)
- Service/ clinical/ health records were not maintained for 14% of the elephants (N= 37)

M-R was 5.9 (SE= 0.9, N*= 7) showing a deviation of 26% from E-R. Figures 25 and 26 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

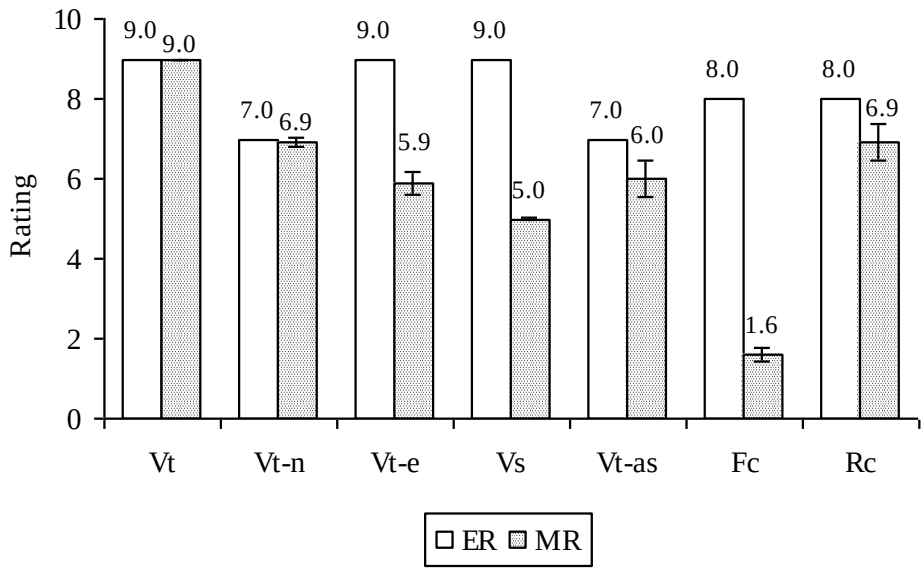
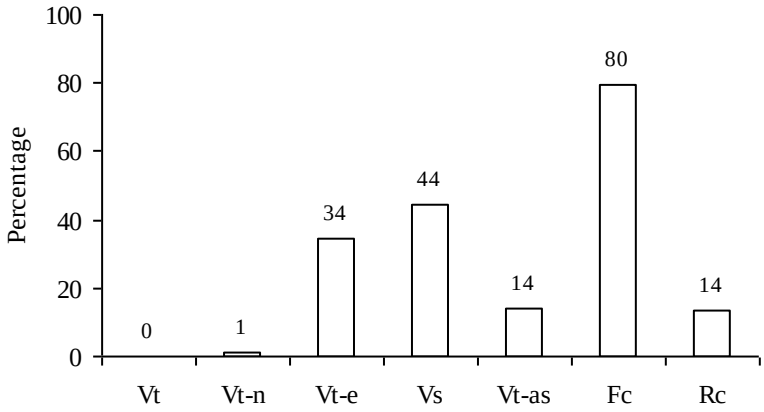


Figure 25: Comparison of E-R and M-R for 'veterinary personnel and infrastructure' sub-parameters



Vt: Availability of veterinary doctor Vt-n: Number of years of experience
Vt-e: Experience with elephants Vs: Frequency of visits Vt-as: Availability of veterinary assistant
Fc: Number of facilities available Rc: Maintenance of records

Figure 26: Percentage wise deviation from E-R for 'veterinary personnel and infrastructure' sub-parameters

Mahout/ cawadi professional experience and socio-economic status

Information was collected on 36 handlers, employed by private owners. Mean age was 38.2y (SE= 2.8, N= 23) ranging from 19- 61y. Handlers (mahouts/ cawadis) are integral to a captive elephant situation where unrestricted contact is maintained between man and animal. Thus, their professional knowledge and attitude is vital to maintaining safety of the animal/ people. Poor social security/ knowledge/motivation or economic mismanagement may lead to conflict in the way elephants are handled.

Professional experience

- Mean experience in this profession was 18.5y (SE= 2.2, N= 23) ranging from 1-35y
- Mean experience with a specific elephant was 4.1y (SE= 1.4, N= 22) ranging from 7 days to 24y; Figure 27 shows comparison between number of years of experience in this profession and experience with a specific elephant, correlation coefficient between these two variables was 0.4
- 90% handlers opted for this profession out of interest

M-R was 6.0 (SE= 1.5, N*= 3) implying a deviation of 26% from E-R. Figure 28 and 29 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

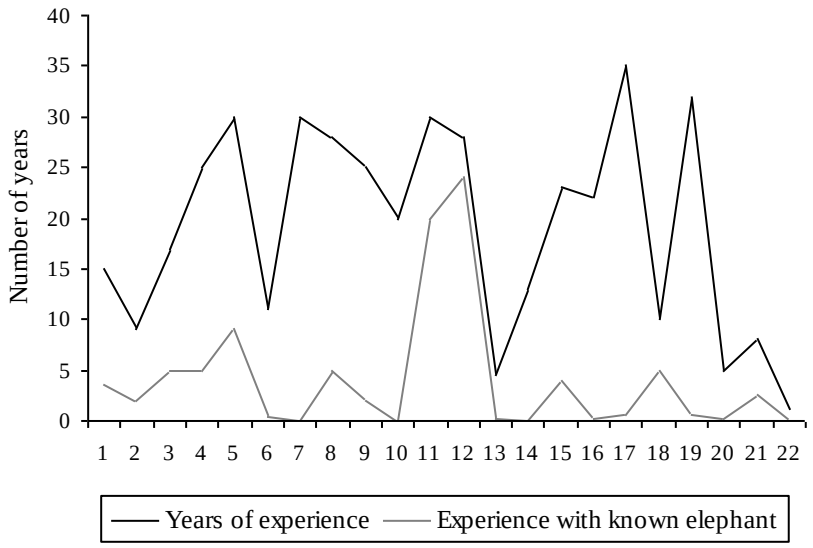


Figure 27: Comparison between professional experience (number of years) and years with specific elephant

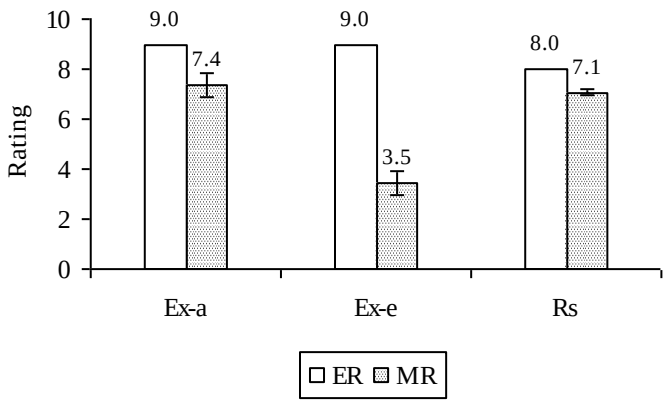
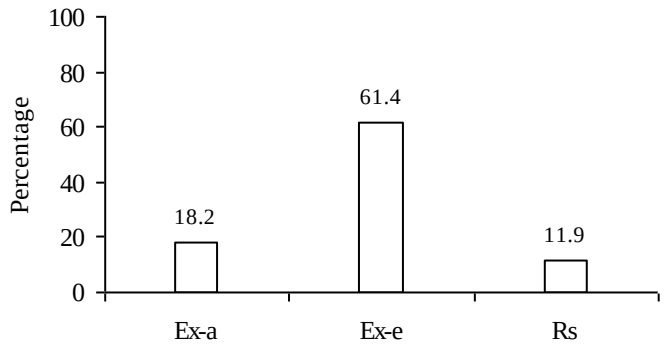


Figure 28: Comparison of E-R and M-R for handlers' professional experience



Ex-a: Experience (% of handlers' age) Ex-e: Experience (% of elephant's age) Rs: Reason for choosing this profession

Figure 29: Percentage wise deviation from E-R for handlers' professional experience

Socio-economic status

- 67% of handlers had relatives working in the same profession (N= 18)
- 67% of handlers' family occupation was not related to handling elephants— *coolie* (laborer)/ agriculture was the family occupation
- All handlers were literate (N= 20), with maximum schooling being 9th standard and minimum being 4th
- Mean annual salary was Rs. 43,000/- ranging from Rs. 14,000 to 80,000/-
- Number of children per family ranged from 1-3
- Maximum of three languages was known by the handlers
- Mean number of hours spent with elephant (off-season) was 7h (ranging from 4-19h); while working, mean number of hours spent was 16.4h (ranging from 9-21h)
- All handlers used tools to control their elephant: Wooden ankush with metal spike and pinhead, stick, stick with an iron nut around at one end
- Only 25% of handlers were covered by insurance (N= 20)
- Mean number of elephants each handler had worked with was 7.0 (ranging from 2- 35); modal value was 3.0
- 50% handlers consumed alcohol (N= 18), after work / on alternate days / weekly / occasionally

M-R was 3.7 (SE= 0.6, N*= 9) indicating a deviation of 47% from E-R. Figures 30 and 31 give the rating and Percentage wise deviation respectively, for each of the sub-parameters.

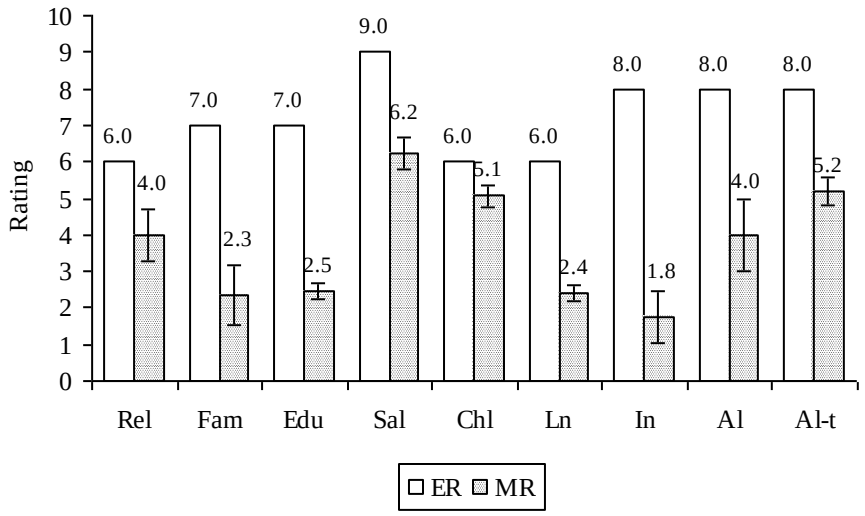
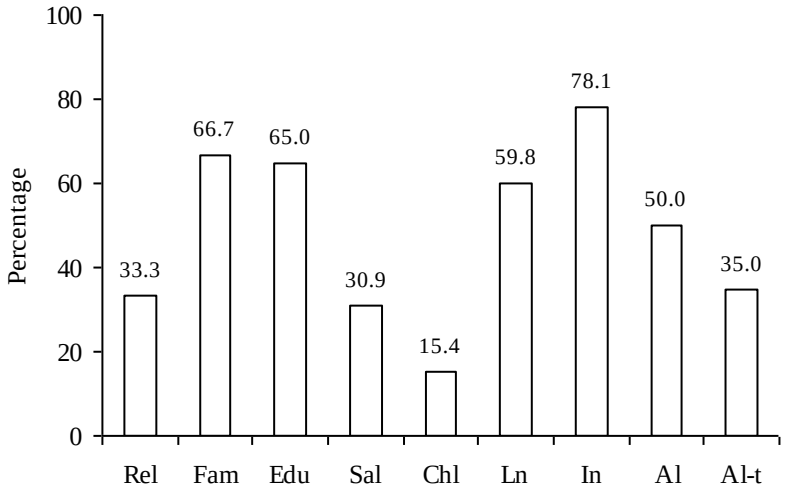


Figure 30: Comparison of E-R and M-R for 'handlers' socio-economic' status



Rel: Relative in this profession Fam: Family occupation Edu: Education level
Sal: Salary Chl: Number of children Ln: Languages known In: Insurance availability
Al: Alcohol consumption Al-t: Timings of consumption

Figure 31: Percentage wise deviation from E-R for handlers' socio-economic status

Overall welfare status of elephants

Figure-32 shows 41 of the observed 66 parameters (62%) expressed deviation of 50% or more from E-R. These parameters were spread across all the observed features: physical/ social/ physiological and veterinary aspects implying poor overall condition.

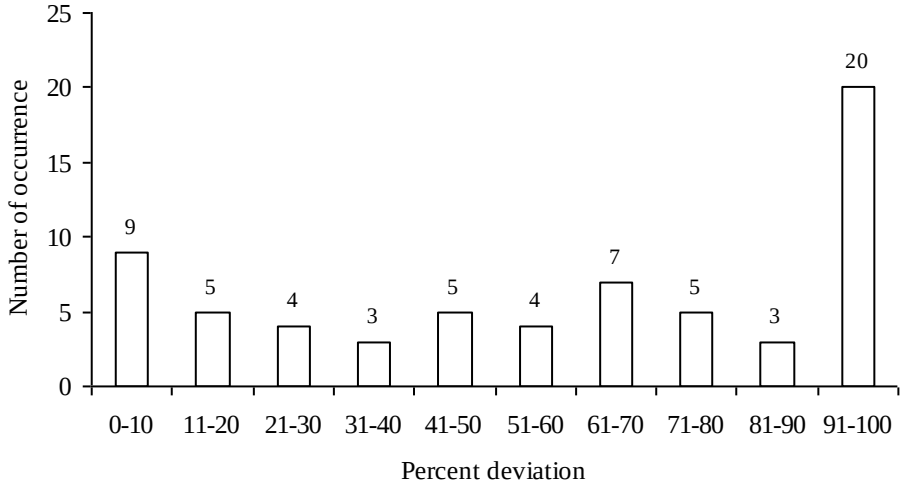


Figure 32: Distribution of Percentage wise deviation from E-R for observed parameters

Discussion

A characteristic feature of elephants with private owners was the predominance of males. Specific management practice, however, was limited to musth handling of males; all other husbandry methods being similar for males and the few females.

The need for space to forage/ engage in species-specific activity, use of naturally available resources such as mud/ water/ vegetation as ways of minimizing heat loss, expression of species-typical behaviors in appropriate context (reproductive/ social) are well documented (Poole and Granli, 2009; Sukumar, 2006).

Human dominance in all aspects of elephant life was observed for the elephants with private owners. Following aspects were evident:

- Confined space with little/ no opportunity to move or free range in natural conditions
- All encompassing nature of work schedule which decided husbandry methods for the elephants: opportunity to walk/ socialize/ rest/ drink water/ bathe were all decided by the work schedule
    - Shelter/ sleeping place was decided by the location of work; Work schedule implied continuous exposure to other elephants with two consequences:
        a. Breakage of established bonds with elephants belonging to the same owner
        b. Introduction of new elephants with potential for conflict among elephants without any recourse to express species-typical behaviour of fight/ flight
        c. Presence of unknown musth elephants
    - Elephants were worked throughout the day either for timber or festivals or a combination of both. Saseendran et al., (2009) report on the effects of using elephants for timber hauling, noting change in body temperature, pulse and respiration rate which increased with increasing duration and amount of work. Use of unsuitable dragging materials such as nylon ropes to haul logs is said to damage the jaw or mouth parts (early wear and tear of teeth) of the elephant (Ponnappan, 1998).
    - Traveling to different locations as part of work involved covering long distances either by walk or vehicles. One elephant had even been hit by a vehicle, damaging its tail bone
    - Imposition of unnatural behaviour while working such as standing still for long hours, in close proximity to unknown elephants or female elephants standing close to males, surrounded by loud noise of the crowd/ festivities, high temperature
- Absence of opportunity to forage in natural conditions as most (93%) were stall fed. Elephants are known to spend a major part of their activity in foraging (Poole and Granli, 2009)
- Male elephants are known to wander in search of mates (Fernando, 2009), musth state considered to be associated with expression of dominance (Venkataraman, unpublish.) as males compete to mate with females.
    - Male elephants in musth, with private owners, were all chained and isolated. The predominance of male elephants with private owners does not mean their presence in captivity without necessary social interaction with other elephants is

acceptable. The development of an individual in the presence of herd members is considered crucial to its learning the strengths and weaknesses of others of the same sex (Poole and Granli, 2009). In addition, absence of members of the opposite sex during musth and concomitant chaining for the musth duration are totally contradictory to what the elephants need/ express.

  - Incidents of aggression during musth period was reported for most elephants
- The occurrence of vision loss among elephants of prime age was observed (all aged between 40-43y); immunization was not practiced; application of oil was not done; testing of dung/ urine/ blood samples was not done

Handlers' status:

- Irrespective of the number of years in this profession, experience with a specific elephant was low implying change of mahouts/ cawadis. Most handlers had worked with at least three elephants.
- Handlers did not report this as their family occupation. Despite the history of elephant keeping in Kerala, the presence of a new generation of handlers whose family occupation was not this profession implies recruitment of inexperienced people or absence of people with knowledge on elephants
- Insurance cover was not provided for most handlers
- No health check-ups were done for the mahouts/ cawadies

Reference

1. Cheeran, J.V. (2009) Elephant facts, In: Health care and management of captive Asian elephants (Ajithumar, G., Anil, K.S., Alex, P.C. and Rajeev, T.S., eds.), Kerala Agricultural University Elephant Study Centre Faculty of Veterinary and Animal Sciences Mannuthy, Thrissur, Kerala
2. Fernando, P., Wikramanayake, E. D., Janaka, H. K., Jayasinghe, L. K. A., Gunawardena, M,, Kotagama, S. W., Weerakoon, D. and Pastorini, J. (2008) Ranging behavior of the Asian elephant in Sri Lanka, Posted at the Zurich Open Repository and Archive, University of Zurich. http://www.zora.uzh.ch; Originally published at: Mammalian Biology - Zeitschrift fur Saugetierkunde 2008, 73(1):2-13
3. Gruber, T.M., Friend, T.H., Gardner, J.M., Packard, J.M., Beaver, B. and Bushong, D. (2000). Variation in stereotypic behaviour related to restraint in circus elephants. Zoo Biology 19: 209-221
4. Kurt, F. and Garai, M.E. (2007). The Asian elephant in captivity—a field study. Foundation books, Cambridge University press, New Delhi
5. Lair, R.C. (1997). Gone Astray - The Care and Management of the Asian Elephant in Domesticity. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand
6. McKay, G.M. (1973). Behavior and Ecology of the Asiatic Elephant in Southeastern Ceylon. Smithsonian Institution Press, City of Washington
7. Ponnappan, A.K. (1998) Timber elephants of Kerala, In: Practical elephant management— A handbook for mahouts. (Namboodiri, N. Ed.). p:47- 49.
8. Poole, J. and Granli, P. (2009). Mind and Movement: Meeting the Interests of Elephants. In: An elephant in the room: the science and well being of elephants in captivity,

(Forthman, D.L., Kane, F. L., Hancocks, D., and Waldau, P.F. eds.) Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Tufts University

9. Saseendran, P.C., Anil, K.S., Anilkumar Nair and Prasad, A. (2009). Elephants and work In: Healthcare Management Of Captive Asian Elephants (G. Ajitkumar, G., Anil, K. S., Alex, P. C. and Rajeev, T.S., Eds.) Kerala Agricultural University Elephant Study Centre, Faculty of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala, India
10. Sukumar, R. (2006). A brief review of the status, distribution and biology of wild Asian elephants *Elephas maximas*. International Zoo Yearbook 40: 1-8
11. Varma, S. (2008). Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (Varma, S. and Prasad, D., Eds.), A joint publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
12. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity—insights and recommendations, In: 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. (Varma, S. and Prasad, D., Eds.), A joint publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
13. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (Varma, S. and Prasad, D., Eds.), A joint publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

Section 7:
Captive Elephants under Private Ownership in Rajasthan

Executive summary

Elephants seem to have been maintained in Rajasthan, more specifically in Jaipur, during the period of Kings/Queens for war/other reasons. Keeping elephants in unsuitable areas and enforcing a human controlled way of life that deviates from the normal lives of free-roaming elephants affects the psychological health of these animals (Bradshaw, 2007). Health issues such as chronic foot problems, abnormal weight and susceptibitlity to diseases (Mikota, et al., 1994) have been reported.

Welfare status of the captive elephants has been assessed by comparing physical/ physiological/ social and psychological features in captivity with those observed in the wild. Deviations from conditions in the wild have been considered to represent poor welfare. The greater the deviation, the poorer is the welfare. Deviation from the wild state for the parameters observed was rated using a scale developed by elephant experts. This survey of elephants was done in 2005; results are presented based on this survey. In 2009, a report by Dr. Cheeran, J.V., presented updated status of some of the parameters. This has been included where applicable. The list of elephants in Jaipur was updated in 2009.

This investigation includes observations on a total of 119 elephants (112 females, 7 males) in four locations— Amer, Jalmahal, Kunda, Mahout Mohalla (all located around Jaipur) and Jaipur. The age of female elephants ranged from 3 - 50y and male from 28 -50y. By 2009, five elephants had died, all adult females, aged between 30-50y and no new elephants were brought into Jaipur or its surrounding areas. All the elephants were reported to be maintained for activities such as hiring out to functions (marriages/ festivals) or for providing tourist rides and related activities. Mean Rating (M-R) for the observed elephants was 0.0 implying no natural conditions and use for commercial purposes only, showing a deviation of 100% from Expert Rating (E-R).

The animals were brought in from eight different states of the country (including Rajasthan). Of these, Uttar Pradesh contributed 32 elephants, followed by Delhi (18), Bihar (16), Assam (13), Rajasthan (6) and other states contributing less than five animals with one elephant being brought/ bought from a circus. Eighty percent of the elephants had spent 10y or less with 60% said to have spent 5 years or less in Jaipur. M-R for this parameter was 1.5 indicating a deviation of 75% from E-R.

All the elephants were provided with a shelter measuring 18 X 21ft., 6 X 7m, 21 X 7ft., the shelter had a common roof across this space. Combinations of sand and stone or just cement or only stone were the floors provided to the animals. Overall M-R was 2.6 implying a deviation of 68% from E-R. The shelter for elephants, in 2009, had improved as barns were constructed with high roofs to provide for ambient temperature within.

Borewell water was provided through taps, the bathing place was the *Pilkhana* (shelter/ feeding place) and the duration of bath was 2-3h, elephants were scrubbed using Pumice stone. M-R was 2.8 indicating a deviation of 66% from E-R. In 2009, water was available ad lib within the barns/ shelters and elephants were watered to cool them.

All the elephants were walked on tarred roads as part of their work routine, distance from *Pilkhana* to work was around 4km and all the animals were walked by their mahouts/ cawadis. M-R for walking (based on nature of terrain and time of day) was 2.0 indicating a deviation of 75% from E-R. All the observed elephants were allowed opportunity for interaction; however, only owners with more than one elephant enabled any sort of interaction for their animals. M-R for interaction opportunity was 7.9 showing a deviation of 1.1% from E-R.Elephants were chained when in the *Pilkhana*; *w*hile walking/and working, elephants are not chained, and none of the elephants were allowed to free range. M-R was 0.3 implying a deviation of 96% from E-R.

All the elephants were used for tourism related work; providing rides, attracting tourists; they were also hired out to festivals/ functions, the animals were made to seek money from the public. Tourist rides involved carrying two persons for a distance of 100m using a *howdah* (saddle) weighing 100kgs; *howdah* was made of iron pipes enclosing bedding material. Place of work and shelter were not the same and the work was said to be situated 3 to 6km from the *Pilkhana.* Elephants were worked all days of the week with the main season said to be March-May. M-R was 1.3 showing a deviation of 83% from E-R. In 2009, the work was restricted by reducing the number of trips and not carrying tourists on the way down in Amer fort; shade was available in between periods of work

All the elephants were given only stall feed, the food given included Jowar/ Sorghum straw, Jaggery (sweet derived from sugarcane), Chapatti (a kind of roasted bread made of wheat) and sugarcane. M-R was 1.9 with a deviation of 79% from E-R. The food provided had improved in 2009, as mixture of browse and grass was given, greens provided a source of Vitamin A to the elephants

Among the adult females, only three elephants had given birth; these elephants were already pregnant when they were brought into Jaipur, two from Uttar Pradesh and one from Arunachal Pradesh; of the calves born two were alive. Among the adult males, only one was said to exhibit musth symptoms annually. M-R was 4.6 with a deviation of 42% from E-R being observed.

Ninety percent of elephants had one or more of the following problems associated: with foot pad / eyes; were observed to have abscesses/ wounds from the howdah. All the elephants had been dewormed (three times/ year), immunized against Tetanus, oil applied on head and body weekly or seasonally, biochemical tests of blood done annually. M-R was 6.2 implying deviation of 12% from E-R. In 2009, five adult female elephants had died, cause was not known.

A veterinary doctor was available for all the elephants with 6yrs experience in treating elephants. The frequency of the doctor's visit was daily and service/ Health/ Medical Records were maintained. M-R was 5.4 indicating a deviation of 32% from E-R. The overall M-R was 3.7 which show a deviation of 53% from E-R. Thus, irrespective of the parameter, there was a difference of 50% from the norm for the observed elephants for more than half of the observed features.

Introduction

Captive elephants by virtue of their association with people are maintained in regions where their wild counterparts have never been recorded. Elephants seem to have been maintained in Jaipur during the period of Kings/ Queens, for war/ other reasons. In India, arid/ semi-arid regions for example, Jaipur, experience extreme temperature variation (ranging from 40-10°C) across seasons. This ambient temperature could prove harmful to elephants' physical condition in view of their biology, thermoregulatory mechanisms and restrictions forced by captive work situations/ living environment. The twin practice of maintaining elephants in unsuitable areas and imposing a human controlled way of life can have negative consequences on the elephants' physical and psychological well-being.

Objective

Welfare status of elephants may be affected when kept in conditions alien to their normal environment. This investigation aims to:

- Assess the welfare of captive elephants in and around Jaipur city through a series of physical, social, health and management features

Method

Maintaining elephants in conditions alien to their natural living environment with little or no opportunity to perform species-typical activities may result in expression of abnormal behaviours such as stereotypy/ homicide (Bradshaw, 2007).

Data was collected through observation of elephants/ interview of relevant personnel in the institution. Welfare status of the elephants has been assessed by comparing physical/ physiological/ social and psychological features in captivity with those observed in the wild. Deviations from wild conditions have been considered to represent poor welfare. The greater the deviation, the poorer the welfare. Deviation from conditions in the wild for the parameters observed was rated using a scale developed by elephant experts.

The rating method

A rating scale from zero (unsuitable conditions) to ten (suitable conditions) was used to assess the welfare status of captive elephants and their handlers. Experts (both wild and captive elephant specialists, wildlife veterinary experts, managers from protected areas administering both wild and captive elephants and other wildlife, personnel from welfare organisations and elephant handlers) were invited to assess the welfare based on welfare parameters and their significance, through an exclusive workshop conducted on the subject (Varma, 2008; Varma, et al., 2008; Varma and Prasad, 2008). Experts rated a total of 114 welfare parameters covering major aspects of captivity.

- The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter. For example mean expert rating of 8.0 (SE= 0.5, N=29) for a parameter 'floor' and 9.0 (SE=0.4, N=31) for 'source of water' was arrived at from the ratings suggested by each expert and by averaging across all the experts' values.
- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e.,

for a parameter with 8.0 as the maximum value, only 2.0 (25%) deviation and parameter with maximum value 9.0, only 1.0 or 10% from the prescribed norm is considered acceptable.

- The rating for existing captive conditions is then graded from most suitable to unsuitable. For example, if an elephant is exposed only to natural flooring, the animal receives a rating of 8 and for entirely unnatural flooring the value is 0; if animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 2.25 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 1.125 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5625. This rating is then averaged across all individuals in that institution to get a Mean Rating (M-R) for that feature. Thus M-R represents the actual situation existing for the elephant/s.
- Therefore, using the maxima given by experts as a base, a rating scale starting from zero to the particular maximum value for that parameter has been used and the data for each animal was collected, in a given regime (for example, forest camp or temple).
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. The variables have been termed sub-parameters. For example, the variables shelter type, shelter size, floor type in the shelter— all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. The Mean Rating (M-R) for a parameter is the mean of M-Rs across related sub-parameters and denotes welfare status of existing conditions on the ground for the particular parameter.
- The number of such related parameters (sub-parameters) varies for each regime.
- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percentage) indicates deviations from the prescribed norm.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate their professional/ socio-economic status, of value to the handler and his elephant.
- N* refers to number of sub-parameters observed. N refers to number of individuals.

Result

This report includes observations on a total of 119 elephants (112 females, 7 males) in four locations— Amer, Jalmahal, Kunda, Mahout Mohalla (all located around Jaipur) and Jaipur. The data collected has been pooled together to constitute elephants of Jaipur. Respective ages and numbers, segregated by sex, are provided in Figure 1. Females ages ranged from 3 - 50yrs and the males ages from 28 -50yrs.

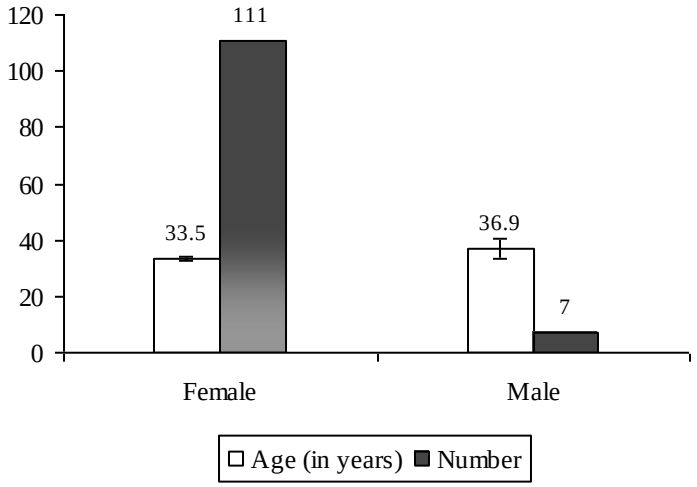


Figure 1: Age-sex distribution of elephants in Jaipur

The total number of elephants observed in 2005 was 119; by 2009, five adult female elephants had died. Figure 2 and 3 give comparative occurrence of age groups across both years. In 2005, males and females in the age group of 16-40y accounted for 71.4 and 91% of all elephants whereas in 2009, this was 75 and 57% respectively. There were no additions among calves, despite the predominant occurrence of females of breeding age.

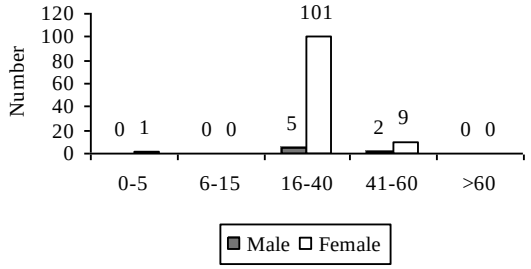


Figure 2: Age class distribution in the year 2005

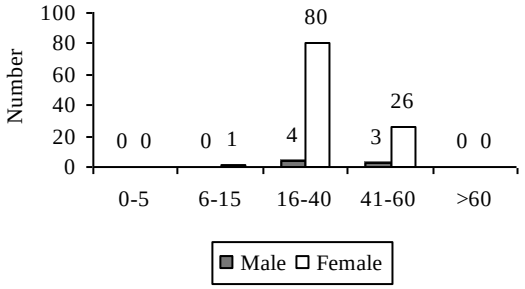


Figure 3: Age class distribution in the year 2009

Purpose of keeping

When commercial interest is the sole reason for keeping elephants, use/ overuse of the animals is a likely outcome as income generation may outweigh all other considerations. Along with this, needs of the animals may not be given priority, if at all. High rating has been assigned to those elephants which are kept in semi-natural/ natural conditions with no commercial interest.

All the elephants were reported to be maintained for activities such as hiring out to functions (marriages/ festivals) or for providing tourist rides and related activities. M-R for the observed elephants was 0.0 (SE= 0.0, N= 119) implying no natural conditions and use for commercial purpose only, showing a deviation of 100% from E-R.

Source of elephants

Whether the elephants are captive born/ have been shifted across owners or locations, is important to the animals' welfare as they may undergo different management systems, maybe exposed to new elephants, new handlers, etc., all factors capable of causing stress and poor welfare. Figure 2 gives a comparison of elephants' years of residence in Jaipur and handlers' experience per elephant.

- The elephants were either purchased or were moved from another region to their present location.
- The animals were brought in from eight different states of the country (including Rajasthan). Of these, Uttar Pradesh contributed 32 elephants, followed by Delhi (18), Bihar (16), Assam (13), Rajasthan (6) and other states contributing less than five animals with one elephant being brought/ bought from a circus.
- Mean duration of stay in Jaipur for the elephants was 5.6y (SE= 0.6, N=91)
- Eighty-seven percent of the elephants had spent 10 yrs or less with 58% said to have spent 5 yrs or less in Jaipur (Figure 2). This would imply introduction of new elephants into the city, not those maintained originally by Royalty and then handed over to mahouts/cawadis.
- From Figure 4, it can be seen that the percentage of occurrence of both variables─ time spent by elephants in Jaipur and time spent by handler with an elephant─ follow a similar pattern. However, maximum percentage of occurrence of duration spent with an elephant by a handler exceeds that of the period of stay by elephants in Jaipur implying a disjunction between stay in Jaipur (by an elephant) and time spent with an elephant. This maximum value was nearly 63% indicating duration of only 1-5y for a handler with an elephant. Similar duration of stay (1-5y) by an elephant in Jaipur was 37% implying shorter duration with an elephant irrespective of its stay in Jaipur.

M-R for this parameter was 1.5 indicating a deviation of 75% from E-R

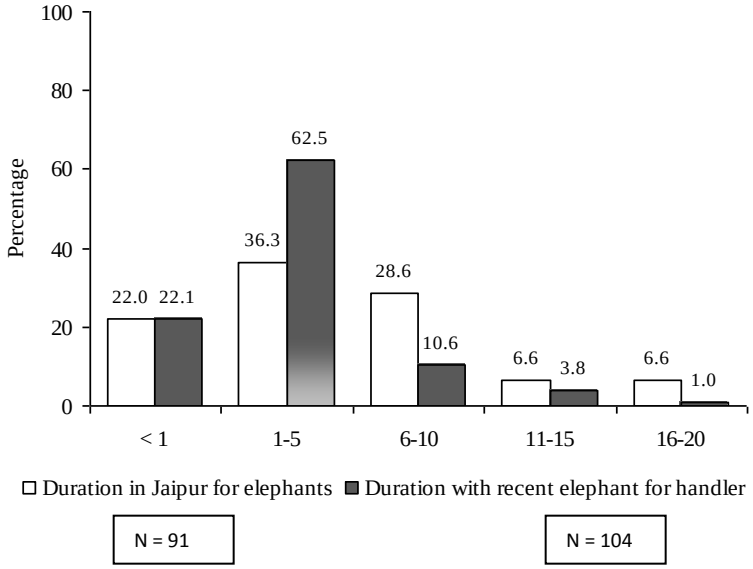


Figure 4: Comparison of duration of stay for elephants in Jaipur and period spent by handlers with each animal

Shelter

Wild elephants are known to cover several hundred kilometers as part of their home range (Poole and Granli, 2009; Sukumar, 1989), in response to ecological and social needs. In striking contrast, captive elephants are forced to live their lives in confined spaces made of unsuitable materials.

- All the elephants were provided with a shelter (Figure 5a) measuring 18 X 21ft., 6 X 7m, 21 X 7ft., the shelter had a common roof across this space
- Flooring : a combination of sand and stone or just cement or only stone floors (Figures 5b and c)
- Shade (Figure 5d) was available for some, while there was no shade for others in the shelter
- Cleaned daily to remove dung/ food waste/ urine, cleaned with broom and phenyl, hygiene quality was poor
- The 2009 report mentions the construction of barns open on all sides with a roof high enough to provide for suitable ambient temperature within.

Overall M-R was 2.6 (SE= 1.8, N*= 5) implying a deviation of 68% from E-R (Figures 5a and b).

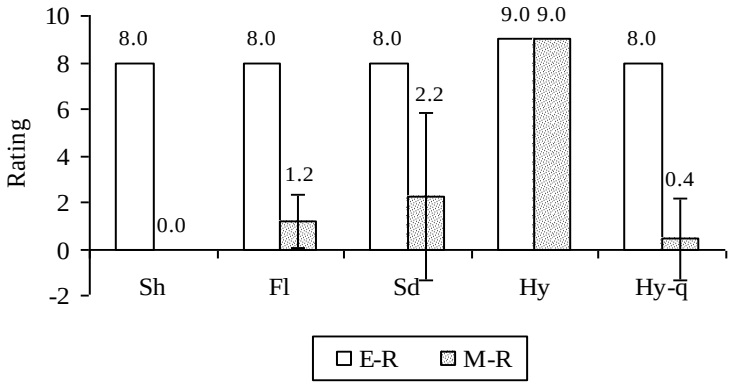
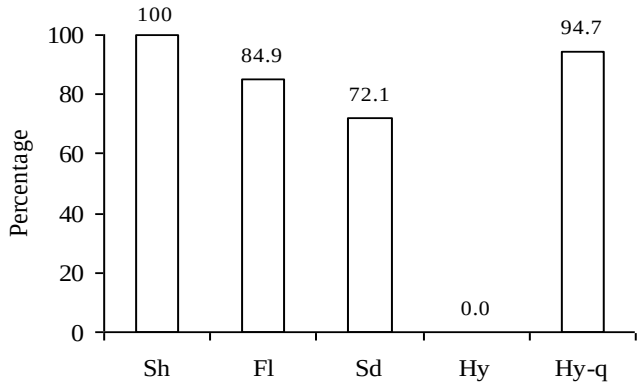


Figure 5a: Comparison of E-R and M-R for 'shelter' sub-parameters



Sh: Shelter type Fl: Flooring Sd: Shade availability Hy: Hygiene maintenance
Hy-q: Quality of hygiene maintenance

Figure 5b: Percentage wise deviation from E-R for 'shelter' sub-parameters

Water and related features

Subject to availability, elephants have been observed to drink water at least once a day (Sukumar, 1991); bathing appears to have thermoregulatory properties (Weissenbock, 2006), along with aiding in socialization among conspecifics. Rating has been designed to indicate provision for unlimited supply and access to free-flowing water, access to suitable bathing areas, duration. In captivity, bathing of elephants is done by mahouts/ cawadis. Hence, the use of suitable scrubbing material has also been considered.

- Borewell water was provided through taps
- For drinking, water troughs were available, the elephants were said to drink thrice a day
- 68% elephants were reported to have insufficient/ poor / non-existent provision for water
- Bathing place was the *Pilkhana* (shelter/ feeding place) and some seasons, water stored around the fort also used for washing and bathing elephants
- Duration of bath was 2-3hrs, elephants were scrubbed using Pumice stone
- In 2009, water was available ad-lib within the barns which was said to have reversed the dehydrated state of elephants seen in previous years; the elephants were cooled by pouring water onto them while in the shelter

M-R was 2.8 (SE= 1.3, N*= 6) indicating a deviation of 66% from E-R (Figures 6a and b).

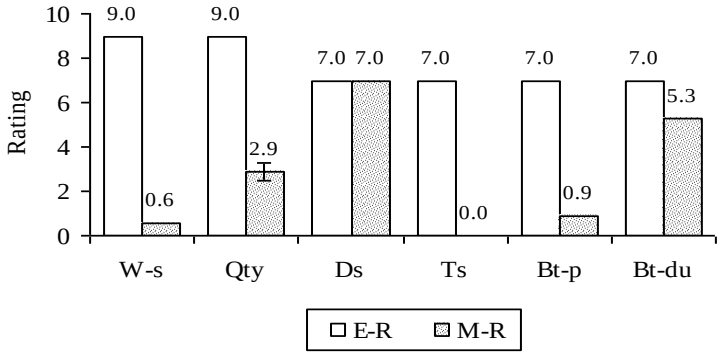
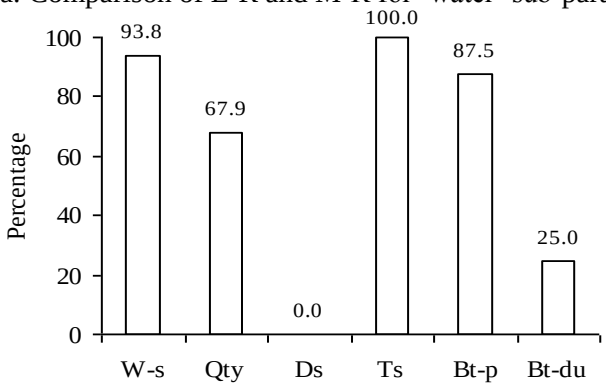


Figure 6a: Comparison of E-R and M-R for 'water' sub-parameters



W-s: Source of perennial free-flowing water Qty: Quantity of water provided
Ds: Distance to source Ts: Testing of water samples Bt-p: Bathing place
Bt-du: Bathing duration

Figure 6b: Percentage wise deviation from E-R for 'water' sub-parameters

Sleep related features

Excessive or little sleep may indicate signs of sickness, bad sleeping conditions such as unsuitable floors may add to health problems.

- Sleeping place was the *Pilkhana*
- Sleep duration was 4h and during the night.
- The elephants were tied with a 3m chain during this period

M-R for two sub-parameters was: sleep area (M-R = 1.0, SE= 0.0, N= 119) and sleep duration (M-R = 8.0, SE= 0.0, N= 119). There was 88% deviation from E-R for sleep area and no deviation for sleep duration.

Walk

Wild elephants have been observed to traverse several kilometers while foraging/ engaging in other activities (Poole and Granli, 2009). When animals known to be active for most parts of a day are not provided an opportunity to walk or move about, it may result in health and psychological problems.

- All the elephants were walked on tarred roads as part of their work routine (Figures 9a,b,c,d,e,f,and g)
- Distance from *Pilkhana* to work was around 4km
- All the animals were walked by their mahouts/ cawadis

M-R for the two observed sub-parameters was: Opportunity to walk (M-R= 9.0, SE= 0.0, N= 119) and time of walk (M-R = 2.0, SE= 0.0, N= 119). There was no deviation for the first sub-parameter while there was 75% deviation for the second sub-parameter.

Social interaction

Elephants are considered to be social animals, maintaining long-lasting relationships across generations (Sukumar, 2003).

- All the observed elephants were allowed opportunity for interaction (Figures 10a,b,c,d,f,g and h)
- Data on related aspects such as duration, number of individuals and distance from each other, was not available
- Duration depended on work schedule, after work the elephants were chained in close proximity
- Only owners with more than one elephant enabled any sort of interaction for their animals

M-R for opportunity to interact was 7.9 (SE= 0.1, N= 22) with a deviation of 1.3% from E-R.
M-R for duration of interaction was 3.5 (SE= 0.0, N=22) with a deviation of 50% from E-R.

Chaining

Elephants in captivity are subject to periods of chaining as a means of management. Their ability to move by choice is severely restricted by this practice.

- All elephants were said to be chained (Figures 11a, b and c) in the leg region
- Region of chaining varied from chaining front leg with 3m chain and back leg with rope / chain to never chained on back leg
- Elephants were chained when in the *Pilkhana*
- While walking/ and working, not chained
- None of the elephants were allowed to free range

M-R was 0.3 (SE= 0.3, N = 3) implying a deviation of 96% from E-R (Figures 7a and b).

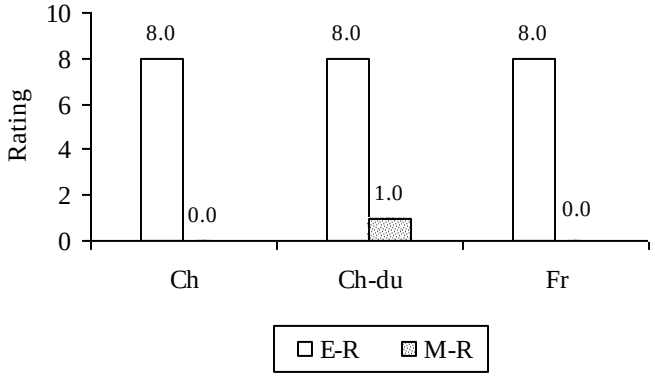
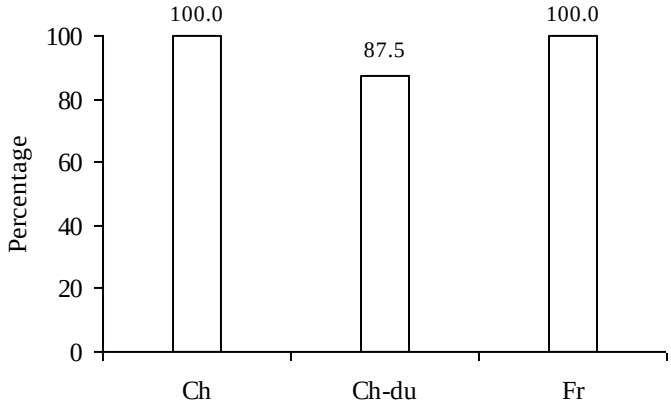


Figure 7a: Comparison of E-R and M-R for 'chaining' sub-parameters



Ch: Chaining status Ch-du: Duration of chaining Fr: Opportunity to free-range at night

Figure 7b: Percentage wise deviation from E-R for 'chaining' sub-parameters

Behaviour

Manageability of elephants, occurrence of aggression towards people and occurrence of stereotypy was considered for rating.

- 13% of the elephants (N=115) were described as aggressive and/ or nervous, the remaining were said to be friendly

- Three adult female elephants had injured/ killed people, while two adult females had attacked other animals
- 10-15 elephants were said to exhibit stereotypic signs of medium intensity

M-R was 3.7 (SE = 2.5, N*= 3) showing a deviation of 54% from E-R (Figures 8a and b).

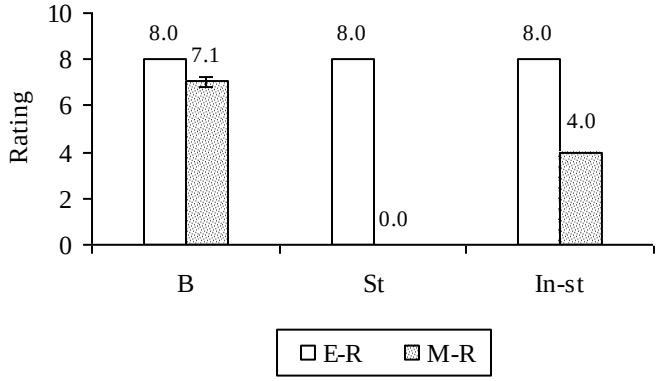
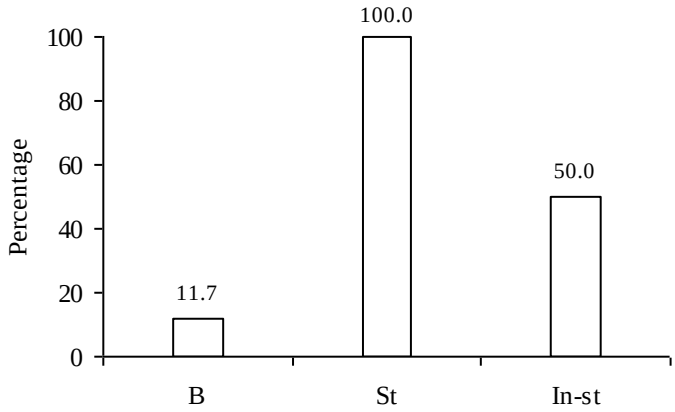


Figure 8a: Comparison of E-R and M-R for 'observed' behaviour



B: Observed behaviour St: Occurrence of stereotypy In-st: Intensity of stereotypy

Figure 8b: Percentage wise deviation from E-R for 'behaviour' sub-parameters

Work

A captive elephant's nature of work determines, to a large extent, its living conditions and location.

- All the elephants were used for tourism related work (Figures 14a,b,c,d,e,f,g,h and i) — providing rides, attracting tourists; they were also hired out to festivals/ functions, the animals were made to seek money from the public
- Tourist rides involved carrying two persons for a distance of 100m using a howdah (saddle) weighing 100kgs; howdah was made of iron pipes enclosing bedding material
- Place of work and shelter were not the same— work was said to be situated 3-4 to 6km from the *Pilkhana*

- Elephants were worked all days of the week with the main season said to be March-May; average temperature during period varies from 31-40°C
- No shade/ water was available while working
- Food provided while working was Sugarcane (*Sacharum* sp.), sorghum or jowar (*Sorghum bicolor*) straw, Lucerne (*Medicago* sp.)
- By 2009, the number of tourists per ride was reduced, restricted number of trips and no tourists were carried on the way down from the fort in Amer; shade was provided at the resting place between trips

M-R was 1.3 (SE= 0.0, N*= 6) showing a deviation of 83% from E-R (Figures 9a and b).

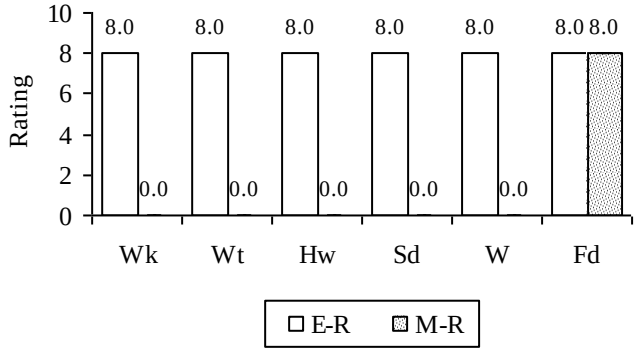
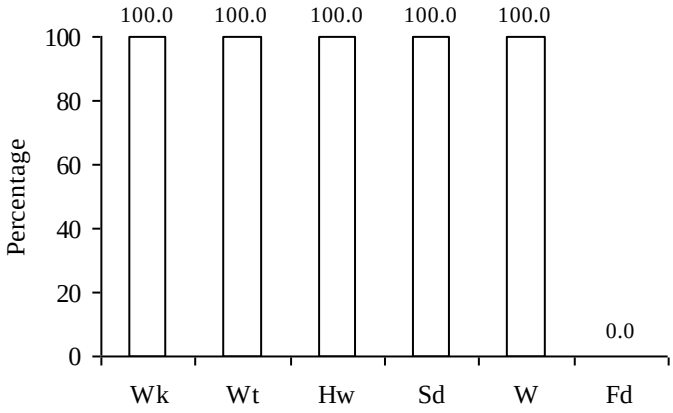


Figure 9a: Comparison of E-R and M-R for 'work' sub-parameters



Wk: Work type Wt: Maximum weight carried Hw: Howdah type
Sd: Shade availability during work
W: Water availability during work Fd: food availability during work

Figure 9b: Percentage wise deviation from E-R for 'work' sub-parameters

Provision of food

Being generalist in their feeding habits (Sukumar, 1991); wild elephants have been observed to feed on a wide variety of plants. In captivity, not only is such variety missing but also the performance of species-typical foraging behaviour is curtailed by the use of stall-feed. In terms of management, usage of ration charts can help in maintaining a record of the food eaten by the elephants (across different health states).

- All the elephants were given only stall feed and see Figures 16a,b,c,d,e and f for types of food given to elephants in Jaipur
- Food given included Jowar/ Sorghum straw, Jaggery (sweet derived from sugarcane), Chapatti (a kind of roasted bread made of wheat) and sugarcane
- Mineral mix was not given daily, it was need based;
- Feeding duration was 18-20h (in the *Pilkhana* and while working)
- Feeding place was cleaned daily
- By 2009, the elephants were provided with a mixture of browse and grass, thereby, reducing the occurrence of constipation/ impaction; mineral mixture was provided

M-R was 1.9 (SE=1.1, N*= 4) with a deviation of 79% from E-R (Figures 10a and b).

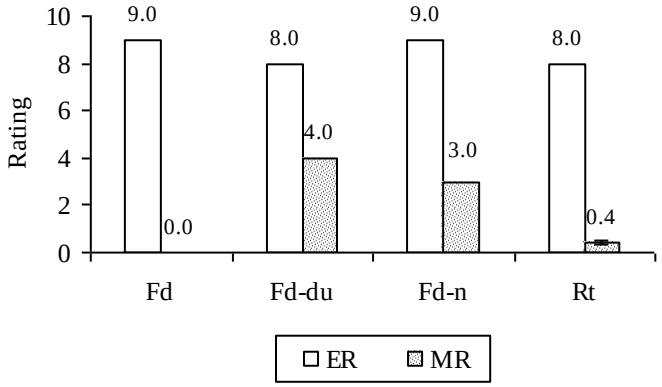
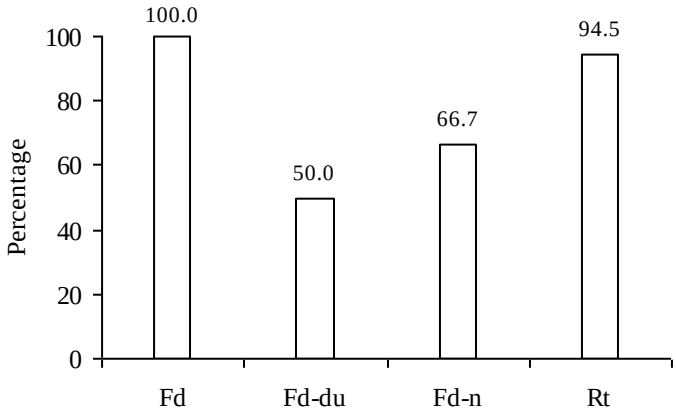


Figure 10a: Comparison of E-R and M-R for 'food' sub-parameters



Fd: Food provisioning type Fd-du: Feeding duration
Fd-n: Number of food items Rt: Ration chart usage

Figure 10b: Percentage wise deviation from E-R for 'food' sub-parameters

Reproductive status

Normal reproductive functioning in adult elephants can be considered to be a sign of health. In captivity, various causes like social isolation, poor nutrition, stress, etc., have been associated with poor reproductive success.

- Among the 112 adult females, status of only three elephants was known; all three had given birth; these elephants were already pregnant when they were brought into Jaipur (Figure 18), two from Uttar Pradesh and one from Arunachal Pradesh; of the calves born two were alive
- Data regarding status of oestrus cycles/ mating observed/ pregnancy of other female elephants was not available
- Among the males, three were said to exhibit musth symptoms annually
- The males were isolated and chained while in musth

M-R was 4.6 (SE= 2.8, N*= 3) with a deviation of 42% from E-R being observed (Figures 11a and b).

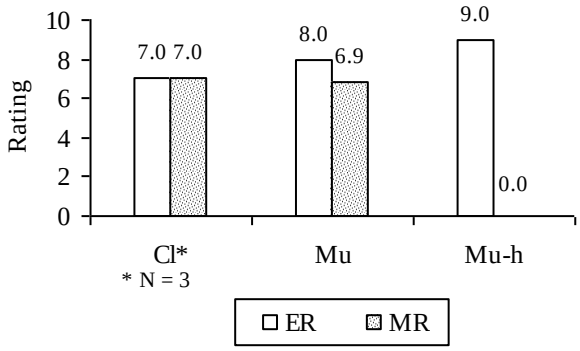
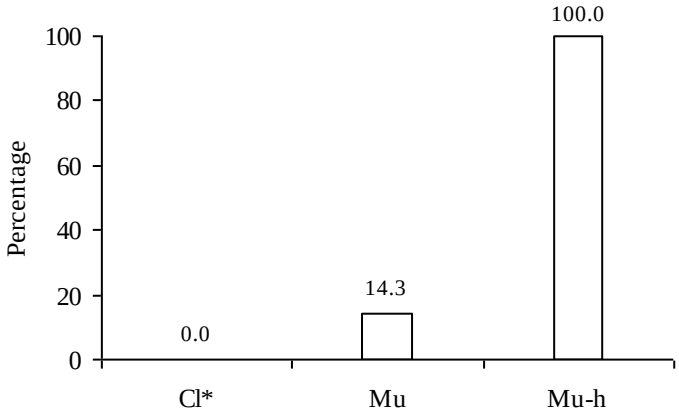


Figure 11a: Comparison of E-R and M-R for 'reproductive' status sub-parameters



Cl: Calves born/ not Mu: Occurrence of musth Mu-h: Handling of musth

*: Data based on observations of three elephants only

Figure 11b: Percentage wise deviation from E-R for 'reproductive' status sub-parameters

Health status

Physical health of the elephants is important not only in terms of survival but also for its effect on psychological well-being. Regular adherence to prescribed veterinary schedules helps in maintaining health.

- Ninety percent of elephants had one or more of the following problems (Figures 20a,b, c,

- Figures 20 d and e): foot pad / eyes/ were observed to have abscesses/ wounds from the howdah
- All the elephants had been dewormed with Albendazole/ Fenbendazole (three times/ year), immunized against Tetanus, oil applied on head and body weekly or seasonally, biochemical tests of blood done annually
- Body condition was described as average for 68% of the elephants
- Five adult females, aged between 30-50y, had died by the year 2009
- The 2009 report states that all the elephants were dewormed every quarter, veterinary care was timely which resulted in maintaining the health of the elephants; the body condition of elephants was described as good; the addition of Lucerne and sugarcane helped in reducing the occurrence of eye lesions and improved skin condition

M-R was 6.2 (SE= 0.9, N*= 9) implying deviation of 12 % from E-R (Figures 12a and b).

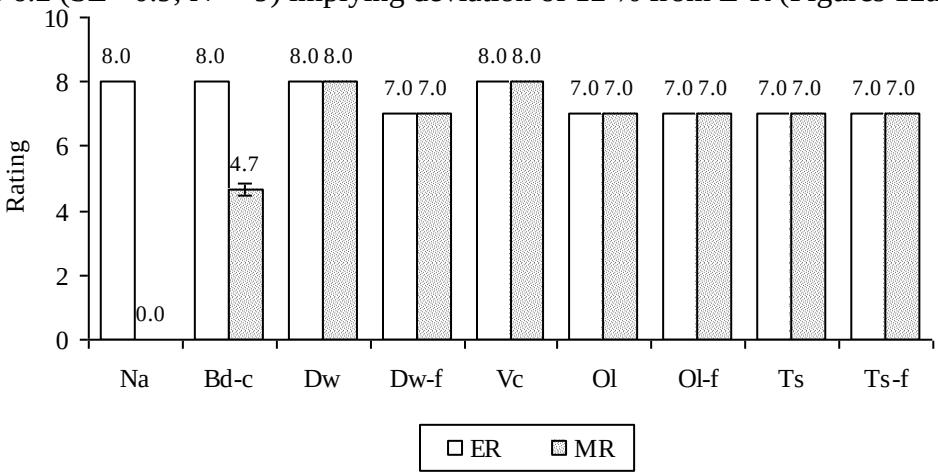
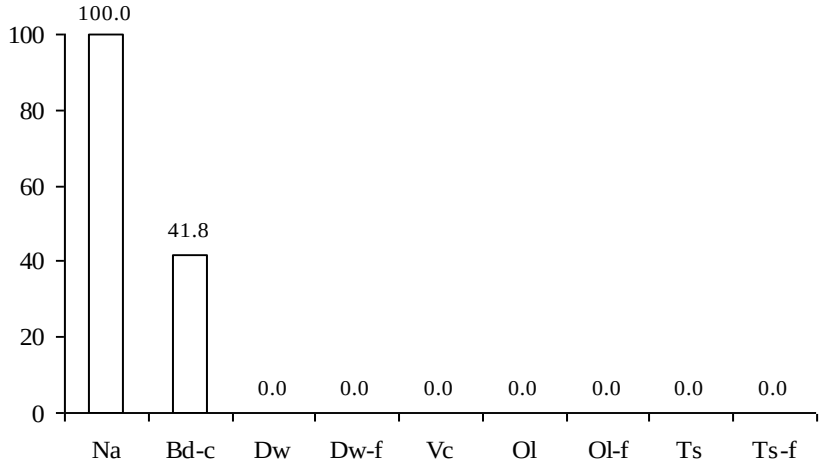


Figure 12a: Comparison of E-R and M-R for 'health' sub-parameters



Na: Nature of disease/ injury Bd-c: Body condition Dw: Deworming status
Dw-f: Frequency of deworming Vc: Vaccination status Ol: Oiling status
Ol-f: Frequency of oiling Ts: Tests of blood/ dung/ urine Ts-F: Frequency of tests

Figure 12b: Percentage wise deviation from E-R for 'health' sub-parameters

Veterinary care and infrastructure

Availability and access to doctors with relevant experience is integral to maintaining health of elephants. Facilities (relevant to veterinary practice and infrastructure) are just as important. Availability of funds and expenditures have been considered as they form the central part of any captive elephant situation. Usage of funds for maintenance of a natural set-up with few accessory expenses involved has been considered to be ideal.

- A veterinary doctor was available for all the elephants with 6y experience in treating elephants
- Frequency of doctor's visit was daily
- Veterinary assistant was not available
- Following facilities were available: staff quarters, cooking shed, provision shed, camp site, mobile veterinary clinic (Figure 22)
- Service/ Health/ Medical Records were maintained
- Funds: Owners earned money from the tourist rides at Amer which was Rs.570/ ride. Of this, Rs.450/- was taken by the owner.

M-R was 5.4 (SE= 0.0, N*=9) with a deviation of 32% from E-R (Figures 13a and b).

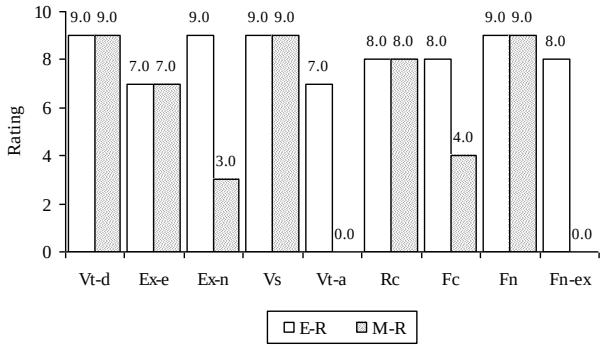
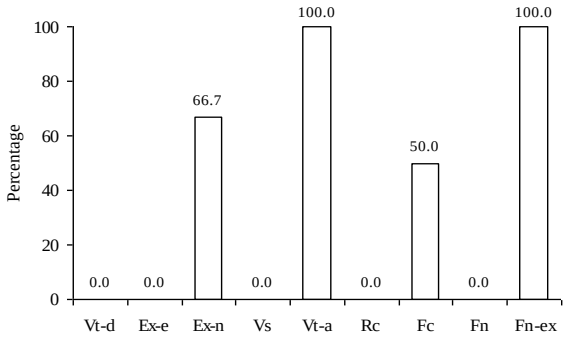


Figure 13a: Comparison of E-R and M-R for 'Veterinary care and infrastructure' sub-parameters



Vt-d: Availability of veterinary doctor Ex-E: Experience with elephants
Ex-n: Number of years of experience VS: Frequency of visits
Vt-a: Availability of veterinary assistant Rc: Maintenance of records
Fc: Facilities available Fn: Availability of funds Fn-ex: Expenditure of funds

Figure 13b: Percentage wise deviation from E-R for
'veterinary care and infrastructure' sub-parameters

Each of the sub-parameters considered has been compared with an E-R and any deviation noticed is indicative of the deviation from what the experts consider to be a situation suitable for elephants in captivity. Figure 14 gives the distribution of this deviation across the sub-parameters observed. It can be seen that more than half of the total sub-parameters (total =56), that is, 31 sub-parameters show a deviation of 60% or more from E-R. Only 19 sub-parameters show a deviation of 20% or less from E-R.

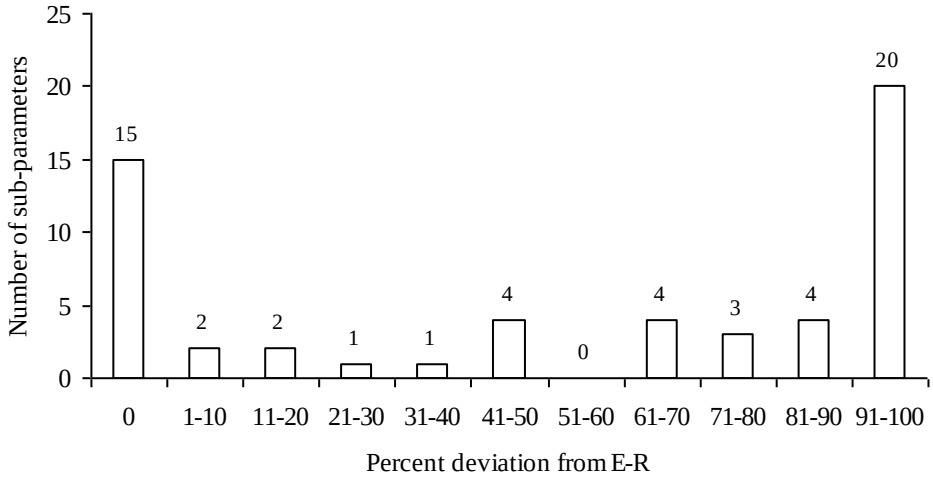


Figure 14: Distribution of percentage wise deviation from E-R across all sub-parameters

Overall rating for elephants

The welfare status of elephants maintained in Jaipur has been evaluated by considering the deviation from the living conditions observed for wild elephants. The overall M-R (considering all parameters together across all observed elephants) was 3.7 (SE= 0.5, N*= 55) which shows a deviation of 50% from E-R. Thus, irrespective of the parameter, there was a difference of 50% from the norm for the observed elephants.

Handlers' experience and socio-economic status

Mean age of handlers was 29.1y (SE= 0.7, N= 116) ranging from 18-57y. Most handlers (65%) were also trained as *phandis* (elephant catchers using noose).

Experience:

An inexperienced handler and an aggressive elephant may prove to be a dangerous and lethal combination. Even if the elephant's temperament is not aggressive, lack of knowledge about the elephant may result in poor care.

- Age when each began working with elephants ranged from 0-40y (Mean = 14y, SE= 0.7, N = 111).
- Mean duration with current elephant was 3.2yrs (SE= 0.4, N= 104) ranging from 0.16-20yrs.
- The number of elephants handled before the present one varied from one to three. Experience in Jaipur (mean = 10.4y, SE= 0.8, N= 106) was comparable with other places (mean = 9.1y, SE= 1.2, N=50).
- Nearly 50% of handlers took up this profession as they could not find any other means of employment

- Most (74%) were confident of handling problematic elephants
- 54% of handlers did not want to change their profession
- The use of ankush was widespread resulting in ankush wounds on elephants; in 2009, this use was restricted and handlers were provided information on positive reinforcement training

M-R was 4.4 (SE= 1.9, N*= 3) indicating a deviation of 49% from E-R (Figures 15a and b).

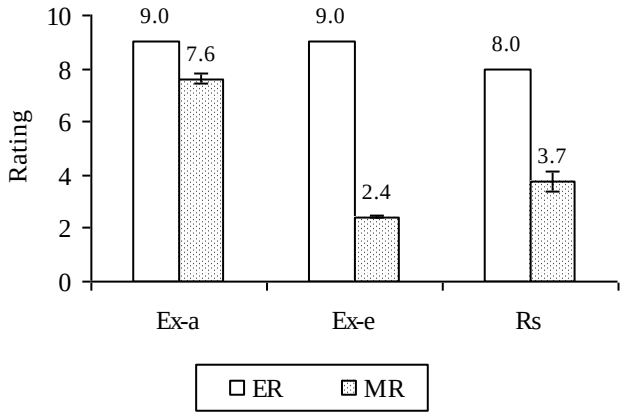
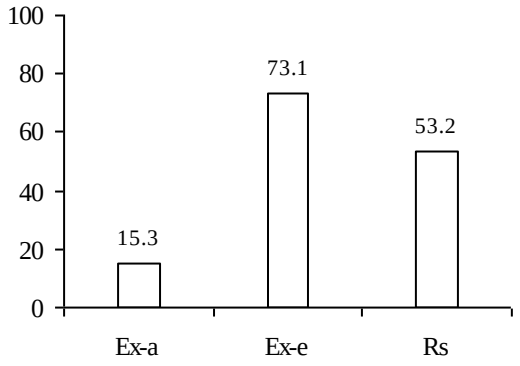


Figure 15a: Comparison of E-R and M-R for handler experience



Ex-a: Experience as % of handler age Ex-e: Experience as % of elephant age
Rs: Reason for choosing this profession

Figure 15b: Comparison of E-R and M-R for handler experience

Socio-economic status

Lair (1997) states that mahouts hired to handle elephants are usually poor as opposed to those who own and handle their elephants. Poor remuneration or an impoverished state may lead to overexploitation/ neglect of the elephant. Along with remuneration, features such as education level, marital status and liquor consumption habits were rated.

- Only 28% (N= 108) of handlers were educated

- Mean monthly salary was Rs.1356/- (ranging from Rs800 to 8000/-) with 82% handlers earning less than Rs.2000/- per month; handlers expected a salary of Rs. 1500 to 7000/- per month
- All handlers earned extra through tips
- 80% of handlers did not want their children to work in this profession
- Monthly expense ranged from Rs.400 to 6000/- (mean = Rs.2590/-)
- Mean number people in the house was five, ranging from 1-12
- Mean number of children per household was three, ranging from 0 – 10; the number of sons/ daughters born was similar, with sons surviving better than daughters.
- Wives of handlers did not work outside, all were housewives
- Handlers were said to use intoxicants like cannabis/ alcohol

A training program was organized, according to the report in 2009, for handlers on methods of treating elephants for common ailments such as wound dressing/ foot-care/ maintaining shelter hygiene

M-R was 3.1 (SE= 1.3, N*= 3) indicating a deviation of 55% from E-R (Figures 16a and b).

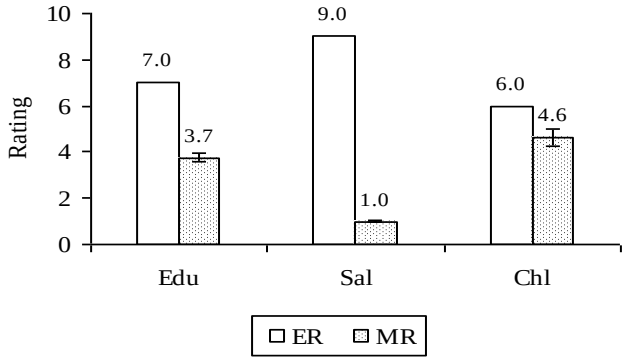
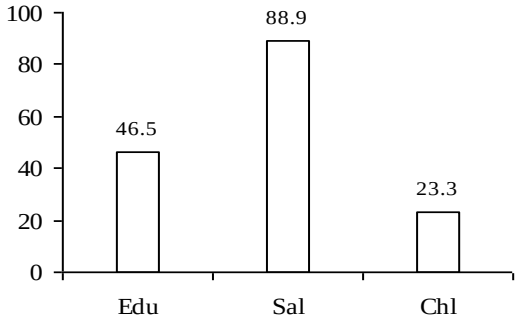


Figure 16a: Comparison of E-R and M-R for handler socio-economic status



Edu: Education status Sal: Salary drawn Chl: Number of children

Figure 16b: Percentage wise deviation from E-R for socio-economic status of handler

Discussion

The differences in living conditions (physical/ social) experienced by elephants in captivity can be compared with the lives of free-ranging wild elephants, and can be used as being indicative of the stress/ trauma undergone in captivity (Bradshaw, 2007).

Parameters which showed 75% or more deviation from E-R:

- Source of elephants: all the elephants had been shifted from different locations with 58% spending 5y or less in Jaipur. The elephants would have had to acclimatize to the hot, dry conditions in Jaipur.

Pinter-Wollman et al., (2009) studied the effects on wild elephants translocated from a humid, equatorial climate to a semi-arid area in Kenya. It was found that the translocated elephants' body condition was significantly lower than that of the resident population with no difference in stress hormone levels.

Shifting from one region to another may involve change in management routines/ work schedule/ breakage of established bonds among elephants in the previous location.

Most of the handlers in Jaipur spent between 1-5y only with his elephant indicating added change in the elephants' lives in the form of frequent change of handler. Thus, the elephants would have to adjust to a changed living environment and a different handler frequently.

Both these factors (change of location and change of handlers) are sources of physical/ physiological/ psychological stress to the elephants.

- Shelter: the region of Jaipur is not a natural range area for elephants as wild elephants have not been reported from this area. Added to this alien environment, the animals were housed in shelters with unsuitable floors, restricted space and absence of a natural, vegetated environment. For animals evolved to travel several kilometers across varied natural habitat, restriction in limited man-made space can be a source of stress (Bradshaw, 2007).

- Source of water: none of the elephants had access to sources which promoted expression of species-typical behaviours such as bathing/ wallowing/ provision of rubbing posts. In fact, the quantity provided was described as being insufficient for 68% of the observed elephants. Inadequate water availability can be life threatening in arid regions, a fact of significance considering the poor thermo-regulatory capability of the elephants' skin, also their inability to move and access water as a consequence of chaining or their work schedule.

- All the elephants were chained when not working, without any opportunity to free range implying forced helplessness with regards to accessing resources such as water/ companions/ suitable space. Gruber et al., (2000) states the increased frequency of stereotypy among chained animals as opposed to those that were penned. In addition, persistent chaining can lead to abrasive injuries (Kurt and Garai, 2007) which may be difficult to heal.

- Absence of free-ranging opportunity meant no provision to graze/ browse in suitable habitat. Wild elephants are known to be active for most parts of a day (Poole and Granli, 2009) spending 12-18h of a day (Sukumar, 1991) in foraging/ feeding. Hence, just providing stall feed for 18-20h in captivity may not be suitable for two reasons— lack of mental stimulation in the absence of ability to move and engage in species-typical activity and a potential deficiency of exercise for elephants that are chained when not working

- Work: all the elephants were used for work: carrying tourists, taking part in festivals/ seeking money from the public, etc. While this may seem innocuous enough, chances of overworking elephants to generate income can be real, more so, when the funds generated from this activity had to be shared between the owner/ handler and used for maintaining the elephant. In addition, there was no shade or water availability while working – a serious handicap considering the ambient temperature of Jaipur during daytime.

- Disease/ disorder noticed in elephants in Jaipur:

Common problems noticed among the elephants were:

  - Foot-rot
  - Foot-pad/ toe nail problems
  - Lameness
  - Abscesses/ lacerated wounds
  - Death of five adult female elephants by 2009

Olson et al., (1994) state regular care of the feet is needed to prevent overgrown soles/ nails/ penetration of foreign bodies/ abscesses / foot-rot. Absence of care can lead to persistent infection and even death. It is significant to note that despite provision of regular veterinary care, elephants in Jaipur in the prime of their age showed the above mentioned injuries. This could be related more to the management/ husbandry practiced with these elephants.

In an earlier study of the health of Jaipur elephants, Ashraf et al., (2001) noted that nearly 36% of the observed elephants had eye related problems. In this study, the occurrence of eye associated disease/ disorder was around 15%. This is an indication of the improved health status as both studies involved the same elephants.10 of the 12 elephants however, having eye problems in this study were between 20- 40y, a prime age for long-living elephants.

The situation for elephants in Jaipur is replete with forced alien conditions: frequent shifting of locations, changes in mahout, unnatural living conditions with little provision for expression of species-specific behaviours, all-pervasive influence of human control on all facets of the animal's life— factors that may pre-dispose the elephant to stress (psychological and physical) leading to poor welfare and reduced life span.

Mahouts/ Handlers

- Frequent change of handlers for each elephant can endanger the life of the animal/ the handler as each needs to undergo a period of adjustment. It is not known why such changes were observed for elephants in Jaipur.

- Salary paid to mahouts showed a deviation of 89% from that recommended by experts. This deviation becomes even more significant as each household had a mean of five persons.

Reference

1. Ashraf, N.V.K., Cheeran, J.V., Ramanathan A. and Dutt, B. (2001) Captive concerns health and management of captive elephants in Jaipur, An occasional report of a training camp conducted by the Wildlife Trust of India, supported by Help in Suffering, Jaipur and Department of Tourism, Govt. of Rajasthan
2. Bradshaw, G.A. (2007). Elephants in circuses: analysis of practice, policy, and future, Policy paper, Animals and Society Institute.
3. Cheeran, J. V. (2009) Jaipur elephants- welfare status 2009, Report submitted to Elephant Family, U.K. and Help In Suffering, India.
4. Kurt, F. and Garai, M.E. 2007. The Asian elephant in captivity—a field study. Foundation books, Cambridge University press, New Delhi.
5. Lair, R.C. (1997). Gone Astray - The Care and Management of the Asian Elephant in Domesticity. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand.
6. Mikota, S.K., Sargent, E.L., and Ranglack, G.S. (1994). Medical management of the elephant. Indira Publishing House, U.S.A.
7. Olson, D., Keele, M. and Tuttle, D. (1994) Husbandry and management In: Medical management of the elephant (Mikota, S.K., Sargent, E.L., and Ranglack, G.S., eds.), Indira Publishing House, U.S.A.
8. Pinter-Wollman, N., Isbell L.A., and Hart L.A. (2009) Assessing translocation outcome: Comparing behavioral and physiological aspects of translocated and resident African elephants (*Loxodonta africana*), 142 1116–1124
9. Poole, J. and Granli, P. (2009). Mind and Movement: Meeting the Interests of Elephants. In: An elephant in the room: the science and well being of elephants in captivity, (Forthman, D.L., Kane, F. L., Hancocks, D., and Waldau, P.F. eds.) Center for Animals and Public Policy, Cummings School of Veterinary Medicine, Tufts University
10. Poole, T. and Taylor, V.J. (1999). Can the behavioural needs of Asian elephants be met in captivity? Zoo's Print: I-XIV (3-12).
11. Sukumar, R. (1989). Ecology of the Asian elephant in Southern India. I. Movement and habitat utilization patterns. Journal of tropical Ecology. **5**:1-8.
12. Sukumar, R. (1991). Ecology. In: Eltringham, S.K. (ed.) The Illustrated Encyclopedia of Elephants, Salamander Books, U.K. Pp.78-101.
13. Sukumar, R. (2003). The living elephants. New York: Oxford University Press
14. Varma, S. 2008. Identifying and defining welfare parameters for captive elephants and their mahouts in India, In: 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. (Varma, S. and Prasad, D., Eds.), A joint publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
15. Varma, S. and Prasad, D. (2008) Welfare and management of elephants in captivity—insights and recommendations, In: 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. (Varma, S. and Prasad, D., Eds.), A joint

publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.

16. Varma, S., Sujatha S.R., van de Brand, J., Ganguly, S. and Shiela R., (2008) Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India, In: 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. (Varma, S. and Prasad, D., Eds.), A joint publication of Project Elephant, Ministry of Environment and Forests (MoEF), Government of India, Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF), Bangalore, India.
17. Weissenbock, N. M., (2006). How do elephants deal with various climate conditions? Previous results, recent data and new hypotheses**,** Vienna Zoo – Tiergarten Schönbrunn, Vienna, Austria, Europe

Websites referred:

1. http://www.rajasthantourism.gov.in/Attractions/Fairs-Festivals/ElephantFestival2.aspx
   http://www.vwb-vsf.ca/english/documents/spring09newsletter_000.pdf

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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 do what may be required to alleviate their suffering at the hands of humans. CUPA does not differentiate among pet, stray or wild animals, since all of them 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 governmental 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 procured information, knowledge and inferences in professional, academic and public fora.

College of Veterinary Science, of Assam Agricultural University, under the Faculty of Veterinary Science, has celebrated its Golden Jubilee Year in 1998 and during its 50 years of existence the college has contributed immensely in the human resource development for not only the state of Assam but also for the entire North Eastern Region and the country as a whole. The faculty is contributing immensely towards the cause of conservation in the region by mostly taking care of the captive and free range elephant wealth of the region, rhino translocation etc. and also playing a pivotal role in the country in training of manpower in handling wildlife healthcare and managerial issues.

Elephant Welfare Asociation (EWA): is a not-for-profit charity organization, based at Thrissur, Kerala. Since 13 years, under the expert guidance eminent elephantologists, Dr.K.C.Panicker, Dr. J.V. Cheeran, and Dr. K. Radhakrishnan, the organization is working towards ensuring welfare of captive elephants in Kerala, welfare of handlers, providing veterinary and health care and crisis management in situations involving elephants. EWA works with various government and non-government agencies to ensure elephant well-being. It undertakes capacity development programmes for owners, handlers and the public. EWA also provides literary information on elephants and its associated features, to the public, through its library which holds a collection of books, periodicals and scientific materials.

Elephant Care Centre (ECC): is a registered charitable trust founded with the objective of caring for and rehabilitating captive elephants that are physically and psychologically incapacitated to work and provides shelter to terminally ill elephants. The trust also helps in retraining "rogue" elephants, developing alternative (elephant friendly) employment sources, low cost food sources, building awareness on captive elephant issues. It is located in Palakkad district, Kerala.

Help in Suffering: The Help in Suffering (HIS), a charitable trust, has marked 25 years of service to the protection and welfare of street animals in Jaipur, Rajasthan. HIS spends Rs 4 lakhs per month on various projects with 5 vans touring the city areas daily to bring in animals that are suffering and need veterinary intervention. HIS works on the streets, picking up dying puppies from the gutters, saving dogs from being poisoned and any other animals that may need help. One of the long term dreams of the organization is to build an elephant refuge for those elephants that can no longer work. Funds and exchange programmes from UK, France, and USA give HIS a wonderful international network, leaving all the people involved, with hands on learning experience with animals like camels and elephants. They depart carrying with them the amazing spirit of survival so typical of this country.

Elephant Family: Registered in 2002, *elephant family* has developed into a focused force for the endangered Asian elephant. Elephant family vision is a world in which the Asian elephant is no longer an endangered species and is able to live unthreatened within its own habitat. Elephant family currently supports a number of projects across India, Indonesia, Malaysia and Thailand. Elephant family's activities range from securing vital wildlife 'corridors' and helping remote farming communities to live safely inside wild elephant territory, to rescuing abused street elephants and providing free veterinary care. These projects fall under three core areas of work: (1) habitat conservation; (2) health & welfare; and (3) education. E*lephant family* only partners with rigorously selected grassroots organizations best equipped to achieve significant results on the ground.

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 challenge global animal welfare issues. It has 13 offices and thousands of supporters worldwide.

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There has been no initiative so far to study the ecological and physiological needs of elephants in a deviant environment which is in sharp contrast to their natural environment. Elephants owned by private individuals and institutions account for a considerable percentage of the estimated captive population in India. This investigation aimed to assess the welfare status of captive elephants and the professional experience and socio-economic status of handlers of under private ownership across 6 states in India. The welfare status of 775 elephants belong to this category was assessed by comparing the captive environment with that of the wild. The conditions for elephants in captivity are quite different from those available in the wild. This deviation has been used in comparison with their current status to suggest any remedial measures to improve their well-being.