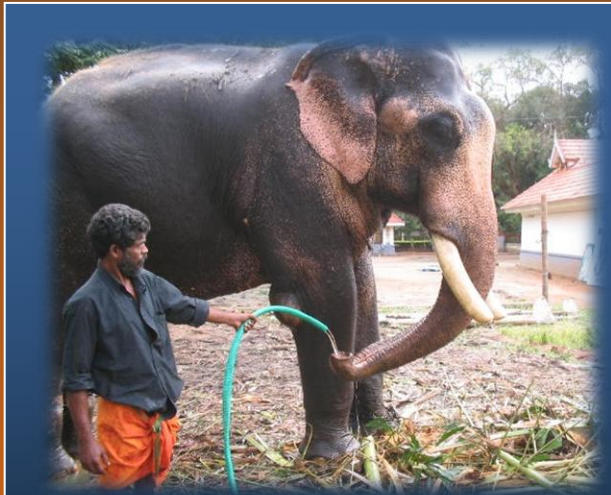


Captive Elephants of Temples of India



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An Investigation into
the Status,
Management and
Welfare Significance



Elephants in Captivity-CUPA/ANCF -
Technical Report. No.13



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Elephants in Captivity-CUPA/ANCF -Technical Report. No.13



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Preface

Temples have a long history and tradition of keeping elephants. Some temples keep elephants as they have a significance associated with a specific deity. However, the actual time when temples started associating themselves with elephants is not very clear. Interestingly, the actual reasons for which elephants are kept in temples need to be critically reviewed. The review is important, whatever the reasons, as it could define actual welfare status. Among other reasons, elephants are kept in temples to carry water from river for the daily ritual and bathing of the deities. A hypothetical supposition on the advantage of using them for this purpose is that someone holding a huge vessel that contains water can sit on the top of the elephant and make the elephant to carry the person and the vessel from the river to temple. In the olden days, most of the temples were located close to rivers and there were no proper modes of transport of water to temples. Elephants, in addition to carrying material, acted as a good transport mechanism they were able to go up to sanctum sanctorum of the temple which could not be achieved even with a good road network from the temple to river. Traditionally, except for helping in carrying water, no other work was associated with them; they were made to stand near temple during auspicious hours. After this, they were allowed to range free in the forest associated with the temple.

Most temples maintain female elephants. There are reasons for keeping only specific sex in temples. Male elephants are not selected due to the occurrence of musth for a considerable time in a year resulting in the elephants not being able to do any temple duties including carrying water from the river. So, female elephants were the best choice; however, one problem with female elephants was exposure to males and consequent pregnancy. Post-delivery, taking care of their calves would take up substantial time and the female elephants may not be available for any temple related duties. So, this may be one of the reasons temple kept female elephant alone, in social isolation. As times changed, temples lost their forest cover and source of water. Some of the temples are constructed in city limits in the middle of sea of human. The tradition of keeping elephants continued, without any defined work for the animals. Some of the temples that were not able to generate resources, even to give salary for their mahouts, knowingly or unknowingly, permitted mahout to generate resources by making elephants to bless devotees or perform other tasks for the public. Elephants, with the combination of control by the mahout and their liking for the food offered by devotees, had to allow exploitation by mahout.

Elephants, in addition to being made to continuously bless people, are made to stand for long hours on concrete surface. The shelters provided to them are very small, closed, with no or less ventilation. Even if there were modifications providing semi-open structures and artificially created mud floors, they are made to stand for long hours in the middle or are surrounded by food waste, their own excreta. The food coming primarily from devotees was restricted to a few varieties and biased towards high calorie values. Even with good intentions of offering food for elephants, there are no controls for hygienic status of food given by the devotees. Elephants are made to walk to reduce the regular routine of standing in one place for a long time; however the scope available for them to walk is only on tar or metal roads within crowded or congested city limits. A highly social species that fulfills its needs by social and environmental clues is kept alone throughout its life or only allowed fragmented interaction. Importance of fulfilling their needs through social and environment clues can be seen from a simple example: if elephants live together, and there is a water

source (environmental clue) around and if one elephant goes for drinking, that act makes other the animal (social clue) to drink water. All these aspects, even before initiating a study on welfare of elephant's points towards the poor welfare status temple can offer.

However, the subject of captive elephants in temples and religious institutions and the scale in which the welfare is lost in temple in India has never been detailed or documented before in a scientific manner. For decades, elephants have contributed as an attraction of institutions and signified glamour for the thousands of devotees who visit these places. For the first time, an objective attempt has been made to understand the physical environment these elephants inhabit and the opportunities that may be present for their wellbeing and health in such places. The parameters against which the conditions have been evaluated have been rigorously researched, data painstakingly collected over many years and the process filtered and peer reviewed by eminent experts as well as temple managers, mahouts and veterinarians with elephant specific knowledge.

This document has six sections: section one deals with overall population status, management and welfare of captive elephants that were investigated in Andhra Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu. The first section along with the executive summary also provides recommendations for the state. Section two describes welfare status of elephants and handlers in Andhra Pradesh, section three is for Karnataka, section four for Kerala, section five is for Maharashtra and section six is for temple elephants from Tamil Nadu.

We believe this investigation and the resultant document will help in drawing in some welfare measures and prevent temples that have no natural flooring, natural surrounding from maintaining elephants, and also encourage elephants to be kept together and to be used only during temple ritual hours.

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Section 1:
Captive Elephants of Temples of India

Executive Summary

Among different owners of captive elephants in India, temples play an important role in maintaining elephants. All India Captive Elephant survey (conducted by CUPA-ANCF-WSPA) from 2005 – 2011 collected relevant data on temple elephants to develop a profile of welfare status of temple elephants in terms of physical and biological features provided in captivity. It also gave a scope for collecting information on the professional experience and socio-economic status of handlers (mahouts/cawadis).

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. The data was processed 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.

A total of 267 elephants belonging to five states and 112 temples were observed for population demography data. It should be noted that temple elephants from Kerala contributed 62% of the total population. Maximum number was accounted for by adult males (16-40y; 35% of a total of 267). The same age group among females accounted for 18% of the total population. Older males (41-60y) accounted for 18% and the same age-group among females contributed 10% to the total. Sub-adult males and females occurred in equal numbers (8% each). There were no calves/ juveniles among male/female elephants. The ratio of male: female was 1:1 for sub-adults, falling to 1:0.52 (16-40yrs), 1: 0.56 (41-60yrs) and 1: 0.4 (>60yrs).

Details available for those animals for source (of animal) indicate female elephants of temples had been purchased or donated. Similar was the situation for all male elephants, except one which had been rescued in 1936. Mean Rating (MR) for source (in terms of acquisition of elephants) was 1.5 showing a deviation of 75% from prescribed norms.

Of 143 elephants, 53% were confined in open space with no shelter; 34% had access to closed type shelter (with roof) and 81% were exposed to hard substrates (concrete/stone) with a deviation of 59% from Expert Rating (ER).

Fifty five percentages of elephants (of a total of 155 elephants) had access to a combination of rivers along with other sources—pond/lake/tap/tank/well and only 14% were bathed in rivers or streams. MR was 3.7 indicating a deviation of 54% from ER.

Of 133 elephants, 74% were given opportunity to walk, nature of terrain varied—roads (tarred/ mud), crop fields, forest areas and mean distance covered was 7km/day in a duration of 3.4hrs. MR was 4.3 implying a deviation of 52% from ER.

Eighty two percentages of elephants were allowed interaction with other elephants. Mean interaction duration was 5.4hrs and mean group size was 5.0. MR was 2.4 resulting in a deviation of 70% from ER.

Only 6% (n= 144) elephants were allowed to range-free as well as chained; the rest were not allowed to range-free. Fifty six percentages (n= 109) of elephants were chained using spikes or were hobbled by their fore-legs and mean chaining duration was 17.5hrs. MR was 0.3 with a deviation of 96% from ER.

Ninety six percentages of the elephants (n= 135) were used for work, work type involved various activities: Merely standing in front of temple, taking part in temple rituals/processions/ blessing public and mean work duration was 6.2hrs. MR was 2.4 showing a deviation of 70% from ER.

Only 5% (n= 149) elephants were allowed to forage as well as given stall feed. Stall feed types were boiled rice, flat rice, pepper, salt, ginglee oil, turmeric, rice, ragi, salt, sugar, mineral mixture, horsegram, green gram, coconut, normal grass, green fodder, sugarcane, fruits & vegetables, jowar, jaggery; depending on the temple, several combinations of these items were given. MR was 2.2 with a deviation of 76% from ER.

Occurrence of oestrus was reported among 38% females; only 15% were exposed to males. Of 26 females (considering data on observed mating/calf-birth) only five had given birth. Reproductively active of exhibition of musth was observed among 52% males and all elephants in musth were isolated and chained. MR was 1.6 (SE= 0.5, n*= 5) indicating a deviation of 80% from ER. MR refers to reproductive status considering both males and females together.

Of 46 instances of presence of disease/injury, 46% was accounted by foot/leg problems, 30% due to GI tract issues/presence of worms/respiratory problems, eye problems 13% and abscesses 11%. Fifty six percentages (n= 113) of veterinary doctors visited their elephant/s daily, 43% were on call/ visited monthly. MR was 3.8 showing a deviation of 53% from ER.

Mean age of handlers was 38.5yrs, mean experience in this profession was 15.2yrs, mean experience with most recent elephant was 11.4yrs and MR was 5.7 showing a deviation of 37% from ER.

Mean annual salary was Rs.30, 055/-, insurance cover was available for 81% (n= 173) of handlers and fifty six percentages of mahout reported alcohol consumption. MR was 4.8 with a deviation of 40% from ER.

Overall welfare rating for temple elephants (MR, considering all parameters together) was 2.8 showing a deviation of 64% from ER. Absence of features suitable to captive elephants for nine of the ten observed parameters indicates the extent of divergence from natural conditions in temples. Expression of species-typical behaviours can be curtailed in many ways.

Recommendations

Temple elephants are individually housed with usually not more than one elephant per temple. This is the first of many unnatural conditions that the temple elephant has to deal with. Working conditions are poor. The elephants are exposed to long hours of performing unnatural behaviours like blessing and seeking alms. They are made to stand still for long periods of time on concrete, asphalt and other hard flooring and they endure a lack of exercise, space and shade in their daily working conditions. These factors make the average temple and circus conditions the worst in managing captive elephants.

Most temple elephants suffer from isolation, a lack of space in living conditions and have no arrangements for exercise, bathing, free ranging or interaction. In fact, some elephants have no proper resting place even at night since the temple premises have restricted areas. Most temples with elephants are not able to provide optimal conditions, though they may have the financial resources to do so. This is because the needs of the elephants and those of the temples are disparate.

Overall animal care

Space

The physical space provided to elephants in temples is completely alien to the biology of the animal. All temples have stone flooring on which these elephants stand for long durations, never getting a chance to walk on natural substrates. Due to such unsuitable flooring, over 50% of the elephants suffer from foot rot

The practice of chaining elephants in temples is universal. Even when sufficient space is available, chaining confines the animal to limited space and prevents it from accessing any of the available resources around it (food/ water/ space/ companions). Even in their man-made enclosures, ventilation is not proper. It is generally a closed concrete building with insufficient height and no windows.

Temples should have exclusive housing with mud floors, high roofs, ventilation, and good drainage. It should be made mandatory for temples to change the floor of their elephant enclosures to a more natural earthen/ sand floor .At least during the day the animal should be kept on mud flooring or else alternative housing with mud or sand floors should be provided.

The animals should sleep on natural flooring and they should be in an area where it is possible for them to release body heat during the night

Those temples keeping elephants in areas least suited to their needs should be barred from having elephants in future.

Conditions existing at the temples need to be thoroughly evaluated before ownership is granted to applicants and the situation should be periodically reviewed by the Forest Department.

The living environment of the elephants should be properly maintained. There should be sufficient shade. Iron or asbestos sheets should not be

used for roofing. Nylon ropes or chains/hobblers with spikes or sharp edges should not be used

Temple /mutt / privately owned/ circus elephants could be housed permanently in forested and river-based regions. Many such housing facilities could be created across the state.

Food and Water

Food provided by devotees includes fruits, coconut, ghee, rice and other unnatural food (sweet, biscuits, and chocolates). This leads to obesity, indigestion, occurrence of colic and e.coli salmonella infections (unwashed hands of devotees could be a major cause).

Feeding of inappropriate food due to a lack of knowledge and awareness about proper nutrition often leads to severe health problems. A lack of sufficient supply of food due to faulty utilization or a lack of funds has often been observed in many private and government-owned temples.

Temples, instead of giving cooked food, may experiment with giving only natural food. However, if the animal has been habituated to eating only cooked food, a sudden change of food may affect the digestion. This system needs to be introduced gradually.

Proper diet charts need to be urgently formulated in collaboration with the Forest Department, researchers, veterinarians and NGOs, based on knowledge and expert scientific advice.

In most of the temples, water is scarce due to a lack of storage options and a lack of hygienic facilities.

Water should be provided within the housing complex. A 500 liter capacity water facility at least needs to be provided, which will enable the elephant to drink when it wants, without any restriction.

Temples need to provide potable drinking water from a river or another source of running water. A daily bath with clean water needs to be given to the elephant.

Special tanks where elephant could be made to lie down and washed should be made available; where ever possible lakes, channels, rivers should be accessible to the elephants; water also needs periodic checking for chemical or sewage contamination.

Work Conditions

Temple elephants are made to work in order to earn revenue for the temple and mahout. Coupled with lack of knowledge and absence of guidelines, these animals get abused routinely in terms of their working conditions. Blessing devotees, in some cases from 800–2000 times a day is a burden for the elephant on festival days. Work of such nature should not be entertained.

The elephant is made to stand in the temple premises for work such as blessing devotees and/ or begging from them. This is done with the elephant standing on hard floors, being given cooked food with restricted time to eat it. There is no scope for the animal to forage.

Physical exercise is often neglected and if the elephant is walked, it is on tarred roads/ hard surfaces. Walking on hard surfaces is not recommended because of the animals' special feet structure which predisposes it to joint problems. The animal putting a lot of effort or weight on the joints leads to joint inflammation, ankylosis and fusion of joints. Wear and tear of the soles which is not protected by a hard covering is more when it walks on hard floors.

While working, temple elephants are made to stand in one place for long hours without any provision for walking. Absence of exercise makes them obese, especially considering the varied cooked food provided by devotees/ visitors to elephants.

The temple environment should be psychologically stimulating for the elephant in tune with its biological needs. Exposure to mild work like carrying small logs is suggested which provides scope for exhibiting natural behaviour like play, wallowing in mud, dust bath or with other elephants and walking.

Cooked food should gradually be avoided with arrangements made to provide sufficient natural food instead. Also tree cover around the housing (natural vegetation) is recommended.

Among the types of work, the practice of blessing by the elephants should be treated as an offence

During festival seasons elephants are exposed to heat for long hours during the festival season.

The duration of certain parades and the timings is the reason for lack of appropriate physical and psychological exercise for the elephants. The animals are made to stand still for varying durations of the festival/ parade and on completion of one festival, are transported to the next festival/ parade for performance of similar activity.

Spacing of elephants within a given area during parades is neglected, resulting in increased number of elephants within a given space.. Ideally, a perimeter should be provided per elephant (of about 10 ft space between each elephant) so that the elephants do not get into fights regarding food or other reasons, during parades and processions.

Organizing or elephant booking for festivals is highly mismanaged by brokers and owners, i.e., brokers do not take the elephant's biological needs as well as the logistics of transport/travel into consideration while booking.

During the festival season, elephants do not receive sufficient fodder and water for drinking and bathing. Providing nutrition to elephants is a neglected area with no scientific basis for the current methods of feeding and food types provided.

Lack of sleep is cited by many mahouts as the reason for elephants supposedly becoming violent, more than any other factor. Elephants with a height of 8.45-9 ft are the most stressed out, with regards to sleep as they are more in demand for festivals, travel more and hence receive less sleep.

Transportation by lorries has not only proven dangerous (due to accidents) but causes them to attend more festivals within a short duration of time.

A lot of elephants in Kerala are *outsiders* (arriving from other states). These non-native elephants are immediately, after arrival into the state, pushed into the mainstream elephant culture with no appropriate training or conditioning period. Most of these elephants are not familiar with the language in which commands are given, are unused to the diet and also the festival culture. Hence, many of these elephants panic or become aggressive, out of confusion or uncertainty, during parades.

Musth is another factor, which according to experts, coincides with the festival season of Kerala, in most elephants.

Elephants with injuries, abscesses, foot problems, open wounds, etc., do not receive appropriate care, nor periods of rest to allow their wounds to heal.

Also elephants with painful conditions such as rheumatism, arthritis, bronchitis and other chronic medical conditions are rarely exempted from festivals. Though legally it is required that an elephant be physically fit to attend festivals and needs certification by qualified veterinarians, the same is not being practiced. Owners procure several fitness certificates for their elephants, weeks before the event.

Influx of untrained mahouts has also been one of the causes for elephant attacks and disasters.

Absence of an organized disaster management team in cases of elephant rampage

Currently certain youth groups during temple festival seasons in Kerala voluntarily formed a rescue team to control elephants that have gone amok. Though well meaning, they do not have the necessary knowledge regarding elephant psychology and biology and hence often make situations worse. In fact one of the team members was killed by an elephant during one such rescue attempt. It is possible to organize and train these groups.

Health Care

Veterinary care, when present, is aimed only towards treatment of specific medical conditions and emphasis is not placed on prevention or recurrence. Presence of veterinarians, though an important component in the management of elephants, should not be over-rated. It has been a consistent observation that even with the presence of many skilled veterinarians in Kerala, the condition of the elephants continues to deteriorate in an alarming way. Medical management is also focused more towards treatment rather than prevention.

Routine health check-up for temple elephants and mahouts needs to be made mandatory. In case the CWW gives permission for ownership of elephants to private individuals or temples, guidelines need to be formulated in advance with the medical team. This would ensure that check-ups are specific in nature and are not general clearances offered by the veterinarian as a routine procedure.

Before permission is granted for the keeping of elephants, the CWW should ascertain the availability of qualified and experienced veterinarians in the area, who would be responsible for the medical fitness of the animal.

Documentation of an elephant's health history should be made mandatory. Unnecessary deaths of captive elephants should be avoided at all costs.

Temples could be brought under two to three zones or circles and qualified veterinarians need to be appointed for each zone or circle. Providing training periodically to these doctors in forest camps and zoological gardens by experienced veterinarians should be made mandatory.

Permission-giving authority

Despite the reverence accorded to them, temple elephants are most abused, often due to ignorance and a lack of guidance from the concerned departments. Since the Chief Wildlife Warden (CWW) of a state is the permission-giving authority, it is strongly suggested that the department has an obligation to see that laws are followed strictly and the well-being of the animal is ensured.

A committee constituted by the CWWs of the states where elephants are kept in temple, should review all temples desirous of keeping elephants. The report should be submitted to the CWW before permission is granted for keeping elephants on their premises.

Periodic checks have to be made by the concerned department personnel and the veterinarian. In the absence of manpower and other resources, the CWW should not accord ownership certificates to temples desirous of keeping elephants. Majority of these temples have conditions rated as less than satisfactory for keeping captive elephants.

The term “upkeep, maintenance and housing” as stated in section 42 of the Wildlife Protection act, 1972 should be clearly defined for an elephant and standards of grading should be urgently initiated to prevent confusion amongst the inspecting personnel.

A handbook on elephant management should be created, with information on space requirements, water, nutrition and exercise requirements, information on mahout, etc. This should be easily available to all private owners and agencies.

The temple authorities often do not anticipate the effects of faulty management practices that can endanger the life of the mahout, the public and the elephants. The Forest Department should call for the assistance of experts, biologists, researchers and NGOs who should constitute a team to negotiate with the temple authorities. This will ensure that the temple authorities understand the problems and responsibilities that elephant-keeping entails.

On inspection of existing temple elephants, if norms for their maintenance fall below the required standards as defined by policy-makers, the temples should be persuaded to house them in a care center. The temple authorities should come forward to contribute towards the maintenance of the elephant.

Since elephants are subjected to high stress due to monotonous routines, a lack of interaction and being confined to small areas, the CWW should be very careful in awarding permission as per Section 42 of the Wildlife (Protection) Act 1972.

Temples should be persuaded to comply with the above recommendations on the basis that their elephants would be allowed to participate in certain seasonal temple rituals. However, the rituals should not compromise the welfare of the animal.

Keeping of elephants in temples and ensuring their welfare therein seems to be an uphill task. It is in the interest of the elephants and of the general public that no new elephants be brought under the management of temples. It would be best to phase out temple elephants over a designated period of time.

It is also important to debate upon and resolve the various ethical issues and socio-cultural practices associated with captive elephant keeping in temples.

Due to reasons that are unique to temples, two approaches could be adopted to address its captive elephant issues - The *in-situ* and *ex-situ* approaches.

The *in situ* approach

Rehabilitation or welfare measures adopted for the main stream elephant culture circuit with various stakeholders such as owners, mahouts, brokers, general public, festival committees, etc.

This could constitute welfare measures such as:

1. Providing regular health care services for elephants by organising health camps
2. Technical counsel for various management issues

3. Undertaking research on various aspects associated with elephant care: the concept of “care” may have different meanings depending on the stakeholder— with increased knowledge on the priorities of each management level, a suitable approach could be evolved to improve the welfare status of the elephant/s
4. Conducting workshops, discussions involving stakeholders such as owners, mahouts, and the State Forest department, temple committees etc, on associated issues of elephant management
5. Conducting training programmes for mahouts/owners, mahout welfare programmes, organising awareness programmes for the general public
6. Setting up an academy for elephant and mahout training
7. Monitoring movement of elephants across the state border, with inspection of elephants for their health, ability to understand commands in local language, particulars of itinerary
8. Maintaining a “blacklist” of habitual offenders regarding welfare of their elephants
9. In extreme cases, legal action could also be taken

The *ex situ* approach

The rigors of work or the absence of a natural environment brings forth the need for a place where such provisions can be made available. Often elephants may need to be permanently/temporarily isolated from the mainstream for a variety of reasons (poor health, age, temperament, adapting to a new mahout, etc.) and need to be provided special care at Rescue/Rehabilitation/Care centres (RRCs). This would constitute the ex-situ approach.

The concept of RRC centres must be re-defined depending on the states. As mentioned earlier, in some states, in particularly Kerala, where elephants are primarily used for temple festivals, the elephant owners have the potential to improve. If they are convinced of the integrity of a certain method, economics is not a constraint for most owners, in making changes in their management practices. But unfortunately Kerala does not have a readily available model for optimum elephant care which can be emulated by individuals or groups of owners. Even if one such model were to be developed, the owner community would be encouraged to adopt or simulate similar conditions themselves. At present, the focus seems to be on legal issues rather than improving the welfare of captive elephants in the state.

The objective of RRC Centres must not be to increase the number of elephants within the facility but on the other hand increase the number of owners to simulate similar conditions on their own property. However, in reality, there will most definitely be elephants that need temporary or permanent shelter within the facility. Confiscation should be the last option.

This strategy will have more acceptances among owners and they themselves might start seeking counsel voluntarily if it is shown to be successful in improving the objectives of all involved. Gradually, it is hoped that owners will establish a trend to accept and seek counsel from RRC centres.

Therefore, primarily it is essential to establish the concept of rehabilitation and care for elephants within the minds of the stakeholder community. It is here that the role of

RRC centres becomes significant. RRC centres can demonstrate to the elephant owner/lover community the emotional, economic and aesthetic value of restoring the physical and behavioural health of sick elephants. Keeping the above vision in mind, RRC centres could carry out the following functions, (minimizing economic loss to the owner and maximizing welfare status of the captive elephant/s):

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

Ideally, once a standard for optimal care is established and elephant stakeholders realise the significance of such a condition, the *insitu* and *exsitu* approaches must function in a cyclical manner. Gradually the need for RRC centers should cease. But then that is wishful thinking. As long as there are captive elephants, there will always be some amount of abuse and need for external intervention. But the philosophy or vision should be to aspire for such a situation.

Captivity for elephants need not be exclusive of all natural conditions: a state existing at present for them in the observed in temples. If temples have to cater to the welfare needs of their elephants, provision for the animals' interests should be paramount. This can be achieved by two ways:

1. putting an end to the practice of keeping elephants by temples keeping in view the long term effect of practice 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 owners with mandatory 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.
 - 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.

- Temples 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
- Formulation of policies/ monitoring/ providing recommendations on the captive situation for temple elephants needs to be streamlined to a single person or group of persons
- Establishment of mobile veterinary units to provide health care for temple elephants
- 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, festivals, 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 temples/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.

- Provision of a more natural environment in terms of physical living conditions
- Work performed needs to be oriented toward elephant's natural behaviour, lesser duration of work specifically for TrvBeg elephants, provision of shade/ water/ food/rest while working, maintenance of howdah, other equipment, borne by the elephant
- Feeding opportunities to be provided by allowing free-ranging in areas with diverse vegetation
- Group structure needs to be maintained without restraining the animals
- Musth handling, specially for temple elephants, needs to be altered by looking at options such as provision of space to roam free in enclosed area, availability of elephants of opposite sex
- Veterinary care needs to be improved, records have to be maintained

Despite the complex issues prevailing in some of the states temple elephants are found and used for festivals, there is one vital factor which is most significant and favorable for future welfare activities. There is a desire within a certain section of the owner/mahout community and the general public, to improve the existing situation. Therefore, if the various welfare agencies work in a coordinated manner, along with

mounting social pressure, the stakeholders of elephant culture will be forced to improve.

However, for this, the primary requirement is for the various welfare oriented agencies and government departments, to cast their differences aside, and work together for a common goal to develop a realistic policy for addressing the needs and issues of elephant festival culture, which has reached crisis proportions.

Areas of elephant management and welfare requiring research

1. Developing alternate, economic sources of fodder and possibility of introducing a mixed diet and varieties of food items; disposal of fodder waste and dung
2. Resolving the water scarcity for elephants based in urban areas
3. Developing an optimum and regional model for elephant care
4. Developing elephant-friendly sources of employment
5. Addressing the psychological needs of Kerala's tuskiers (How best to provide them a social life), management of musth
6. Developing the best training and handling methods (Relevance of the traditional systems of training and handling in the present socio-cultural climate)
7. Using elephants at festivals
8. Climate of the festivals
9. Numbers of elephants at festivals
10. Using female elephants for festivals
11. Defining genuine elephant welfare
12. socio-economics of elephant keeping
13. welfare management of mahouts/ cawadies

Introduction

Among different owners of captive elephants in India, temples play an important role in maintaining elephants. It is hypothesized that elephant keeping methods were absorbed into Aryan culture as they subjugated civilizations in the Indus valley region. With passing centuries, the importance of elephants increased until mythology around elephants was introduced and the elephants' place in temples increased (Lahiri-Choudhury, 1995). Sanderson (1879) writes about the importance placed by local communities on the morphological features of elephants for use in temples. The management regime employed by temple authorities decide the captive conditions for its elephants—a feature that may/may not be suitable for elephant life.

Objective

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

- Develop a profile of welfare status of temple elephants in terms of physical and biological features provided in captivity
- 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. This 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.





c



d



e



f

Figures 1a, b, c, d, e and f: Data collection from different temples across different states, direct observation (a) body measurement (b), measurement of dung pile (c) weighing dung pile (d), interviews with temple administrations (e) interviews with elephant handlers (f)

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

A total of 267 elephants belonging to five states and 112 temples were observed (Table 1) for population demography data. Of this, the age of two males and 11 females was not known.

Table 1: State-wise distribution of temple elephants

S. No	State	Number of elephants studied
1	Andhra Pradesh	2
2	Karnataka	32
3	Kerala	161
4	Maharashtra	5
5	Tamil Nadu	67
	Total	267

Figure 2 gives age and sex based distribution of elephants among the temples observed. Maximum number was accounted for by adult males (16-40y; 35% of a total of 267). The same age group among females accounted for 18% of the total population. Older males (41-60y) accounted for 18% and the same age-group among females contributed 10% to the total. Sub-adult males and females occurred in equal numbers (8% each). It should be noted that temple elephants from Kerala contributed 62% of the total population ($n=280$). There were no calves/ juveniles among male/female elephants. The ratio of male: female was 1:1 for sub-adults, falling to 1:0.52 (16-40y), 1: 0.56 (41-60y) and 1: 0.4 (>60y).

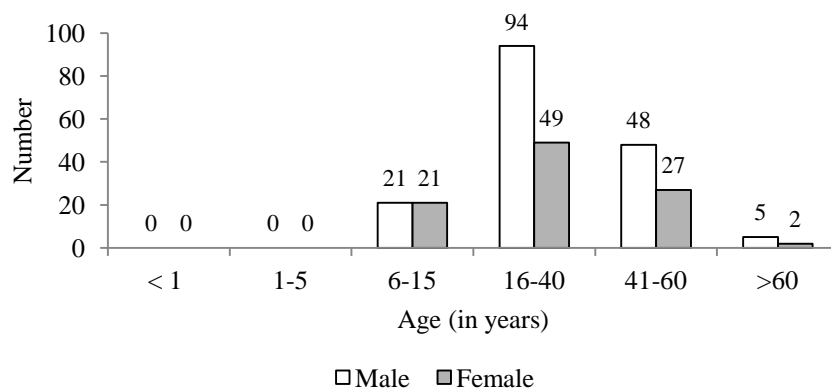


Figure 3: Age distribution of observed temple elephants

Welfare status of elephants

Information on elephants belonging to 84 temples, across five states, was collected for their welfare status.

Source

Mean Rating (MR) for source (in terms of acquisition of elephants) was 1.5 as compared to an Expert Rating (ER) of 6.0 showing a deviation of 75% from prescribed norms. All female elephants (n=75) of temples had been purchased/donated. Similar was the situation for all male elephants (n= 84), except one which had been rescued in 1936.

Shelter

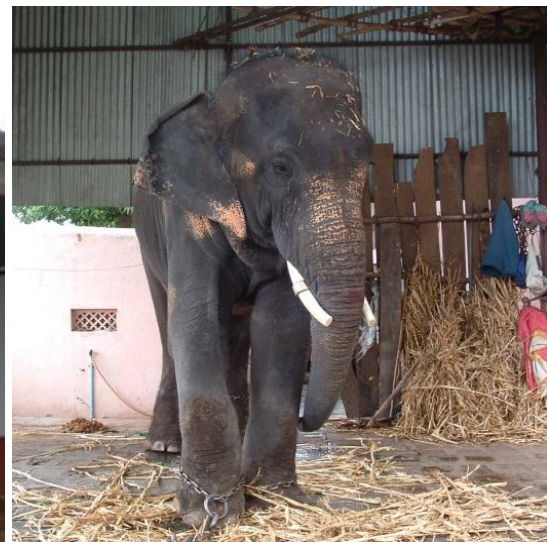
Provision of natural physical features such as vegetation, soil/sand as substrate opportunity to choose shade/sunlight will assist in maintaining both physical and psychological health of elephants. Exposure to hard substrates has been associated with foot problems (Benz, 2005).

Prevailing shelter conditions (Figures 4a, b, c, d, e, f, g, h, i and j)

- of 143 elephants, 53% were confined in open space with no shelter; 34% had access to closed type shelter (with roof)



a



b



c



d

- 81% (n= 145) were exposed to hard substrates (concrete/stone)



e



f



g



h



i



j

Figures 4a, b, c, d, e, f and g : Shelter provided for captive elephants in different temples across India, closed shelters (a and b) open shelters (c and d) different types of floors (e, f, g and h) shelter hygiene observed (I and j)

MR was 3.3 (SE= 0.3, n*= 5) with a deviation of 59% from ER.

Water

Depending on its availability, wild elephants consume water at least once a day (Sukumar, 1991). In captivity, this opportunity is restricted by source of water (taps, tanks, wells) as well restriction on movement. Water source that is stagnant may lead to contamination. In the absence of the elephants' opportunity to bathe/wallow, healthy skin condition can be maintained by bathing of the animals by handlers.

Prevailing conditions

- Fifty five percentages of elephants (of a total of 155 elephants) had access to a combination of rivers along with other sources—pond/lake/tap/tank/well
- Only 14% (n= 146) were bathed in rivers or streams.
- Unsuitable scrubs such as stone/ brush/ soap were used for 83% (n= 143)



Figures 5a, b, c and d: Scope for water for elephants kept under different temples, water provided through hose pipes for both drinking and bathing (a and b), pond as source (c and d)

MR was 3.7 (SE= 0.3, $n^*= 5$) indicating a deviation of 54% from ER.

Walk

Wild elephants traverse vast distances as they forage and engage in species-specific activities (Poole and Granli, 2009). All related aspects such as exercise and

psychological stimulation are interlinked with this activity. In captivity, both opportunities to walk as well its duration are controlled by people.

Prevailing conditions:

- Of 133 elephants, 74% were given opportunity to walk
- Nature of terrain varied— roads (tarred/ mud), crop fields, forest areas
- Mean distance covered was 7km/day (SE= 0.8, n= 79) in a duration of 3.4hrs (SE= 0.3, n= 72)

MR was 4.3 (SE= 0.3, n*= 5) implying a deviation of 52% from ER.

Social interaction

Wild elephants have been observed in groups of various sizes, interaction of different types and ways has been documented among elephants (Vidya and Sukumar, 2005). Opportunity for interaction maybe restricted or absent for captive elephants.

Prevailing conditions:

- Eighty two percentages (n= 129) of elephants were allowed interaction with other elephants
- Mean interaction duration was 5.4hrs (SE= 0.6, n= 96)
- Mean group size was 5.0 (SE= 1.0, n= 35)



a



b



c



d



e



f

Figures 6a, b, c, d e and f: Scope for among elephants kept under different temples, only mahout is source of interactions in a temple (a) kept alone (b, c and d), tied alone but next to another elephant (e) among other elephants in a festivals (f)

MR was 2.4 (SE= 1.2, $n^*= 5$) with a deviation of 70% from ER.

Chaining

Use of chains can not only restrict movement but also affect ability to express species typical behaviours.

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

- Only 6% ($n= 144$) elephants were allowed to range-free as well as chained; the rest were not allowed to range-free
- Fifty six percentages ($n= 109$) of elephants were chained using spikes or were hobbled by their fore-legs
- Mean chaining duration was 17.5hrs (SE= 0.4, $n= 126$)



a



b



c



d



e



f

Figures 7a, b, c, d, e and f: Types of chained used for elephants kept under different temples

MR was 0.3 (SE= 0.3, $n^*= 5$) with a deviation of 96% from ER.

Observed behavior

Perceived temperament of an elephant as “quiet” may not imply that the animal has not attacked people or shown aggression. In addition, pliant behaviour of elephants maybe achieved by use of negative reinforcement, leading to stress / physical injury among the animals. Occurrence of stereotypy, under observed conditions of ontogeny of such behaviour and poor captive environments, have been linked to poor welfare (Mason, 2006)

Prevailing conditions

- 69% of the observed 98 elephants were described as quiet/calm; 29% as quiet and/or aggressive/ agitated/nervous/undependable
- Incidents of killing/injury by elephants was reported for 14% of the observed elephants ($n=44$)
- 62% ($n= 66$) exhibited symptoms of stereotypy

MR was 4.5 (SE= 0.5, $n^*= 5$) indicating a deviation of 44% from ER.

Work

An association exists between work performed by captive elephants and the reason for its continued maintenance. Welfare, in terms of ability to perform species-typical behaviours, can be poor depending on the work type performed.

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

- Ninety six percentages of the elephants (n= 135) were used for work
- Work type involved various activities: Merely standing in front of temple, taking part in temple rituals/processions/ blessing public



a



b



c



d



e



f



g



h

Figures 8a, b, c, d, e, f, g and h: Work types exposures to the elephants kept under temple regime, blessing devotees (a, b a and c) attending temple procession (d), made to stand near market to bless people (e), attending temple festivals (f and g) transported to attend temple festivals (h)

- Mean work duration was 6.2hrs (SE= 0.3, n= 112)

MR was 2.4 (SE= 0.9, n*= 5) showing a deviation of 70% from ER.

Food

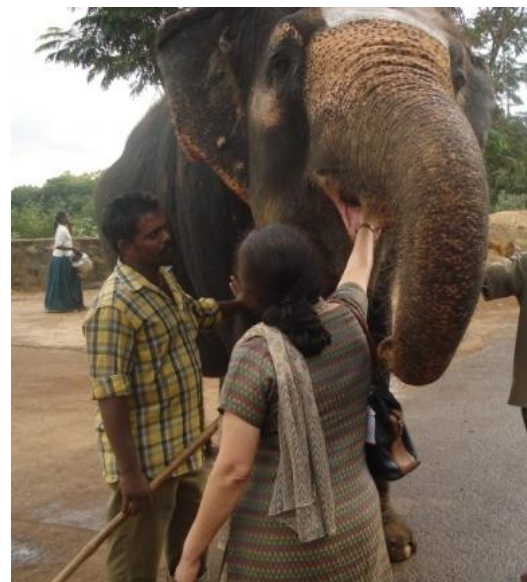
The wide range foods eaten in the wild (Sukumar, 1991) cannot be replicated in captivity, more so, when given only stall feed.

Prevailing conditions (Figures 9a, b, c, d, e and f)

- Only 5% (n= 149) elephants were allowed to forage as well as given stall feed
- Stall feed types were: Boiled rice, flat rice, pepper, salt, ginglee oil, turmeric, Rice, Ragi, salt, Sugar, Mineral Mixture, Horsegram, green gram, coconut, Normal grass, Green fodder, Sugarcane, Fruits & vegetables, jowar, jaggery; depending on the temple, several combinations of these items were given



a



b



c



d



e



f

Figures 9a, b, c, d, e and f: Food provided to elephant kept under temples; primarily stall fed, and food offered by devotees; chained no physical activity possible even while feeding

MR was 2.2 (SE= 1.0, $n^*= 5$) with a deviation of 76% from ER.

Reproductive status

Absence of species-specific expression of reproductive behaviour among captive elephants maybe due to absence of individuals of opposite sex/ pathological/ caused by husbandry regimes/ stress induced (Clubb and Mason, 2002).

Prevailing conditions (Figures 10a and b)

- Occurrence of oestrus was reported among 38% females ($n= 29$)
- Only 15% ($n= 26$) were exposed to males
- Of 26 females (considering data on observed mating/calf-birth) only five had given birth
- Reproductively active of exhibition of musth was observed among 52% males ($n= 31$)
- All elephants in musth were isolated/chained

MR was 1.6 (SE= 0.5, n*= 5) indicating a deviation of 80% from ER. MR refers to reproductive status considering both males and females together.



a



b

Figures 10 and b: reproductive status of elephant kept under temples; adult female (a) and male (b); kept alone without any scope for exposure among them; this is common in many temples

Health status and veterinary facilities

Imposition of human control on many aspects of elephants' life may engender the animals' health through improper management and or absence of veterinary care.

Prevailing conditions (Figures 11a , b, c, d, e and f)

- Of 46 instances of presence of disease/injury, 46% was accounted by foot/leg problems, 30% due to GI tract issues/presence of worms/respiratory problems, eye problems 13% and abscesses 11%
- Seventy two percentages (N=75) of elephants had been dewormed, 41% immunized (n= 79) and sample tests of dung/urine/blood was done for 7% (n=29)
- Fifty six percentages (n= 113) of veterinary doctors visited their elephant/s daily, 43% were on call/ visited monthly



a



b



c



d



e



f

Figures 11a, b, c, d, e and f: health issues reported and veterinary care available for elephants in temples, foot problems frequency health issues (a, b, c and d), veterinary doctor (e) and a mahout attending health issues (e and f)

MR was 3.8 (SE= 1.0, n*= 5) showing a deviation of 53% from ER.

Overall welfare rating for temple elephants (MR, considering all parameters together) was 2.8 (SE= 0.4, n[†]= 10) showing a deviation of 64% from ER. Considering the deviations for each of the parameters observed, nine of the ten parameters showed deviation of 50% or more from ER, implying divergence to this extent from norms prescribed by the expert team.

Mahout (cawadi) professional experience and socio-economic status

In the Indian context, mahout/cawadis form an integral part of elephants' life. Hence, their professional experience and socio-economic status was considered.

Professional experience (Figures 12a, b, c, d, e and f)

Inexperienced handlers may not only cause stress to the elephant, but also cause injury to him/herself and the animal.

Prevailing conditions

- Mean age of handlers was 38.5yrs (SE= 1.4, n= 71)

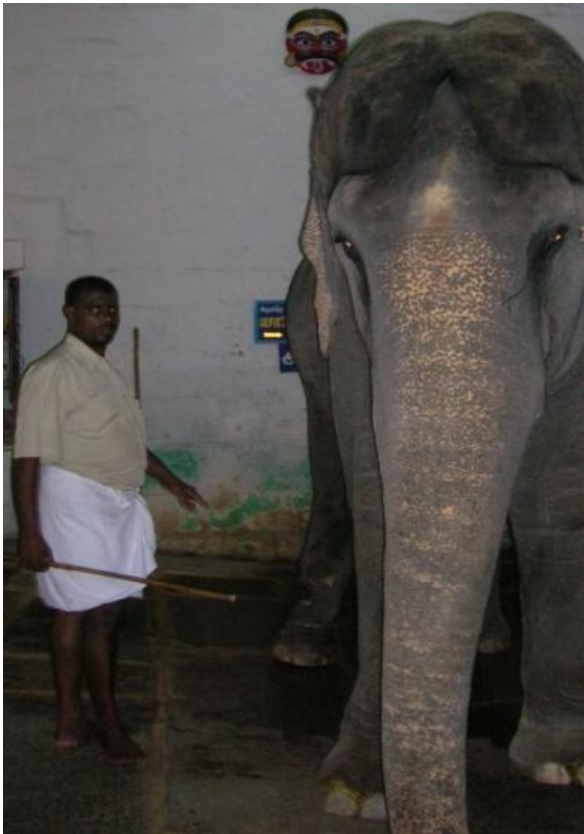
- Mean experience in this profession was 15.2yrs (SE= 0.8, n= 163)
- Mean experience with most recent elephant was 11.4yrs (SE= 1.0, n= 79)



a



b



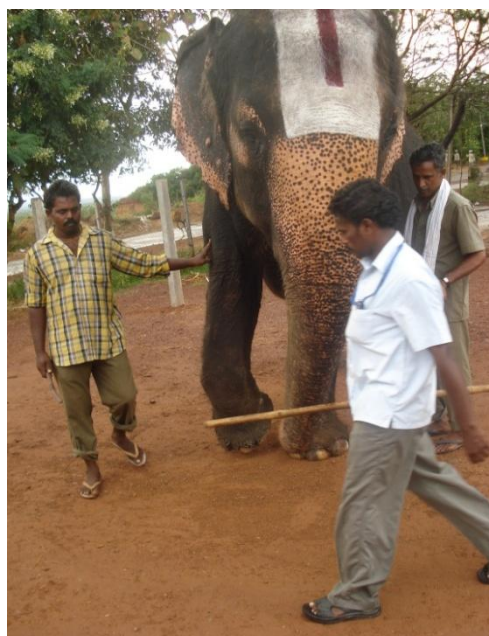
c



d



e



f

Figures 12a, b, d, d, e and f: Mahouts' profile, family and work responsibilities, a group of mahouts (a), mahout family (b), mahouts with their respective elephants (c, d, e and f)

MR was 5.7 (SE= 0.7, $n^*= 4$) showing a deviation of 37% from ER.

Socio-economic status:

Poor economic status of handlers may lead to conflict of interest between the elephants' welfare and the need to earn. Social habits such as alcohol consumption also play a part in the way elephants are handled.

Prevailing conditions:

- Mean annual salary was Rs.30,055/- (SE= 1941, $n= 87$)
- Insurance cover was available for 81% ($n= 173$) of handlers
- Fifty six percentages ($n= 117$) of mahout reported alcohol consumption

MR was 4.8 (SE= 0.4, $n^*= 4$) with a deviation of 40% from ER.

Discussion

Absence of features suitable to captive elephants for nine of the ten observed parameters indicates the extent of divergence from natural conditions in temples. Expression of species-typical behaviours can be curtailed in many ways: by chaining, providing a physical environment made of man-made structures, social isolation, restrictions on natural behavioral expression by performance of human tutored and controlled behaviours. In temples, various combinations of all these aspects could be observed. This was in contrast to the less than 50% deviation observed for handlers' professional experience and socio-economic status.

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Section 2:
Captive elephants in Temples of Andhra Pradesh

Executive summary

A temple in Hyderabad in the state of Andhra Pradesh has been maintaining a female elephant, named Gajalakshmi (aged 22 yrs.), used in temple related functions. This investigation assesses the welfare status of the elephant and its condition in captivity based on the physical, social and behavioral conditions as well as the health status of the elephant.

The captive environment has been studied using physical aspects such as provision of shelter, floor type, etc., behavioural features such as the animal's temperament, incidents of aggression and social characteristics such as opportunity for interaction with other elephants, etc. A total of 53 sub-parameters were observed and rated and each of the parameters has been rated on a zero to ten scale with zero representing the worst possible situation and ten implying a satisfactory state, closer to what an animal experiences in the wild.

Rating was graded in the following manner:

- 0 – 2.4: Bad conditions
- 2.5 – 4.9: poor
- 5.0 – 7.4: moderate
- 7.5 – 10.0: satisfactory

Gajalaxmi is kept in a closed enclosure that is 500 square yards in area (~418 square metres). The enclosure is open with a boundary wall, the floor is earthen. Additionally, there is a single tree present, which provides some shade during the day.

Overall mean for shelter for this elephant was 4.2 with four sub-parameters getting a rating of less than three. Tap water and a borewell located 100 m away were the source of water.

Gajalaxmi is allowed to drink tap water three times a day; she is bathed using borewell water once a day, and twice a day during summer. Bathing place size was 25 sq. Overall rating was 6.0 with three sub-parameters getting a rating of less than five.

No interaction is possible as the elephant is kept singly. Elephants are social animals with group living forming the basis of a female animal's life, overall rating for physical exercise and social interaction was only 1.7 with five sub-parameters getting a rating of zero.

The animal is tied with a 25 m long, and one front leg and one back leg are chained. Mean rating for chaining related parameter was 0.0 showing occurrence of bad welfare conditions.

Gajalaxmi takes part in temple processions eight days in a month. This involves walking a maximum of 12 km along roads without shade, carrying a maximum weight of 500 kg, or else she drags a maximum weight of 250 kg for 2-3 km. Overall mean rating was 5.7 showing moderate working conditions.

Only stall feed provided, no free-range, the food type includes grass-50 bundles, kadbi-20 kg, Jawar-10 kgs, Rice-25 kg, Leaves-50 kg, and banyan leaves-10 kg. She also receives jaggery and coconut during processions. Overall rating for food related parameter was 0.8 indicating occurrence of bad conditions.

Reproductively not active, not exposed to males, kept singly. Overall mean rating was 0.0 showing absence of normal reproductive functions.

No clinical/ service/ other records are maintained for the animal, skin condition is very dry; Deworming done with Ayurvedic medicine. Overall rating was 2.5 implying occurrence of bad conditions. No doctor is present at the location; however a veterinary doctor from Karnataka treats the elephant once a month. Overall rating was 0.8 indicating bad conditions for this parameter.

Overall mean rating for the elephant Gajalakshmi was 3.3 implying occurrence of poor conditions in captivity. Sixty-two percent of all the ratings were below five, while fifty-two percent of the parameters and sub parameters were given a rating of zero indicating complete absence of a feature suitable for the animal.

Introduction

Elephants have been maintained in captivity for different reasons: as part of a long-established tradition, as a status symbol, as a working animal, etc. It is believed that the practice of keeping elephants in temples is a relic of the practice of keeping war elephants during peace time (Ghosh, 2005). A temple in Hyderabad in the state of Andhra Pradesh has been maintaining a female elephant, named Gajalakshmi (aged 22 yrs.), used in temple related functions.

Objective

- To assess the welfare status of the elephants and its conditions in captivity based on the physical, social and behavioral conditions as well as the health status of the elephant.
- To assess welfare of the animal handler (mahout), if any.

Method

The life of wild elephants is shaped by the interconnecting factors of their habitat and their social environment. This complex set of features may be absent in captive situations. Elephants kept in captivity have to be provided a suitable environment, based on knowledge gained from wild free-ranging elephants, which provides for expression of species-specific repertoire of behaviours and well-being of the animals (Stroud, in press). A total of 53 sub-parameters were observed and rated. The captive environment has been studied using physical aspects such as provision of shelter, floor type, etc., behavioural features such as the animal's temperament, incidents of aggression, social characteristics such as opportunity for interaction with other elephants, etc. Each of these features has been rated on a zero to ten scale with zero representing the worst possible situation and ten implying a satisfactory state, closer to what an animal experiences in the wild.

Rating was graded in the following manner:

- 0 – 2.4: Bad conditions
- 2.5 – 4.9: poor
- 5.0 – 7.4: moderate
- 7.5 – 10.0: satisfactory

Each of these features is considered to be a sub-parameter. Some of these features have been grouped together to form a parameter. For example: shelter includes sub-parameters such as: shelter type, flooring type, maintenance of hygiene and shade availability. The ratings of sub-parameters have been used to calculate a mean rating for the parameter. The same rating scale has been used for assessing conditions exclusive to captivity such as availability of veterinary care, veterinary practices followed and facilities provided. Results depicting percentage occurrence of rating, from zero to ten, for a parameter or sub-parameter have been presented. The welfare status of the mahout has been rated on the same scale. The Mahout's socio-economic condition as well as his relationship with elephants has been assessed.

Result

Population status and the source of animal

Gajalaxmi is a 22 year old female elephant who is maintained in a temple (of Veeratapaswi Veerabhadra Shivcharyula), located in Hoontwadi, Jumerat Bazar Road, Chudi Bazar, Hyderabad. The elephant is reported to belong to Patel & Sons

Company. The animal has been kept for use in temple related activities and processions. It was transferred from its previous location in the neighbouring state of Karnataka in 2000, when the animal was 16 yrs. old.

Shelter

- Gajalaxmi is kept in a closed enclosure that is 500 square yards in area (~418 square metres).
- The enclosure is open with a boundary wall, the floor is earthen. It is cleaned twice a day with spade/ shovel. Additionally, there is a single tree present, which provides some shade during the day.

Overall mean for shelter parameter for this elephant was 4.2 (SE = 1.9, N= 6) with four sub-parameters getting a rating of less than three. The overall mean implies occurrence of poor conditions. The occurrence of natural forest conditions is considered while rating this sub-parameter. The greater the deviation from this condition, the lesser the rating. Rating was 2.5 for shelter type, showing existence of poor conditions. Considering the distance traveled by wild elephants, any area less than 1 acre (around 5000 sq.m) is given low rating. Rating was 0.0 indicating bad conditions for this sub-parameter. Natural/ earthen floors have been given high rating as they are suitable for maintaining health of the elephant's feet. Rating was 10.0 for this feature (Figure 1).

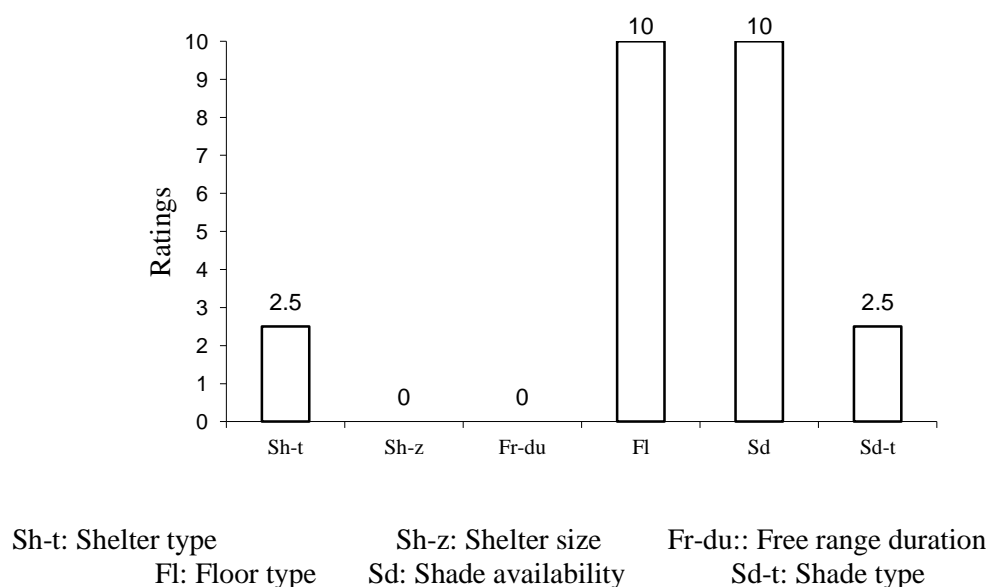


Figure 1: Rating for shelter related parameters

Water for Drinking and Bathing

- Tap water and a borewell located 100 m away were the source of water.
- Gajalaxmi is allowed to drink tap water three times a day, consuming approximately 280 litres of water. The water quality is good.
- She is bathed using borewell water once a day, and twice a day during summer. Bathing place size was 25 sq.m.

Wild elephants are reported to bathe (McKay, 1973), and drink water at least once a day (Shoshani and Eisenberg, 1982). Rating for this parameter was based on

availability, use, accessibility of water for drinking/ bathing and methods of use. Overall rating was 6.0 (SE = 1.2, N= 6) with three sub-parameters getting a rating of less than five. Running water is considered a good source as it is relatively free from contamination. Rating for this was 4.0 showing occurrence of poor sources as the elephant was said to be provided water through taps/ borewells— both these sources are not accessible to the elephant when it needs to drink/ bathe.

Provision of suitable environment which provides enough space for an elephant to immerse itself or perform species-specific activity is given high rating. Rating was 4.0 for this feature. Elephants take in water by their trunks. If mahouts observe this behaviour and the frequency of drinking is noted, the quantity of water consumed can be estimated. Rating was high when the number of times an elephant drinks implies consumption of 250 – 300 lts./day. Rating was 5.0 for this sub-parameter (Figure 2).

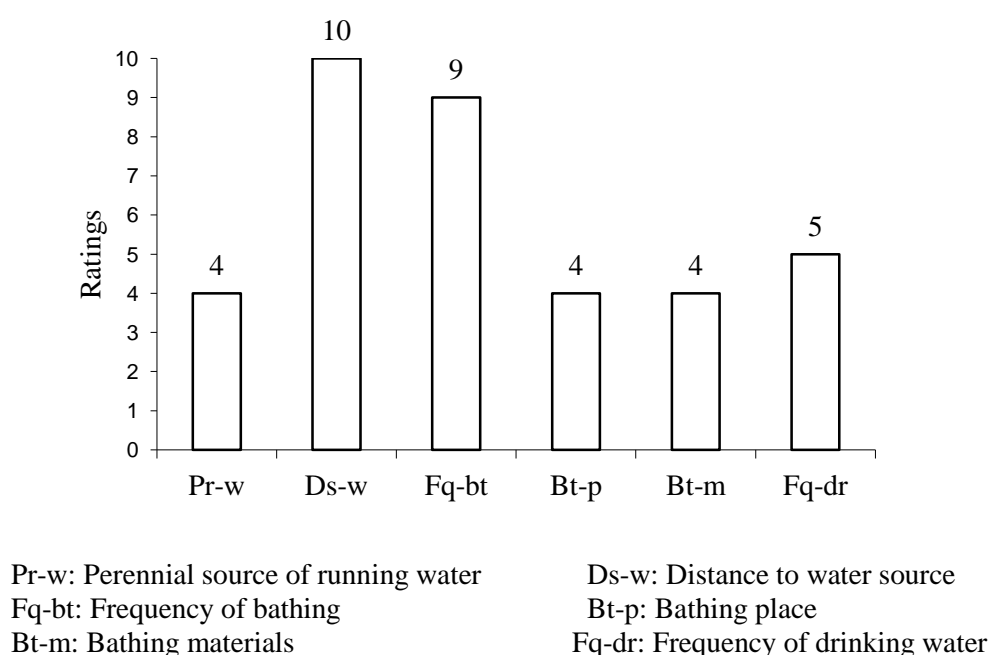
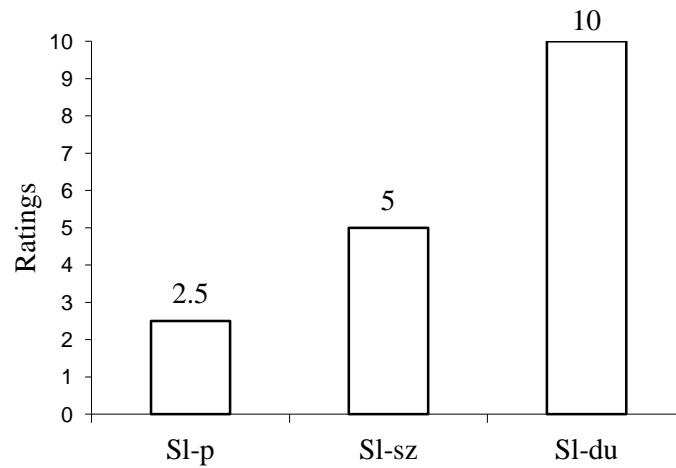


Figure 2: Rating for water related parameters

Sleeping Conditions

- Resting and sleeping place were the enclosure itself
- Area was 125 sq.m

Elephants have been reported to sleep around 4 hours (Zepelin, et al., 2005). Deviation from this norm is given low rating. Mean rating (Figure 3) was 1.76 (SE = 2.5, N= 3) showing occurrence of bad conditions. This parameter was rated considering suitability of place of sleep and duration of sleep.



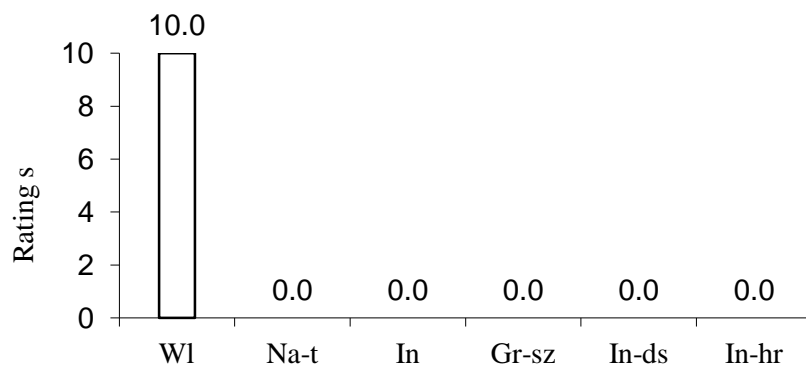
Sl-p: Sleeping place Sl-sz: Sleeping area (size)
Sl-du: Sleep duration

Figure 3: Rating for sleep sub-parameters

Physical Exercise and Social Interaction

- Accompanied on a 2 km, 2 hour walk by two mahouts.
- Nature of terrain: roads
- No shade available
- No interaction is possible as the elephant is kept singly

Benz (2005) cites several authors reporting the association between foot problems and lack of exercise or exercise on hard surfaces. High rating was given for opportunity to walk and walking on natural substrates. Elephants are social animals with group living forming the basis of a female elephants life (Lee and Moss, 2008). High rating for the “social interaction” parameter represents occurrence of similar herd structure in near natural conditions, both physical and social. Overall rating for physical exercise and social interaction was only 1.7 (SE = 1.8, N = 6) with five sub-parameters getting a rating of zero (Figure 4).



Wl: Opportunity for walk Na-t: Nature of terrain
In: Opportunity for social interaction Gr-sz: Group size
In-ds: Interaction distance In-hr: Interaction hours

Figure 4: Rating for physical exercise and social interaction related parameters

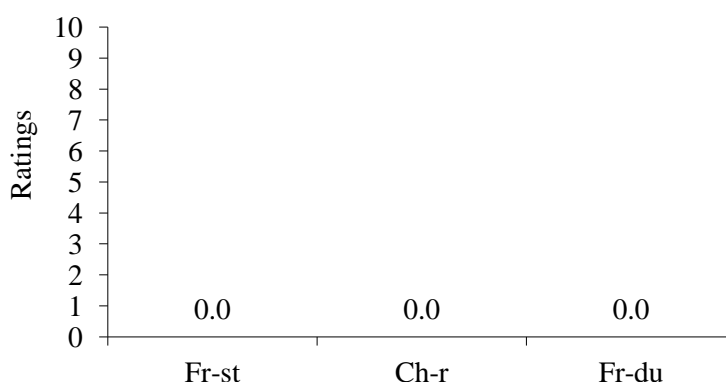
The elephant was said to be allowed to walk. Hence, a rating of 10 was given. The elephant was walked on tarred roads which are considered unsuitable for the animal's feet. Rating was zero for this feature.

The elephant was maintained singly, hence, there was no opportunity for interaction. Rating was zero for this feature. Sub-parameters for 'interaction' were all given a rating of zero as the elephant was kept singly.

Chaining

- Tied with a 25 m long chain, weighing 35 kg and size of 8cms (width).
- Front leg and one back leg chained
- No free ranging allowed
- Distance to work place from place of being chained was 80 m

Improper use of and long duration of chaining is said to have adverse consequences on the welfare of the animal (Kurt and Garai, 2007). Mean rating was 0.0 (SE = 0.0, N = 3) showing occurrence of bad welfare conditions (Figure 5).



Fr-st: Free-ranging status Ch-r: Chaining region
Fr-du: Free-ranging duration

Figure 5: Rating for chaining sub-parameters

The elephant, Gajalakshmi, was not allowed to free ranging and was chained all the time except for work. She was said to be chained in the fore and hind leg. Ratings reflect this condition.

Observed behaviour

- Gajalakshmi was described by her keepers as quiet but undependable, no reports of hurting anyone or having shown stereotypic behaviours.
- One situation in which she showed aggression— after a horse fell on her during the festival of Mohharrum.

Imposition of restrictions on movement and alien conditions, in captivity, could have consequences on behaviour (Clubb and Mason, 2002). Overall rating was 8.8 (SE = 1.4, N= 4) implying manageable temperament and absence of stereotypy (Figure 6).

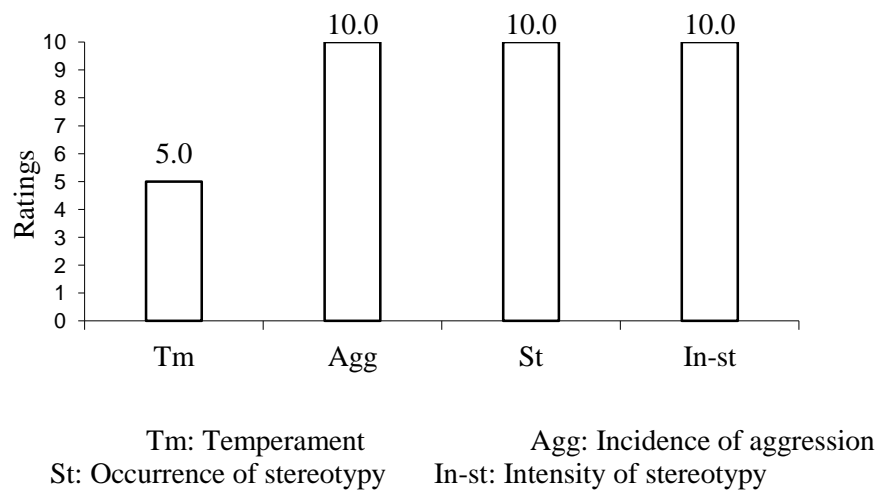


Figure 6: Rating for behaviour related parameters

Behaviour sub-parameters: Aggression/ stereotypy sub parameters were given a rating of 10.0 as incidents of aggression/ occurrence of stereotypy was absent. However, the animal's temperament was described as undependable.

Work

- Gajalaxmi is said to take part in temple processions eight days a month. This involves walking a maximum of 12 km along roads without shade.
- Carries a maximum weight of 500 kg during these processions for a distance of 12 kms, or else drags a maximum weight of 250 kg for 2-3 kms.
- Age when the elephant began working—10 yrs.
- Is said to take part in more than 50 festivals that pay more than Rs.5000/- per month.
- Has a wooden Howdah weighing 60 kgs. No lubricant is applied
- Water and rest provided during work
- Food given during work: Coconut-5 to 10, Banana-2 bunch, Leaves-sufficient

Captive elephants are made to work in different contexts. High rating represents characteristics of work that is similar to the animal's natural behaviour. Overall mean rating was 5.7 (SE= 2.2, N = 7) showing moderate working conditions (Figure 7).

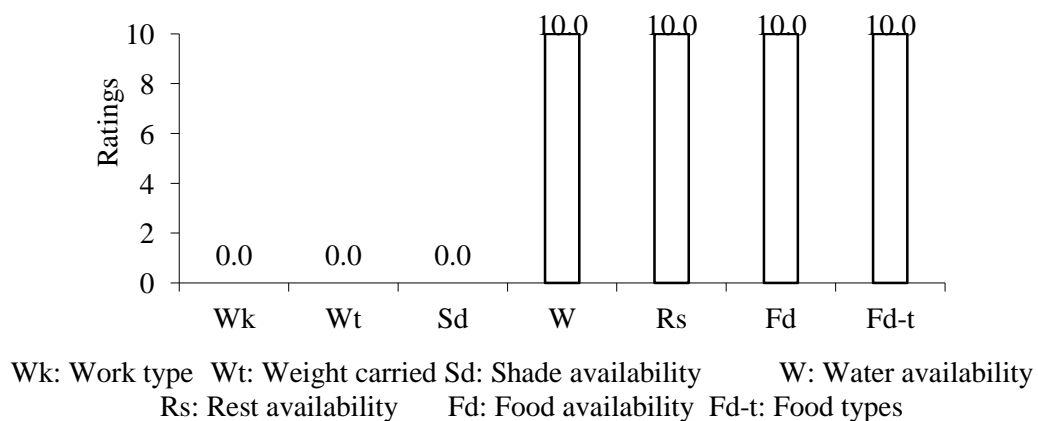


Figure 7: Rating for work related parameters

Low rating is designed to show the unnatural work type the animal is made to perform. The elephant was said to take part in processions and festivals (numbering more than 50). Rating was 0.0 for this feature. The size of the elephant may predispose people to subject the animal to heavy loads. Such loads may have to be borne consistently during the duration of work which may last the elephant's lifetime. Hence, low ratings reflect loading of the animal with heavy weights persistently. Rating for this feature was 0.0. The elephant was said to be provided with water during work. This was given a rating of 10.0; however, there was no data on the details of source/ accessibility to the animal.

Food

- Only stall feed provided, no free-range
- Food includes Grass-50 bundles, kadbi-20 kg, Jawar-10 kgs, Rice-25 kg, Leaves-50 kg, and banyan leaves-10 kg. She also receives jaggery and coconut during processions.
- Feeding area size: 83 sq.m, hygiene maintenance: bad
- Feeding hours: 24 h.

Wild elephants have been observed to feed on a variety of plants (Shoshani and Eisenberg, 1982). Food provisioning in captivity may lack the variety and behaviors involved during feeding as seen in the wild. Overall rating was 0.8 (SE = 0.9, N= 5) indicating occurrence of bad conditions.

Low rating shows use of only stall feed for the animal. Rating was 0.0 for this feature. Rating was designed to reflect a combination of free-ranging food and stall feed. Rating was 4.0 for this feature indicating bad conditions. Maintaining a ration chart for the animal assists in keeping a record of the diet pattern of the animal as well as inventory of provisions. Rating for this feature was 0.0 (Figure 8)

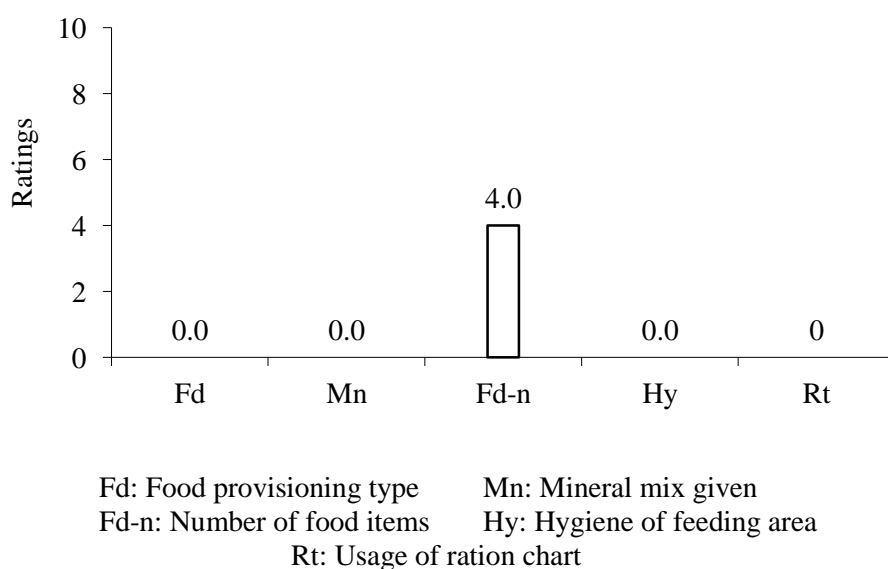


Figure 8: Rating for food related parameters

Reproductive status

- Reproductively not active, not exposed to males, kept singly

Physical fitness (Kurt and Garai, 2007) and/ or stress (harsh handling, poor nutrition, isolation) (Clubb and Mason, 2002) has linked to normal reproductive functioning in captive elephants. Overall mean rating was 0.0 (SE = 0.0, N= 3) showing absence of normal reproductive functions. The elephant had no opportunity to breed as it was maintained singly and not exposed to males. Rating was 0.0 for this feature and sub parameters as the elephant was not exposed to males, (Figure 9).

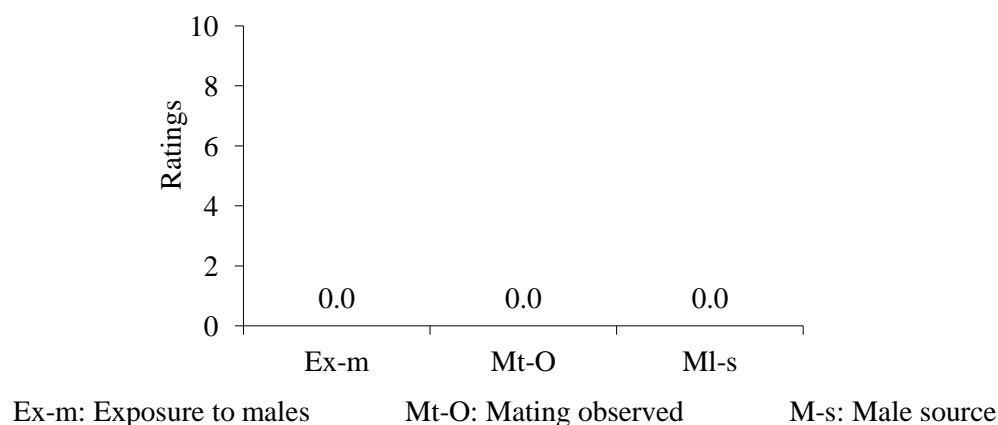


Figure 9: Rating for reproductive status sub-parameters

Health status

- No clinical/ service/ other records maintained
- Skin: dry; Elasticity of skin: slow
- Deworming done with Ayurvedic medicine
- No vaccination/ oiling of the body
- No tests of blood/ dung/ urine samples

Practices followed to maintain health among captive elephants can be considered an indication of welfare of the animal as such routines can be preventive and help in keeping the animal in good health. Overall rating was 2.5 (SE = 2.9, N = 4) implying occurrence of bad conditions. Captive elephants are exposed to a number of domestic animals, making them susceptible to diseases carried by these animals. Hence, vaccination status has been rated. This was given a rating of 0.0 as there was no record of vaccination. Tests on samples from the animal can assist in providing an insight to the presence of endoparasites, biochemical parameters and health of the animal. Rating was 0.0 as this was not done (Figure 10).

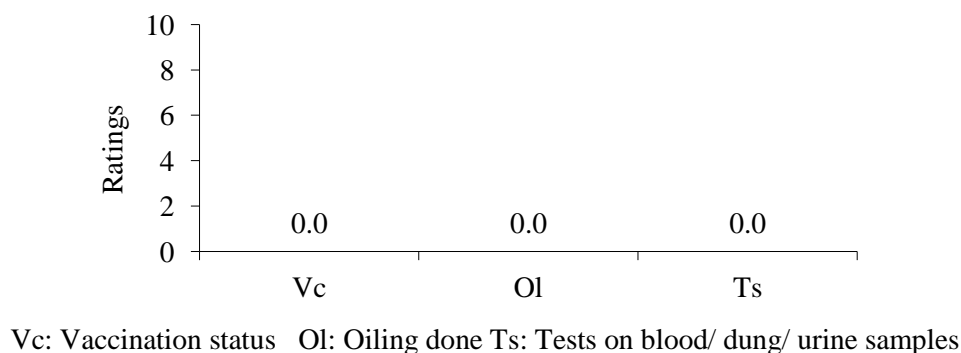


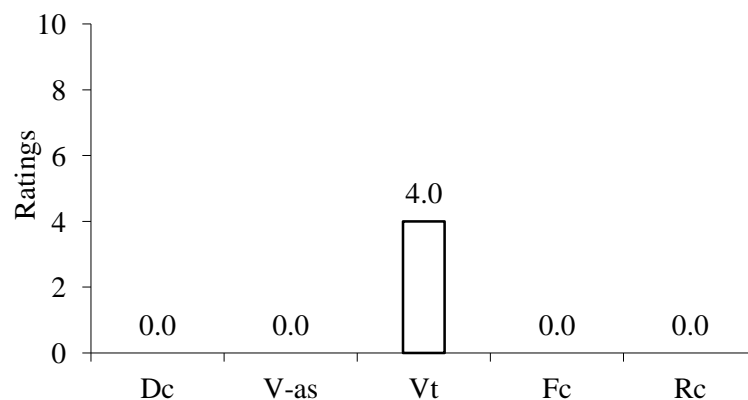
Figure 10: Rating for reproductive status sub-parameters

Veterinary services

- No doctor at present location. Doctor from Karnataka is said to treat the elephant once a month
- No veterinary assistant is used.
- No Veterinary facility (clinic) available.

Availability of veterinary services with experience in treating elephants is given higher rating. Overall rating was 0.8 (SE = 0.9, N= 5) indicating bad conditions for this parameter. There was no doctor available for the elephant at this location. A doctor was reported to be available in the neighboring state of

Karnataka. Hence, rating was 0.0 for this feature. A doctor was said to visit from the neighboring state once a month. Rating was 4.0 for this sub-parameter. No records (health, service, clinical) were maintained for the elephant. Hence, rating was 0.0 for this sub-parameter (Figure 11).



Dc: Doctor Availability V-as: Veterinary assistant availability Vt: Frequency of visits
Fc: Veterinary facilities availability Rc: Record maintenance

Figure 11: Rating for veterinary services sub-parameters

Infrastructure and personnel

- The following were available: Staff quarters, average condition; cooking shed, average condition; cooking vessels, adequate number, bad condition.
- The following personnel were employed: Manager, Mahout, cook

Expenditure

- Overall fund required per item/ animal/ year: Rs.3,00,000/-
- Annual man-power cost/animal/year (salaries): Rs.40,000/-
- Housing: Rs.12,000/-
- Travel: Rs.10,000/-
- The management is reportedly facing shortage of funds for maintaining the animal, as per the datasheet.

Overall mean ratings

Overall mean rating for the elephant Gajalakshmi was 3.3 (SE = 0.6, N = 53) implying occurrence of poor conditions in captivity. This rating is the mean across all the sub-parameters observed. Sixty-two percent of all the ratings were below five,

while fifty-two percent of the sub-parameters were given a rating of zero indicating complete absence of a feature suitable for the animal (Figure 12)

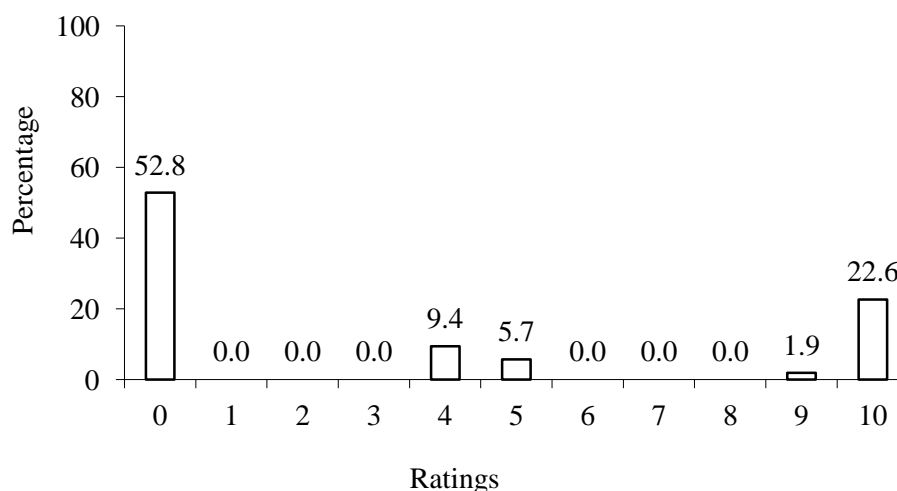


Figure 12: Percentage occurrence of ratings for elephant

Discussion

Maintenance of wild elephants in captivity requires the provision of facilities for the expression of species-typical behaviour, keeping the animal's biology as a reference (Stroud, in press). The rating for welfare status is based on this premise: the greater the deviation from an elephant's natural way of living, the lesser the rating, the poorer is its welfare.

- Elephants are considered social animals, living in groups and maintaining relationships, especially among females, that may last several generations (Sukumar, 2003). Keeping female elephants in social isolation can be considered to form one of the basic causes of poor welfare as the converse of providing social interaction is considered among the most sustainable form of enrichment (Veasey, 2006). The elephant Gajalakshmi was reported to be kept in social isolation. In the wild, Gajalakshmi would likely be living with a small herd of adult female relatives and young ones. To add to the social isolation, the elephant was chained for nearly 22 hours, effectively preventing unrestricted movement of the animal.
- Absence of functional reproductive status in the adult female due to its isolation.
- The physical space used by an elephant is important not only because of its size, but also because of its biology. Elephants are said to travel several kilometers foraging / searching for mates (Poole and Moss, 2008) across varied habitat. Home range sizes for females herds has been reported to be around 100 sq.kms (Sukumar, 1989), 200 – 300 sq.kms (Williams, in press) depending, among other factors, on the food and water availability within the areas studied. With this background, the space provided in captivity needs to be considered in terms of the effect of restricted space on the biology of the animal. Gajalakshmi, the elephant, was housed in a shelter measuring 125 sq.m., kept within the same small enclosure all day, every day, aside from the short time (around 2 hours) she was let out for temple processions and walks.

Wild elephants are said to be polycyclic in their activity patterns, being active for major parts of a day (Kane, et al., 2005). The absence of any “occupation” or goal directed behaviour for most of the day in the life of a chained animal can have serious consequences on its psychological welfare. Gruber et al., (2000) cites several authors on the association between stereotypical behaviour and absence of opportunity for performance of species-typical behaviours.

The elephant Gajalakshmi was described as being quiet without any incidents of aggression. However, she was also said to be “undependable.”

- Rating for frequency of drinking water by the elephant indicated moderate conditions. However, when skin condition of the elephant was considered, it was described as “dry” for its texture and “slow” for its elasticity. Both these terms are signs of inadequate water consumption (Cheeran, 1998) and poor health (Fowler and Mikota, 2006). Also, there was no provision for a bathing place wherein the animal could perform species typical activities such as being able to immerse itself in water/ dust-bathe/ wallowing (BIAZA, 2006).
- Unavailability of natural conditions for the little exercise the animal was exposed to: the only time the elephant walked, it was on roads. The animal was not allowed to free ranging in a natural/ semi-natural environment.
- No provision to free range to browse/ graze. Wild elephants have been observed to feed on a variety and number of plants (McKay, 1973) which involve performance of typical behaviours such as rubbing grass with distal part of trunk against forefoot to remove dirt, breaking branches using trunk/ leg or any available substrate, peeling off bark, along with other behaviors (Kurt and Garai, 2007).
- The most notable problem with Gajalakshmi’s health is not any visible symptoms but the lack of attention paid to her. Absence of any kind of records regarding the animal’s health or related to animal keeping; no vaccination provided or samples tested for biochemical/ health parameters. The practice of oiling the skin was also not followed.

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Section 3

Captive elephants of temples of Karnataka State

Executive summary

The study aims at assessing the welfare status of captive elephants maintained by temples across different districts of Karnataka. These elephants were sampled to record morphometric observations of the animal, their physical environment, occurrence of stereotypy, health status, and management practices adopted regarding feeding, bathing, work type and other daily routines.

The investigation quantifies the welfare status of the captive animals by recording their physical, physiological and behavioural environment through a number of parameters. Relevant data on the animal handlers is also collected and assessed. Each of these parameters was rated on a scale of 0 to 10 with 10 representing ideal living conditions for the animal as experienced by it in its wild state. 0 represents the worse possible situation for that parameter.

Thirty two elephants were observed across different temples in Karnataka. Mean age was 23 years. They included five males and 27 females. Mean rating for source of animal was 2 suggesting that the captive animals were most often purchased or exchanged or gifted.

Twenty one elephants were sourced from the Forest Department. Mean rating of 0.0 for type of previous owner indicates change from a previous semi-natural state to the present unnatural conditions.

The most common type of shelter is a wall with sheet cover followed by concrete/stone structures; some are tied under tree(s). Eighty percent of the shelters have stone or concrete floors, the elephants are chained for an average of 14.9 h/day, and the duration ranged from 3 to 22.5h/day. The overall mean for shelter was 3.14 averaged across the sub-parameters.

Sixty percent of the elephants were provided water from taps, while 30% were given from more than one source and only 3% had access to rivers. The overall mean for water was 6.0 indicating provision and availability of less than ideal conditions.

Overall mean rating for opportunity to sleep in a suitable place for sufficient duration was 4.0 implying less than ideal conditions for sleep.

Observed elephants were walked on a range of terrain: on roads in cities and towns, near crop fields, around temples, within a sugar factory and in forest conditions. Mean distance covered while walking was 8 km ranging from 1 to 30 km. Mean rating for walk was 6.0 indicating the absence of free-ranging for walk or walking in unsuitable conditions such as tarred roads or stone.

Sixty six percent of the elephants were allowed to interact with other animals. Mean duration of interaction was 11 h ranging from 0 to 24 h, with 50% of the elephants interacting for less than three hours. Overall mean for interaction was 7.0 indicating occurrence of moderate conditions for interaction and related features.

Sixty two percent of the observed animals exhibited stereotypy such as swinging head, body movement to and fro, shaking head, moving head and trunk, etc. Mean rating for the occurrence of stereotypy is 4.

The animals performed work related to the temple such as standing in front of temple, blessing devotees, garlanding, participating in processions, bringing water from the river, etc. for a mean duration of 2.8 h with a range of 0.5 to 7.5 h. Mean rating was 1.0 and all the ratings were less than 3.0.

Eighty percentage of the animals were stall-fed while only 7% were allowed to range free. The food provided included rice (*Oryza* sp.), ragi (*Eleusine* sp.), jaggery (sweet liquid derived from sugarcane (*Saccharum* sp.)), horsegram (*Dolichos* sp.), bamboo leaves (*Bambusa* sp.), grams, variety of greens, palm leaves (Family Arecaceae), maize (*Zea mays*), straw, coconut (*Cocos nucifera*), boiled rice and sweets like *payasam* (viscous milk pudding), *prasadam* (sacred offering), *kadubu* (fried; wheat flour, jaggery and dry coconut based sweets) etc. Mean rating for food-related parameter was 2 with 77% of the elephants getting a rating of 0.

Chaining and imposition of restriction on the animal's movement is a widespread practice. Overall mean rating for chaining-related parameter was 0.02 showing occurrence of bad conditions for this feature.

Seventy one percent of the elephants were not cycling and exposure to males was only 19%. Overall mean rating for reproductive status was 2.7; individual overall mean ratings ranged from 0.0 to 10.

Disease/injury occurrence was 81% with foot-related problems appearing in 44% of the elephants; the overall mean rating was 5.0

The overall mean rating for mahouts, assessed across 15 parameters, was 7.0 and 5.0 for cawadis. Their overall mean rating indicates that the welfare status falls in "moderate" category.

The mean rating across all the parameters was 4.0. Only 34% of the ratings ranged from 7.5 to 10. Overall rating value of elephants in the temples observed was 3.0 implying adverse living conditions.

Introduction

Elephants have been depicted in temple architecture as a hoary tradition, the practice of keeping elephants in temples maybe equally ancient. Notwithstanding the long, perhaps well-established methods of elephant keeping in temples, their living conditions (physical and psychological) have found little mention in texts. This is significant considering the distribution of elephant keeping temples in this state. In relation to other interest, temples appears to use elephants specifically for the religious significance and, unlike some of the other institutions, the agenda of keeping elephant in temples has never been for any commercial interests. However, due to rigorous financial crisis relating towards running the temple administration, some of the temples are not in a position to manage elephants there. This leads to handlers or others associated with the temple, to force the elephants to generate resources for them, their family and for itself. Utilizing elephants for commercial interests and the unnatural environment provided to elephants while they are being in temple or forced for generating its own resources make the management of elephants in temple more challenging.

Objective

The study aims to assess the welfare status of captive elephants maintained by temples across different districts of Karnataka. Welfare status of an animal is affected by deviation in terms of living conditions, social environment, freedom of choice and performance of natural behaviours as experienced by their wild counterparts. The study aims to quantify the welfare status of the captive animal by recording their physical, physiological and behavioural environment through a number of parameters. Relevant data on the animal handlers is also collected and assessed.

Method

Elephants maintained by temples across different districts were sampled to record their morphometric, their physical environment, occurrence of stereotypy, health status, management practices adopted regarding feeding, bathing, work type and other daily routines. Each of these parameters is rated on a scale of 0 to 10 with 10 representing ideal living conditions for the animal as experienced by it in its wild state and 0 the worse possible situation for that parameter.

The suitability of a parameter depended on the replication of near-natural conditions for the animal. The more the deviation from this state, the lesser is the rating.

Ratings were graded in the following manner:

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

Each parameter was studied in terms of sub-parameters. Sub-parameters have been averaged to give the overall mean for that particular parameter. For instance, the shelter provided to the animal was sub-divided into a number of factors such as: (i) shelter type whether the shelter was made of asbestos sheets or concrete or natural materials, (ii) shelter size and (iii) floor type.

A shelter made of asbestos sheet was given a lower rating than that made of natural materials as asbestos sheets tend to be less conducive to extreme variations in temperature than shelters with thatched roof. A shelter with natural forest conditions is given higher value than one with a thatched roof. Wherever possible, ratings have been compared for statistical significance.

Of the 73 sub-parameters, data was collected for 56 % of the variables, ranging from 22.53 to 82.5. The result depicting percentage occurrence of rating from 0 to 10 uses rounded- off values, with each number being considered in the continuum from 0.4 to 1.4. For a value such as 8, all rating values from 7.5 to 8.4 are included.

Results

Population status

Thirty two elephants were observed across different temples in Karnataka. Mean age was 22.7 yrs (SE = 0.13, N = 27) which included five males and twenty seven females. Mean age for female elephants was 24.13 yrs (SE = 0.16, N = 23) ranging from 9 to 51 yrs. Mean age for males was 14.6 yrs (N = 4) ranging from 11 to 17.5 yrs.

Origin of the captive elephant

Twenty eight elephants were said to have been purchased/gifted or exchanged with the mean age being 8.9 yrs (SE = 0.16, N = 21). One particular elephant, (a female, belonging to Maridevara Mutt), was purchased at the age of just 3 yrs. Following this, it seems to have been shifted to three different temples, inclusive of the present location. Its previous wild state or having been born in captivity has been rated. Those born in captivity have been rated higher than all other types as it indicates reproductive health of the captive mother. Those that have been captured from the wild have been given low scores (Figure 1). Mean rating value of 2.4 (SE = 0.03, N = 19) shows that the captive animals were most often purchased or exchanged or gifted (94.7%). Nearly 6% of the animals have been brought in by capture from the wild.

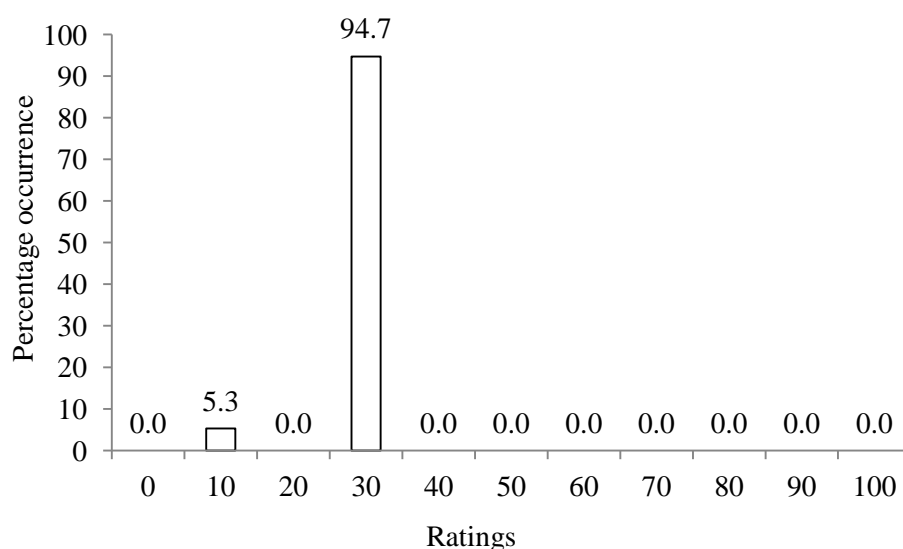


Figure 1: Percentage occurrence of ratings for origin of elephants in temples of Karnataka

Type of previous owner

The available data shows that 21 elephants were sourced from the Forest Department. The change in conditions experienced by the elephant from a natural state to a semi-natural one or vice-versa or to an unnatural environment was rated by collecting data on the previous owner. High values indicate change from unnatural to semi-natural conditions with ideal management conditions, facilities and expertise. Low values show change from semi-natural to unnatural conditions. Mean rating value of 0.0 (SE = 0, N = 18) indicates change from a previous semi-natural state to the present unnatural conditions.

Shelter

- The most common type of shelter is a wall with sheet cover (N = 16) followed by concrete/ stone structures (N = 4). Four elephants were tied under tree(s). One female of Sirigere Temple was housed in a godown while a 17.5yrs, male, of Samson Distilleries, Davanagere, was housed in the distillery/sugar factory premises or tied below a tree.
- Mean shelter size was 388 sq m (SE = 327.8, N= 25), ranging from 2.36 for an adult female, belonging to Sri 108 sq m Acharya Keshu Bhusan Trust to 8,094 for adult female, belonging to Maridevara Mutt.
- Eighty percent of the shelters (N = 30) had stone or concrete floors and the animals are chained for an average of 14.9 h/day (SE = 0.8, N = 21). The duration of chaining ranges from 10 h/day to 24 h
- Shade from trees/forest is available for ten elephants observed. Shade is available from asbestos sheets for 5 animals and from concrete/stone buildings for three animals. One adult female of Nanjundeshwara Temple is kept in front of the temple in the open from 6 to 10 a.m. A male elephant belonging to Shirur Temple is exposed to the sun during daytime.

Parameters related to shelter have been rated using five sub-parameters (Figure 2). The overall mean for shelter was 3.14 (SE = 1.7, N = 5), averaged across the sub-parameters.

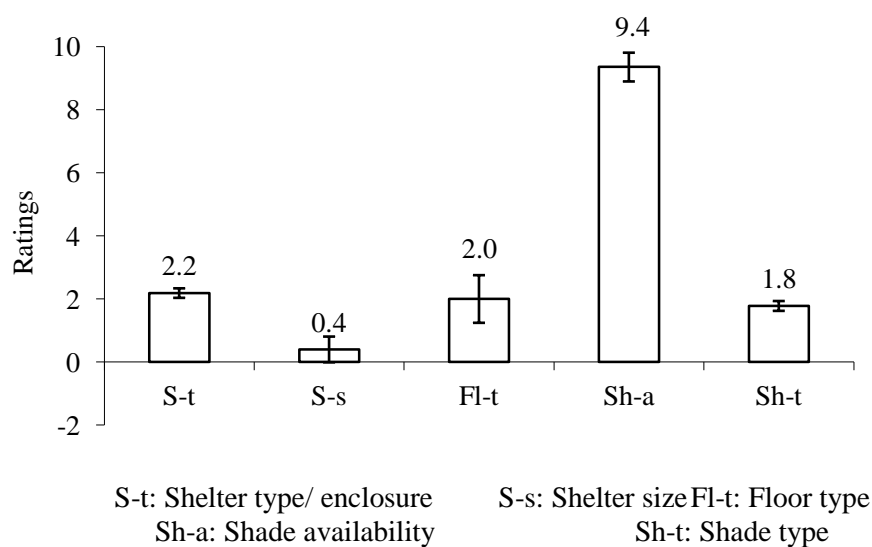


Figure 2: Rating for shelter-related parameters of captive elephants in temples of Karnataka.

- Overall shelter rating of 0.0 for the elephant one adult female, belonging to Sri Jagadguru Pakkireshwara Samsthana Mutt, Gadag, as the elephant does not have any enclosure/shelter and there is no provision of shade.
- Overall shelter rating of 7.5 for one adult female, belonging to Sri Rambhapuri Mutt, as the elephant had access to earthen flooring and tree shade. However, its shelter is open, under a tree.

Distribution of ratings for elephants in temples is presented in Figure 3; values less than 4.0 contributed 80%, and 20% scored 10.

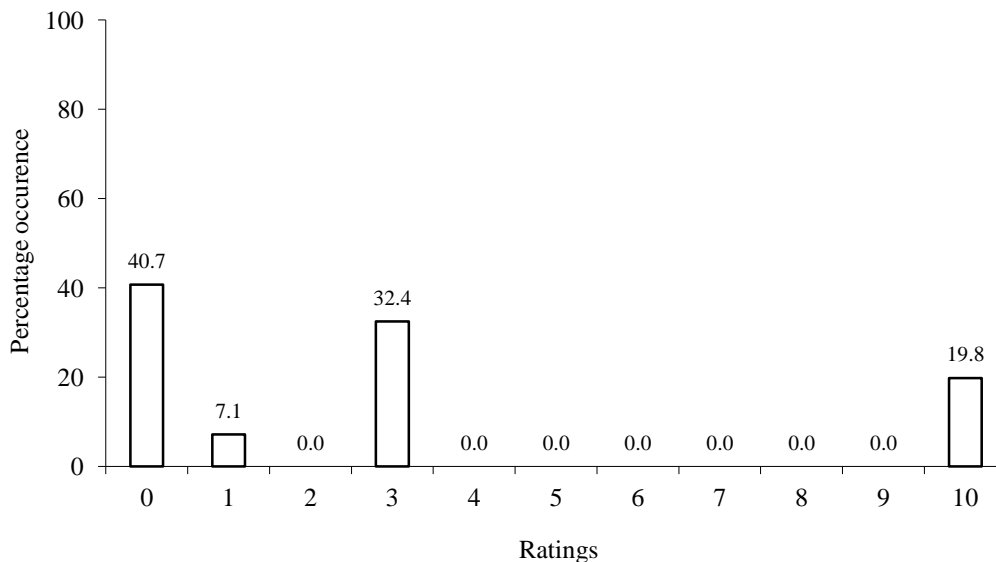


Figure 3: Distribution of ratings for captive elephants in temples of Karnataka

Mean rating for shelter type was 2.2 (SE = 0.15, N = 32) showing use of a structurally enclosed space as shelter for the captive animal. The low rating also reflects the restriction imposed on the movement due to the nature of the shelter. A rating of 0 is given to the elephants belonging to Sri Jagadguru Pakkireshwara Samsthana Mutt, (Gadag), Mukti Mandir Dharma Kshetra (Gadag), and to Samson Distilleries (Davanagere). The rating indicates absence of shade in the shelter and no man-made enclosure.

Shelter size available, a related sub-parameter, was rated with the maximum value given to the animal allowed to range free and lower values for any size less than 5000 sq m. Mean rating was 0.40 (SE = 0.40, N = 25) with just one female, belonging to Maridevara Mutt being given a rating of 10 for shelter size. Chronic exposure to unsuitable hard substrate leads to foot problems in the animal. In this context, flooring which is similar to natural conditions has been given a higher rating. Mean rating for floor type was 2.0 (SE = 0.75, N = 30) with 80% of the elephants exposed to hard substrates; 66.7% of the animals exposed to concrete floors have foot/leg injury. Only six elephants belonging to six temples were given a rating of 10 indicating provision of suitable floor type. Shade assumes importance as captive elephants are normally restricted in their movements. Mean rating was 9.4 (SE = 0.45, N = 31) with 94% of the elephants getting a rating of 10 indicating the availability of shade. Only two elephants, one of Sri Jagatguru Pakkireshwara Samsthana Mutt (District Gadag) and

the other of Mukti Mandir Dharma Kshetra (District Gadag/Dharwad) get a rating of 0 showing the absence of shade.

Water and related parameters

- Sixty percent of the elephants get water from taps, while 30% get from more than one source (N = 30). Only 3% have access to river water as a drinking source.
- Mean number of times the elephants drink is 3.1 (SE = 0.13, N = 30) ranging from 2 to 5 times/day. Mean quantity of water drinking per day was 156 (SE = 19.1, N = 28) ranging from 12 to 325 l/day. One female, drank fewer times as the water was salty. Three temples had created artificial ponds for their animals.
- Twenty eight percent of the elephants are bathed using tap/well water, 25% use tank/lake/ ponds.
- Mean bathing duration of bath was 1.8 h (SE = 0.18, N = 30) ranging from 0.13 to 3.5 h. Ninety eight percent of the elephants were given a bath of less than four-hour duration. Only six elephants bathed for 3 h. Different materials were used as scrub: brush, stone, brick, and naturally available substances like coconut fibre. Only six percent of the temples used coconut brushes. Fifty percent used stone or brush and 34% both brush and stone (N = 32) and soap was also used for two elephants one with the temple Sri Devi Annapoorneshwari Kshetra and the other with Nanjundeshwara Temple, Nanjangood, Mysore.

Water related parameter has been rated using six sub-parameters (Figure 4). The overall mean for water was 5.83 (SE = 1.03, N = 6) indicating less than ideal conditions.

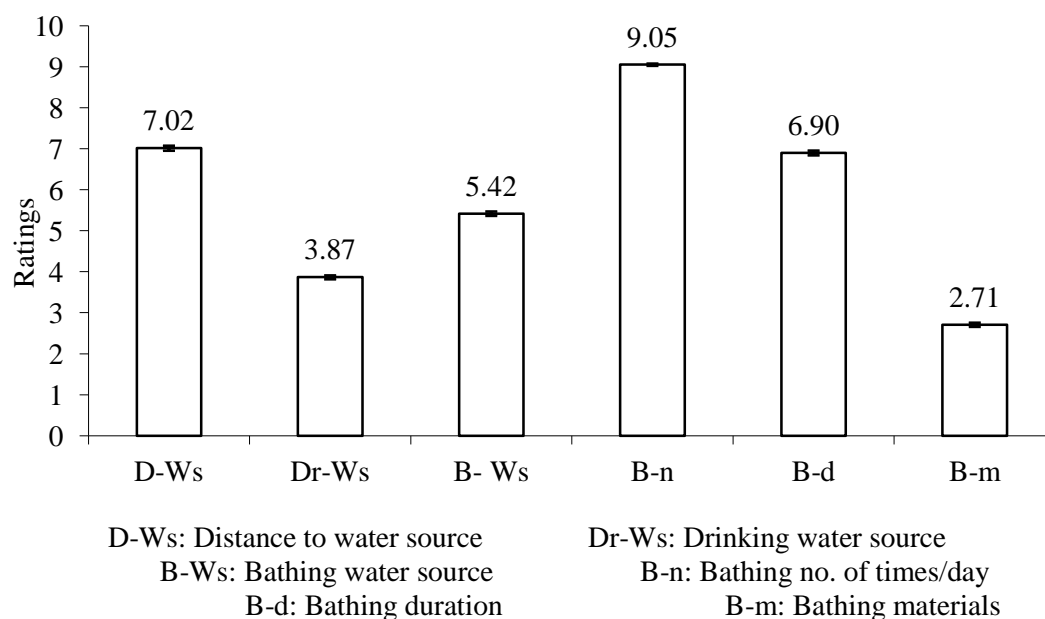


Figure 4: Ratings for water-related parameter for elephants in temples of Karnataka

- Rating of 2.33 was given for a female, belonging to Shri Maralu Siddeshwara Temple: source of drinking/bathing water was 2 km which raises the

possibility of inaccessibility to water when the elephant needs it as she is said to be chained for 16 h. Also, the rating reflects the use of unsuitable scrubbing material while bathing.

- Rating of 7.67 was given for a female, belonging to Sri Devi Annapoorneshwari Temple: relatively higher scores have been given as the animal is given the recommended duration of bath, for materials used for scrubbing and for distance to water source. However, drinking water source needs to be improved as it is from a tap and is not always accessible to it.

Distribution of ratings for temple elephants shows that (Figure 5) the ratings of 34% of the ratings were less than four and 32% were greater than 8.0.

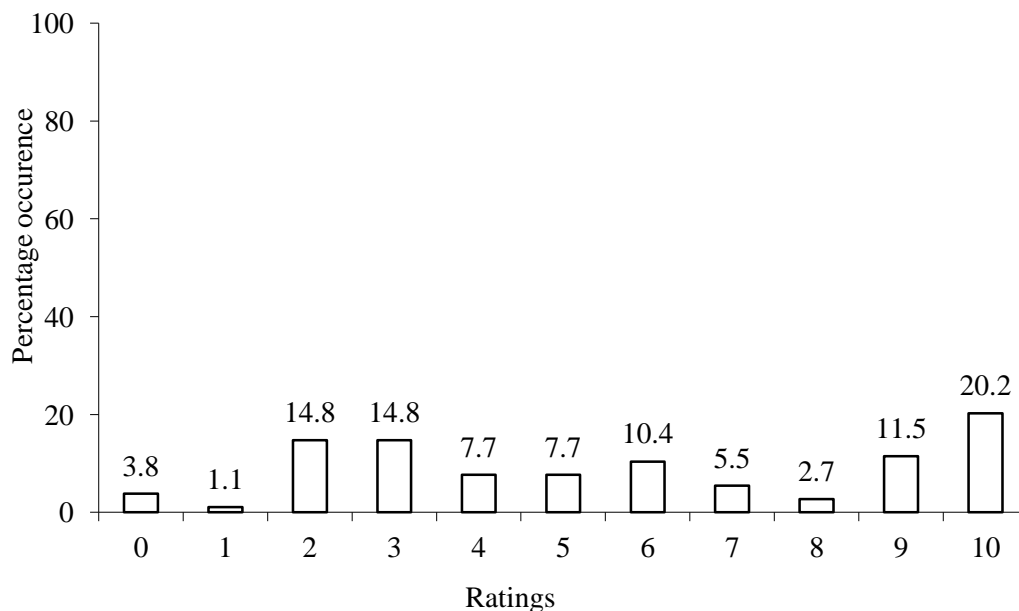


Figure 5: Distribution of ratings for captive elephants of temples of Karnataka

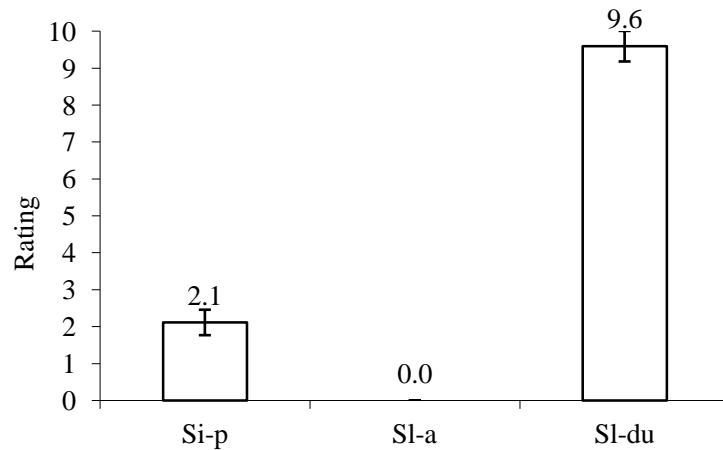
- Source of drinking water, is rated based on the availability of free-flowing water. Mean rating was 3.9 (SE = 0.34, N = 30) showing the use of small water bodies like tanks/ponds and tap water by 80% of the sampled places. Elephants belonging to Sri Kukke Subramanya Temple, were given a rating of 10 as the source of water is a river.
- Mean rating for bathing water source was 5.4 (SE = 0.45, N = 31) implying provision of larger sources of water like lakes or reservoirs with only 16% of the temples using rivers as a source.
- Materials such as plastic brush or brick which are hard and maybe abrasive to the skin have been given lower rating. Mean rating was 2.7 (SE = 0.4, N = 31) indicating the use of hard material for scrubbing. The elephants, belonging to Sri Devi Annapoorneshwari Temple and Kateel Sri Durga Parameshwari Temple, Mangalore get a rating of 10 as coconut fibre is used for scrubbing.

Sleep and related parameters

- Of the 31 observations on sleeping place, 65% were reported, unambiguously, to use the shelter as the sleeping place. Mean sleep duration was 5.9 h (SE =

0.4, N = 23) ranging from 1.5 to 12 h. Ninety-one percent of the elephants slept at night.

Giving the elephant an opportunity to sleep in a suitable place for sufficient duration was rated. This was measured over three sub-parameters (Figure 6). Overall mean rating was 3.9 (SE = 3.57, N = 3) implying less than ideal conditions for sleep.



SI-p: Sleeping place SI-a: Sleeping area SI-du: Sleep duration
Figure 6: Ratings for sleeping-related parameters for captive elephants in temples of Karnataka

- Elephants with rating less than 3 were from Suttur Mutt, Mysore and Samson Distilleries, Davanagere

Distribution of ratings (Figure 7) of sleep-related parameters show that 25% ratings fall below 4.0.

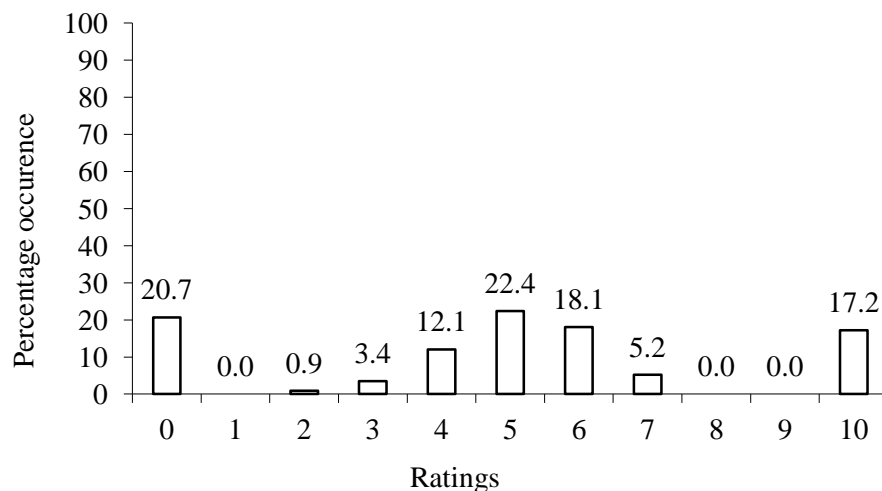


Figure 7: Distribution of ratings for sleep-related parameters for captive elephants of temples of Karnataka

- The place where the animal is allowed to sleep has been rated for its suitability on a scale similar to that of the type of shelter. Mean rating was 2.1 (SE =

- 0.34, N = 31) with values ranging from 0 to 4 indicating the use of non-natural materials for the place or keeping the animal restricted in its movement by chaining it.
- Mean rating assigned for the size of sleeping place was 0.0 (SE = 0, N = 12) indicating small size of the animal's sleeping place.
 - Mean rating for sleep was 9.6 (SE = 0.41, N = 21) implying sufficient sleep for the animal. Only one elephant, a 14yrs male of Suttur Mutt, Mysore, scored 1.5 indicating less than adequate duration of sleep.

Walk and related parameters

- Observed elephants walked on a range of terrain: on roads in cities and towns, near crop fields, around temples, within a sugar factory and in forest conditions. One male elephant, walked for 6 km between Haragere and Alkanoor begging for fruits and vegetables from the market.
- Mean distance covered while walking was 8.21 km (SE = 1.35, N = 29) ranging from 1 to 30 km.
- Elephants belonging to Shirur Temple and Saundatti Yellamma Temple walked 1 km.
- Elephants belonging to Bichali and Suttur Mutt, Mysore, walked 30 km a day.
- Mean walking duration was 3.8 h (SE = 0.43, N = 30) ranging from 1 to 10 h.
- A female, belonging to Sringeri Temple walked for 1 h and a female, belonging to Sri 108 Acharya Keshu Bhusan Trust walked for 10 h.

Allowing the elephant to walk on suitable terrain or time of day is significant as they are subjected to long periods of inactivity or unnatural activity. Mean rating for allowing to walk was 5.5 (SE = 0.27, N = 31) indicating the absence of free ranging for walk or walking on unsuitable conditions such as tarred roads or stone. The elephants belonging to three temples Sri Rambhapuri Mutt, Hombuja Jain Mutt and Suttur Mutt, Mysore were given a rating of 10 and the rest of the elephants (90%) got a rating of 5.0. Mean rating (Figure 8) for time of day for walking was 3.2 (SE = 1.2, N = 14) implying being made to walk during late morning or early evening hours on natural terrain. Ratings ranged from 0 to 10 with 57% of the elephants getting a rating of 0.

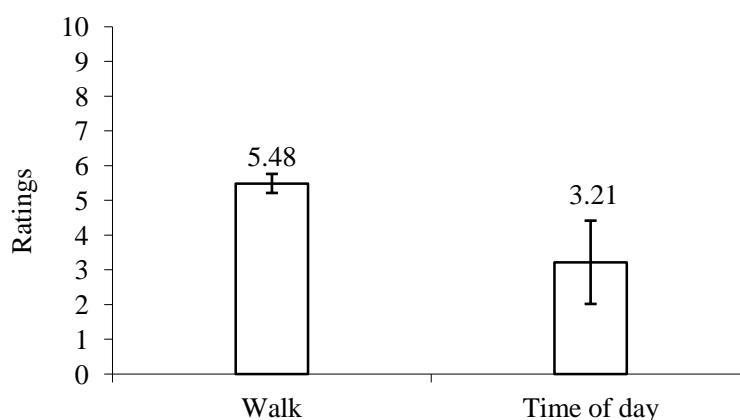


Figure 8: Ratings for walk and time of walk for captive elephants of temples in Karnataka

The elephants, belonging to Hombuja Jain Mutt and Suttur Mutt, Mysore were given a rating of 10 for this parameter.

Social interaction

- Sixty six percent of the elephants were given opportunity for interaction with other animals. The remaining animals were allowed no interaction.
- Mean duration of interaction was 10.6 h (SE = 3.8, N = 10) ranging from 0 to 24 h, with 50% of the elephants interacting for less than three hours and 40% for 24 h (N = 10).
- Mean number of individuals for interaction was 2.0 (SE = 0.6, N = 16) ranging from 1 to 10 animals with 94% of the elephants interacting with three or lesser number of individuals. Eighty three percent of the elephants had only females for interaction while 6% interacted only with males (N = 18). Only two elephants had both males and females as part of a group. Ten temples had elephants with female: female combination while six had male: female combination.

The maintenance of single elephants precluding any kind of social interaction with other elephants is a feature of many captive elephants systems. The opportunity for social interaction was rated across four sub-parameters. Overall mean (Figure 9) for interaction was 6.63 (SE = 1.2, N = 4) indicating moderate conditions for interaction and related features.

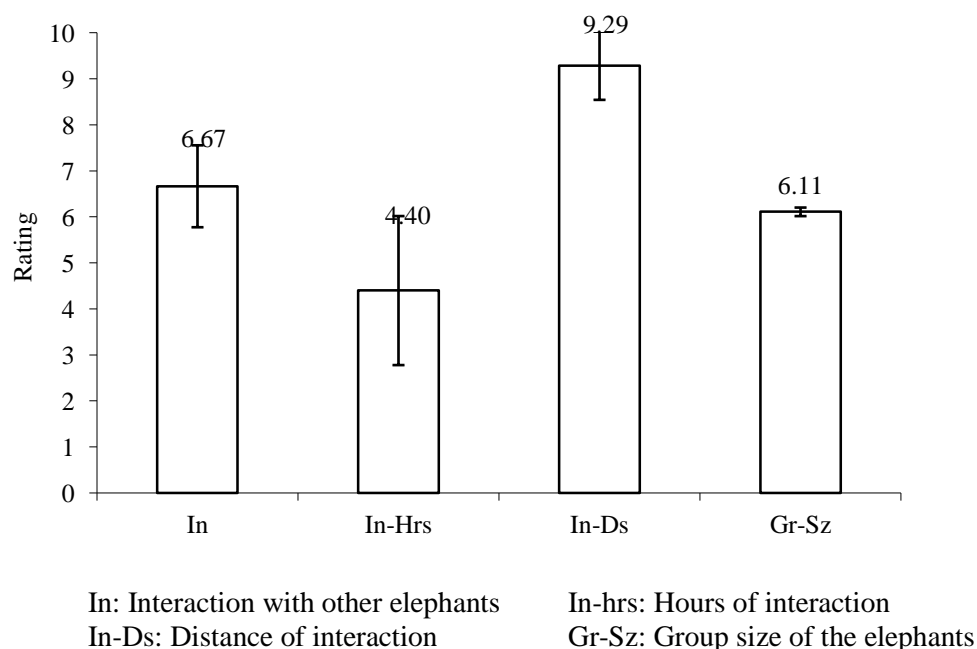


Figure 9: Ratings for interaction-related parameters for captive elephants of temples of Karnataka

- A female elephant belonging to a temple in Bichali got an overall rating of 5.67 as the interaction distance was > 2 m and the group size consisted of

- only females two adults and one sub-adult without any opportunity for free ranging.
- A female elephant belonging to Hombuja Jain Mutt got an overall rating of 9.25 as the elephant was allowed interaction for 24 h within reachable distance.

Distribution of ratings for interaction shows interesting observations: about 24% elephants have no interaction among them and 51% of elephants are exposed to satisfactory rating (Figure 10).

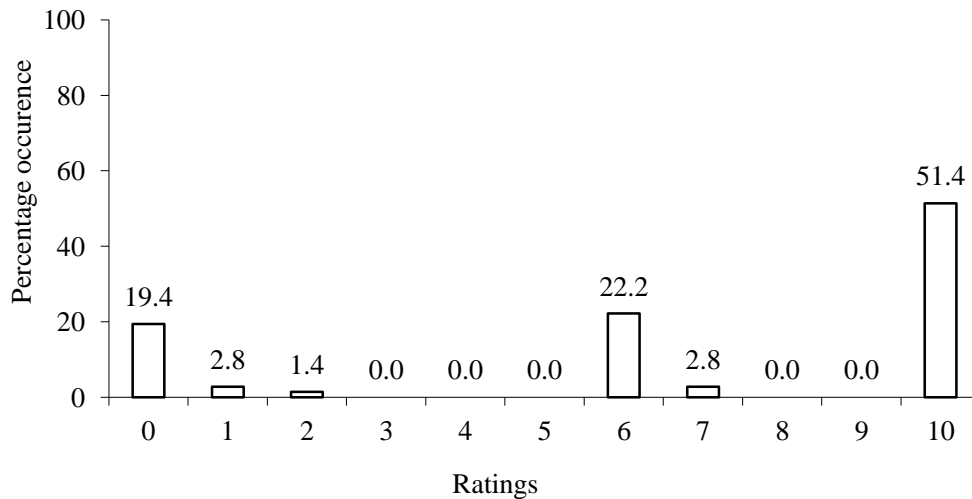


Figure 10: Distribution of ratings for interaction among the elephants of temples in Karnataka

The ratings for providing opportunity for the captive elephant to interact occurred in two categories only: 10 occurrence of interaction, 0 absence of interaction. Mean rating was 6.7 (SE = 0.89, N = 30) with 67% of the elephants reported to be allowed to interact with other elephants. High ratings indicate group size replicating that found in the wild. Mean rating was 6.2 (SE = 0.09, N = 18) implying the presence of male–female or all-female groups, with restricted movement due to lack of free-ranging opportunity.

Training

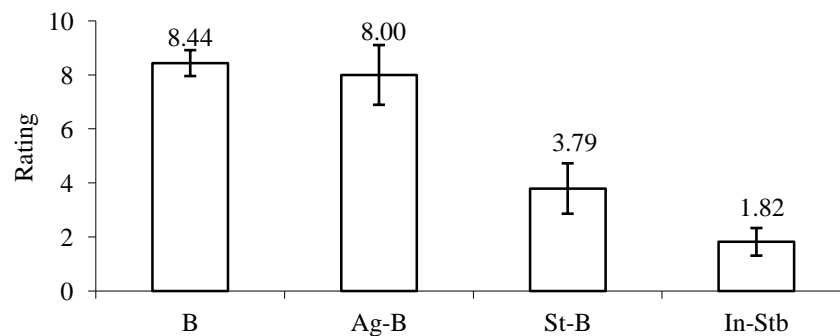
Ninety one percent of the animals are trained. Training type involves temple activities, logging, garlanding, trumpeting, going backwards, lifting legs, etc. Mean number of commands used is 17.6 (SE = 3.0, N = 24) ranging from 3 to 75.

Observed Behaviour

- The temperament of the animals was classified into different categories. Sixty-nine percent were calm/docile, 13% were predictable and 19% nervous/calm and nervous. Thirty nine percent of the elephants were rough with three reported incidents of injuries or killing of people. All the reported incidents involved injury/death of the mahout. In one incident, a male elephant of Shirur Temple had killed its mahout as the handler had beaten the animal in a drunken state.

- Sixty two percent of the observed animals exhibited stereotypy (N = 29) such as swinging head, body movement to and fro, shaking its head, moving its head and trunk, etc.

The assessment of the behaviour of a captive animal assumes importance in the context of deviation from a natural environment. The temperament of the animal, occurrence of aggressive behaviour and expression of stereotypy are all indicators of the health of the system managing the elephants. Behaviour of the animal was averaged across four sub-parameters (Figure 11). The overall mean rating was 5.51 (SE =1.87, N = 4) indicating occurrence of unsuitable environment resulting in expression of unwanted behaviour.



B: Observed behaviour Ag-B: Aggressive behaviour towards people
St-B: Stereotypic behaviour In-Stb: Intensity of stereotypic behaviour

Figure 11: Ratings for behaviour-related parameters for captive elephants of temples of Karnataka

- A female elephant, belonging to Sri Saundatti Yellamma Temple, got an overall mean rating of 1.88 for expression of nervous behaviour, aggression towards people and for the presence of stereotypic behaviour.
- Four elephants got an overall rating of 10 as these elephants were described as calm, with no aggressive behaviour towards people and no observed stereotypy.

Distribution of ratings for behaviour-related parameters is presented in Figure 12, showing 37% occurrence of ratings less than four.

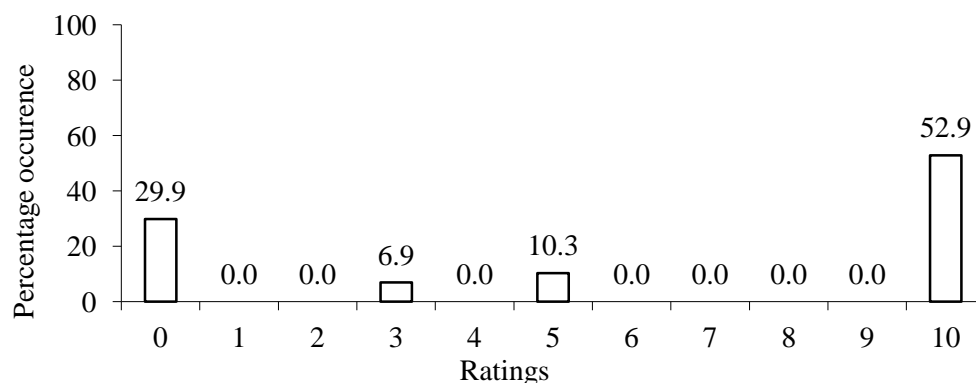


Figure 12: Distribution of ratings for behaviour-related parameters of captive elephants of temples in Karnataka

Observed behaviour, reflects the ease of managing the elephant. Mean rating of 8.4 (SE = 0.48, N = 32) for this sub-parameter implies manageable behaviour. However, it should be noted that this behaviour may have resulted from being conditioned to be so. Only one elephant, belonging to Krishna Temple, Udupi, got a rating of 0.0 indicating aggressive/unpredictable behaviour. Twenty five percent of the animals were nervous.

High rating for incidents of injury/ killing implies no occurrence of such incidents. Mean rating for this sub-parameter was 8.0 (SE = 1.11, N = 15) with 80% getting a rating of 10. Low rating indicates the occurrence of stereotypy in the observed animals. Mean rating was 3.8 (SE = 0.93, N = 29) with 62% reported to express stereotypy.

Work type

- The animals performed work related to the temple such as standing in front of the temple, blessing devotees, garlanding, participating in processions, bringing water from the river, etc. for a mean duration of 2.8 h (SE = 0.59, N = 23).
- Work duration ranged from 0.5 to 7.5 h. Thirty nine animals worked for 1 h/day while 48% worked between 2 and 5 h.
- The mean age of elephants when they had begun work was 10.8 yrs (SE = 3.28, N = 12) ranging from 2 to 35 yrs. Fifty percent began working when they were 5 yrs or less.
- Seventy nine per cent sought donations (fruits, vegetables, money, sweets) from the public.
- The mean maximum weight carried was 116 kg (SE = 38.5, N = 10).

Low rating for work-related parameters indicates the nature of work to be unnatural to the elephant. Mean rating was 0.9 (SE = 0.18, N = 28); all the ratings were less than 6.0 implying such activities as performing pooja, standing in front of the temple, being part of a procession, blessing devotees, etc. Only 60% of elephants got shade during work (Figure 13), 80% got water and about 75% were allowed rest during work.

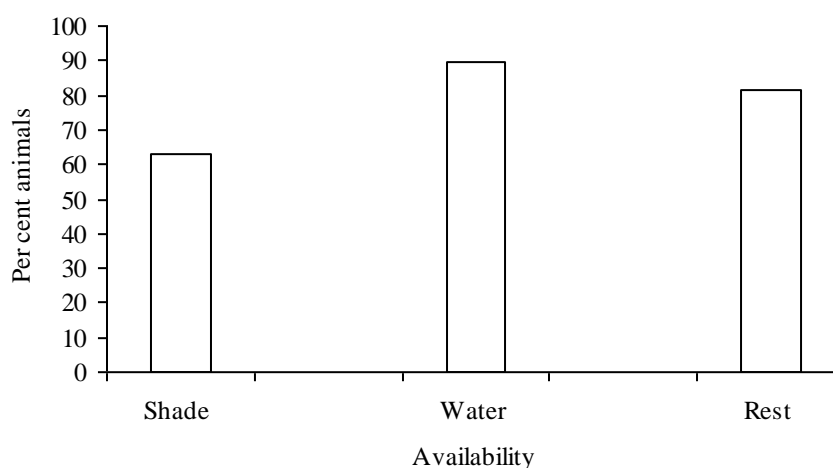


Figure 13: Percentage of elephants exposed to shade, water and rest in temples of Karnataka

Distribution of ratings (Figure 14) suggests that most of the values of captive elephants kept in temples fall in the range 0 and 1, and have not managed to score 6 to 10 ratings at all.

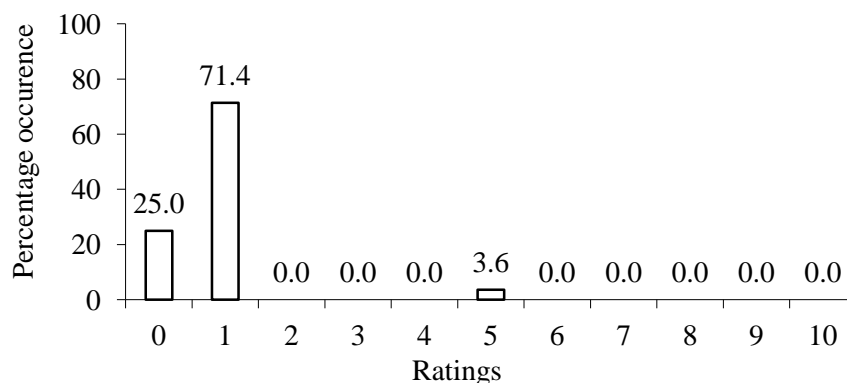
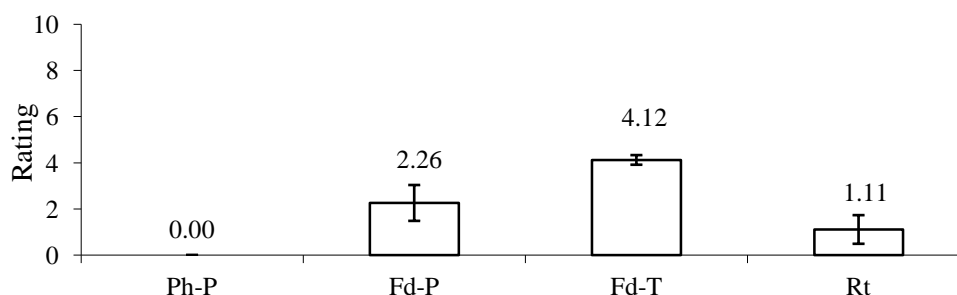


Figure 14: Distribution of ratings for work-related parameters of captive elephants in temples of Karnataka.

Provision of food

- Of the 30 elephants, 80% were stall-fed while only 7% were allowed to range free. The food included: rice (*Oryza* sp), ragi (*Eleusine* sp.), jaggery, horse gram (*Dolichos* sp.), bamboo leaves (*Bambusa* sp.), grams, forest produce such as a variety of greens, palm leaves (family *Arecaceae*), maize (*Zea mays*), straw, coconut (*Cocos nucifera*), boiled rice. Sweets like *payasam*, *prasadam*, *kadubu* were also given.
- A female of Mahalakshmi Temple was given some of the above and "hotel items"
- A female of Shri Siddalingeshwara Temple, Yedyuru, Kunigal Tq, Tumkur Dist food includes biscuits from devotees
- A female elephant belonging to Sri Mahalingeshwar Temple, female, was given some of the above items and also idli (steamed food made of rice) vada and dosa (fried food made from pulses and rice)

Method of providing food, i.e., either by stall-feeding or allowing to graze or both, the number of food items provided, alteration in diet, ration chart usage were rated. The overall mean for food-related parameter (Figure 15 and 16) was 1.38 (SE = 0.61, N = 4) with rating for each elephant ranging from 0.0 to 5.13.



Ph-P: Provision of food during physiological periods Fd-P: Type of food provisioning
Fd-T: No. of food items Rt: Usage of ration chart

Figure 15: Ratings for food related parameters for captive elephants of temples in Karnataka

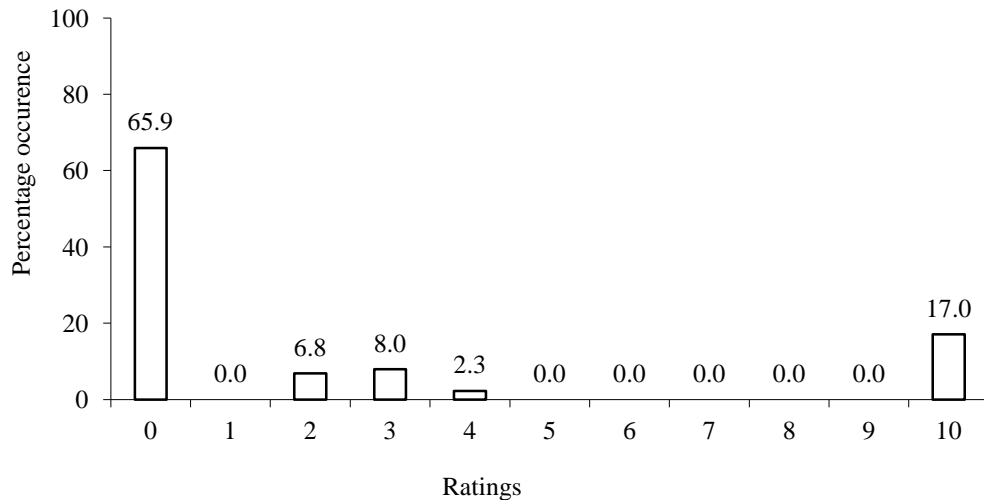


Figure 16: Distribution of ratings for food related parameters of captive elephants in temples of Karnataka

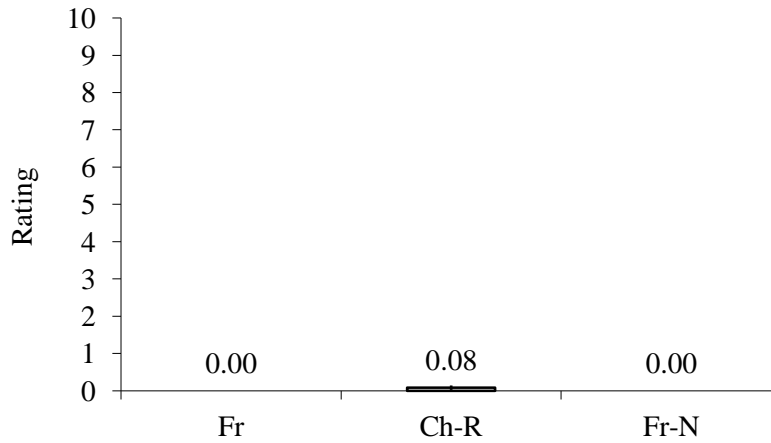
High rating for method of providing food indicates the use of stall-feeding and allowing the elephant to graze. Mean rating for food provisioning type was 2.3 (SE = 0.7, N = 31) with 77% of the elephants getting a rating of 0.0. This shows most of the elephants were not allowed to graze for themselves. However, elephants belonging to Sri Kollur Mookambika Temple, Sri Rambhapuri Mutt Sri Kshetra, Dharmasthala, Sri Siddalingeshwara Temple, Yedyuru, Kateel Sri Durga Parameshwari Temple and Hombuja Jain Mutt are said to be allowed to graze and given stall-feed.

Usage of ration charts helps in maintaining the diet of the animal and also in the inventory of supplies. Mean rating was 1.11 (SE = 0.62, N = 27) with 89% of the temples not using a ration chart. The institutions which used ration chart were Sri Kshetra, Dharmasthala and Nanjundeshwara Temple, Nanjangud, Mysore.

Free-ranging status

- All the elephants observed (N = 27) were chained. However, it may also refer to the fact of a chain tied around the animal rather than being tied to one place.
- Mean chain weight (tied to the leg) was 23.2 kg (SE = 4.6, N = 25) ranging from 2.5 to 110 kg.
- Mean chain length (leg) was 371.6 cm (SE = 46.65, N = 20) ranging from 135 to 840 cm. All the elephants were tied with a chain of length less than 100 cm or 1 m.
- Mean chain size (leg) was 1.8 cm (SE = 0.58, N = 20).
- None of the animals was allowed to range free at night (N = 24).

Chaining and imposition of restriction on the animal's movement are widespread practices. Hence, these aspects were rated using three sub-parameters (Figure 17). High rating indicates lesser dependence or absence of chains on the animal and greater freedom of movement. Overall mean rating was 0.02 (SE = 0.02, N = 4) showing bad conditions for this feature.



Fr: Free-ranging status Ch-R: Chaining region Fr-N: Free-ranging at night

Figure 17: Ratings for free-range status of captive elephants in temples in Karnataka

Distribution of ratings for free-ranging status of temple elephants is presented in Figure 18, and all values were less than two.

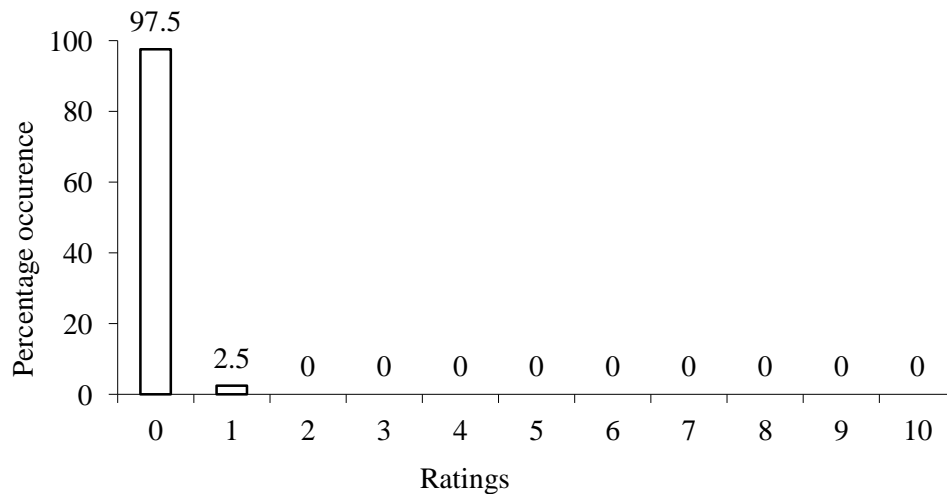


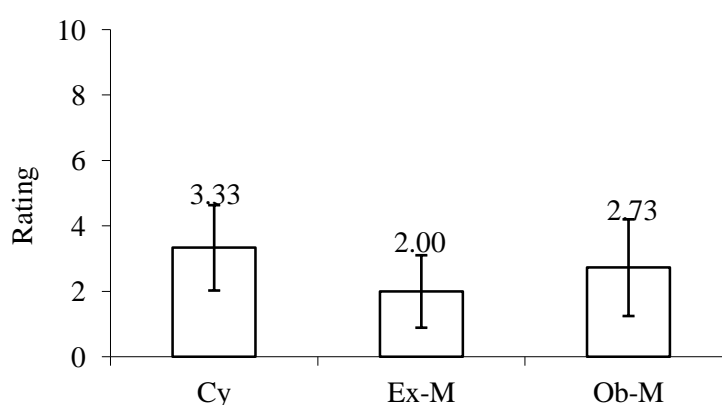
Figure 18: Distribution of ratings for free-ranging status of captive elephants in temples of Karnataka

- The restrictions imposed by chaining an animal leads to several health problems and welfare issues. Low rating for chaining status indicates lesser opportunity to move freely. Mean rating was 0.0 (SE = 0, N = 32) showing no free-ranging opportunity.
- Chaining an animal in more than one region of its body is practiced as a way of controlling the animal. Mean rating of 0.1 (SE = 06, N = 24) indicates the use of chain in more than one region.
- When captive elephants have no work at night, they are let out to range freely. Mean rating for free ranging at night was 0.0 (SE = 0, N = 24) showing that none of the sampled animals from the temples was allowed to range free at night.

Reproductive status

- Seventy one percent of the elephants (N = 14) were not cycling and exposure to males was only 19% (N = 16).
- Only two elephants had given birth to a calf each. Age at first birth was 15 yrs for one female and 25 to 26 yrs for another female.
- Two of the male elephants were in active reproductive state. Of the three male elephants for which data was collected, two are in musth. Two male elephants were chained for the duration of musth ranging from 36 months.

Reproductive status of a captive animal is considered to be an important parameter in terms of its welfare. It was rated across three sub-parameters (Figure 19). Overall mean rating for female reproductive status was 2.7 (SE = 0.47, N = 3) implying poor reproductive status and one elephant belonging to Nanjanagudu Temple got a rating of 10.0.



Cy: Cycling status of female Ex-M: Exposure to male Ob-M: Observation of mating

Figure 19: Ratings for reproductive status of captive elephants of temples in Karnataka.

Distribution of ratings show (Figure 20) that 73% occurrence of zero and only 27% occurrence of 10 values.

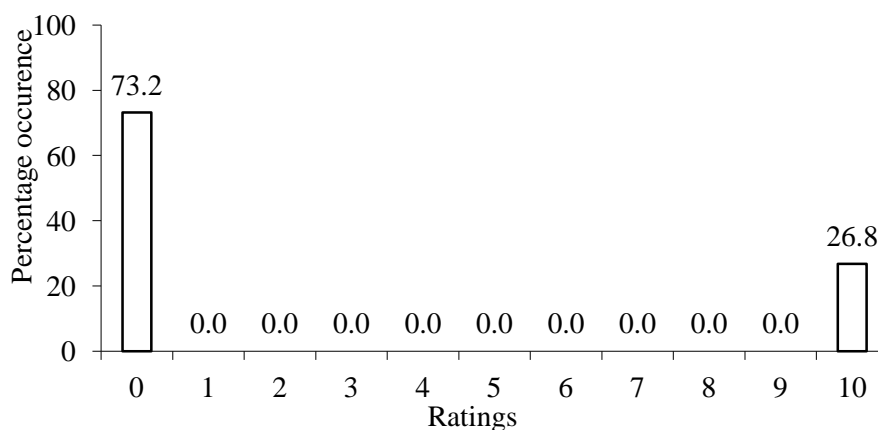


Figure 20: Distribution of ratings for reproductive status of captive elephants in temples of Karnataka

Low rating indicates fewer females in breeding condition. Mean rating was 3.33 (SE = 1.3, N = 15) with 67% of the sampled elephants not cycling (age ranged from 9 to 51 yrs). The animals reported to be cycling belonged to Sringeri Temple, Nanjundeshwara Temple, and Hombuja Jain Mutt, Karnataka. Providing an opportunity for the elephant to breed by exposure to males is an indication of attempt at maintenance of natural behaviour of the animal. Low rating for this parameter indicates the absence of male for mating. Mean rating was 2.0 (SE = 1.11, N = 15) implying lack of exposure to males. Eighty percent of the sampled animals were not exposed to males.

Captive elephants exhibit a range of behaviours when exposed to male elephants due to past interactions or simply absence of any interaction. When exposed to a male elephant, the incidence of mating was also rated. Mean rating was 2.7 (SE = 1.48, N = 11) with 73% of the places reporting no observation of mating incidents. The number of males among the temples studied was only five as opposed to 27 females. The data for reproductive status was scanty with sample size not exceeding three. The data is presented below:

- Two males, belonging to Samson Distilleries, Davanagere were reproductively active.
- The elephants, belonging to Shirur temple, and Samson Distilleries, Davanagere were said to be experiencing musth at the time of survey. Rating for both reproductive activity of males and musth occurrence was 6.7 (SE= 4.1, N= 3).

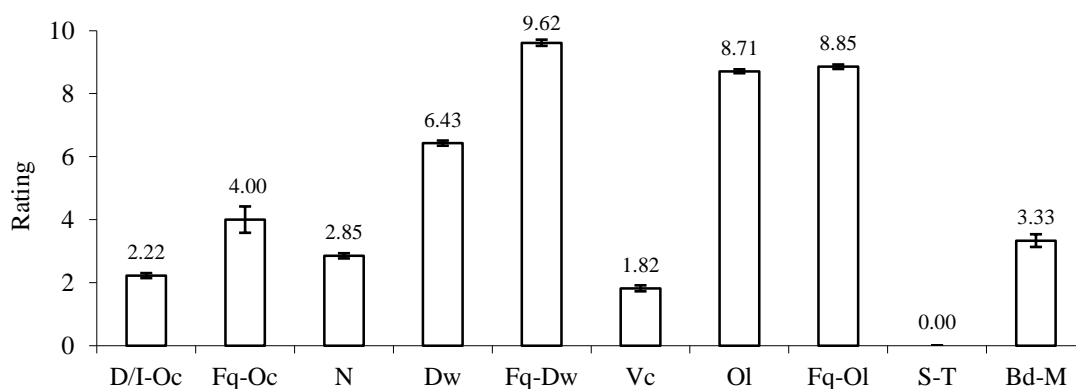
Health status and veterinary care

- Disease/injury occurrence was 81% (N = 26) with 14 having foot-related problems.
- De-worming was administered for 62% of the animals (N = 29) with mean frequency being 3.9 (SE = 1.21, N = 12). The drug used varied from allopathic to ayurvedic or locally prepared medicines.
- Vaccination was given to 24% of the animals with no records being available for 14% (N = 29).
- Oiling was done for 87% of the animals (N = 31) using castor, neem or coconut oil for the head or leg.
- No tests were done of dung/urine/blood samples for the six animals for which data is available.
- Veterinary doctors were available for 17 elephants. A veterinary doctor prescribed medicines for one female elephant without examining the animal.
- Of the 15 temples for which data is available, six doctors had previous experience in treating elephants with 57% of the doctors being on call.
- The distance to the temple from the doctor's place varied from 0.5 to 62.5 km for "on call" visits and 11 to 30 km for "monthly" visits.

The health of a captive elephant is considered to be among one of the indicators of its welfare. However, it should be noted that good health conditions do not guarantee good welfare status. Health status of elephants was rated using 10 sub-parameters (Figure 21). Low rating implies poor conditions of health maintenance. The overall

mean rating was 4.8 (SE = 1.13, N = 10) indicating poor health status. The same for individual elephants ranged from 0.17 (SE = 0.18, N = 6) to 9.0 (SE = 1.12, N = 5).

For individual mean rating for health status, only those animals for which at least five sub-parameters were rated have been considered. This is to ensure that at least a few direct health-related factors such as disease/injury occurrence/vaccination done/deworming done/ blood tests done, etc. have been rated. Otherwise, less significant parameters such as oiling and oiling frequency, vaccination frequency may influence the rating pattern leading to high scores.



D/I-Oc: Disease/Injury occurrence Fq-Oc: Frequency of occurrence of disease/injury
N: Nature of disease/injury Dw: De-worming done Fr-Dw: Frequency of de-worming
Vc: Vaccination done Ol: Oiling done Fq-Ol: Frequency of oiling
S-T: Blood/urine/dung sample tests done Bd-M: Body measurements taken

Figure 21: Ratings for health-related parameters for Captive elephants in temples of Karnataka

- One female, belonging to Sri Saundatti Yellamma Temple got an overall rating of 0.17 implying very poor maintenance of health.
- One female belonging to Nanjanagudu Temple got an overall rating of 9.0 implying near-ideal maintenance of health condition.

Distribution of ratings for health status of elephants in temples suggests 46% occurrence of values less than four (Figure 22).

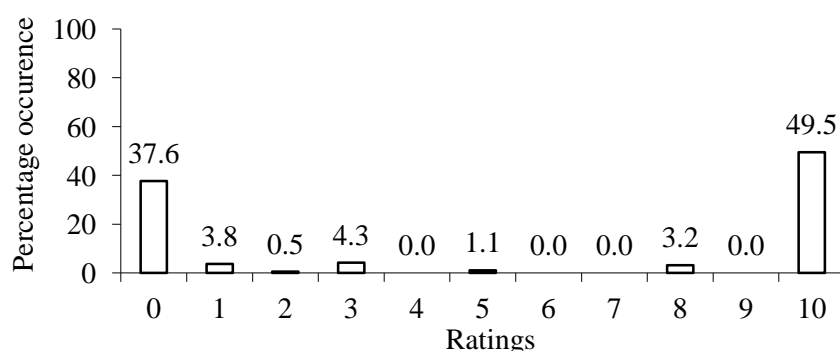


Figure 22: Distribution of ratings for health status of elephants in temples of Karnataka

Low rating for disease/ injury occurrence indicates occurrence of the same in the observed animals. Mean rating for disease/ injury occurrence was 2.22 (SE = 0.83, N = 27) with 78% of the animals reported to have experienced some disease/injury.

- Elephants which were free from disease/injury belonged to Sri Kollur Mookambika Temple, Sri Rambhapuri Mutt, Sri Krishna Temple, Udupi, Nanjanagodu Temple, Sri Kshetra, Dharmasthala and Sri Maralu Siddeshwara Temple.

Mean rating for nature of disease and injury was 2.85 (SE = 0.56, N = 20) implying occurrence of less-harmful/painful disease/injury but leading to health problems or being non-curable. Eighty-five percent of the sampled animals scored less than 3 for this parameter.

- One female elephant of Nanjanagodu Temple gets a rating of 0 as she is suffering from nail rot for the past three years with frequency of incidence being every month.
- One female elephant of Mukti Mandir Dharma Kshetra, Gadag and one female of Hombuja Jain Mutt got a rating of 8 as the injury is an old leg wound from chains and a muscle catch in the leg, respectively.

High rating implies adherence to the practice of de-worming the elephants. Mean rating for deworming of elephants was 6.43 (SE = 0.94, N = 28) with 64% of the elephants de-wormed at least once. Vaccination of captive elephants is an important practice as the animal is exposed to diseases from close contact with domestic animals. Mean rating was 1.82 (SE = 0.86, N = 22) implying poor adherence to the practice of vaccinating the animals with 82% of the sampled animals not being vaccinated. The health of an animal can be gauged by taking its morphometric measurements periodically. This practice was also rated. Mean rating was 3.33 (SE = 1.48, N = 12) implies poor adherence to the practice of taking body measurements. Availability of a veterinary care such as a doctor/assistant, doctor's experience with elephants, is a major factor in maintaining the health of an elephant. This parameter was rated across six sub-parameters (Figure 23). Overall mean rating was 5.64 (SE = 1.1, N = 6) with individual mean rating of each elephant varying from 0.0 to 10.0.

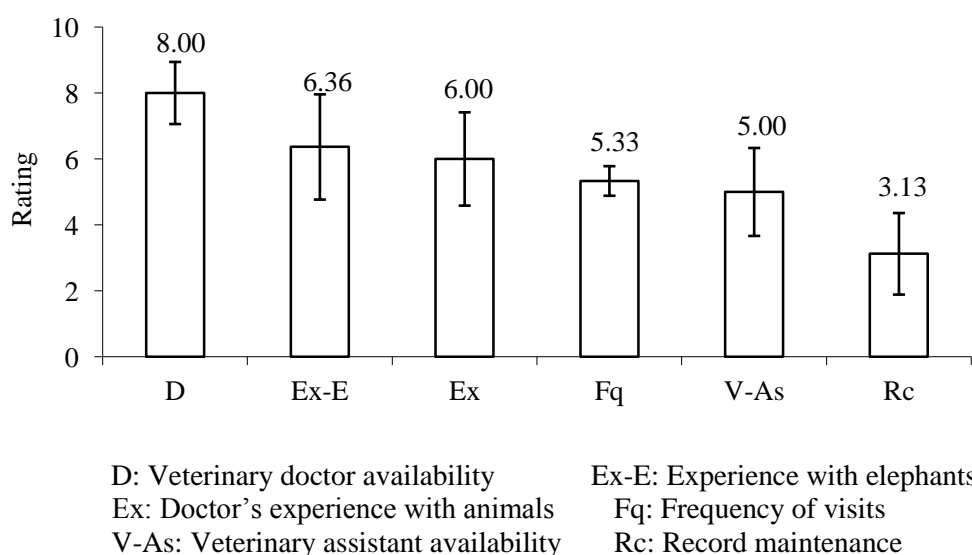


Figure 23: Ratings for veterinary care facilities for captive elephants of temples in Karnataka

Distribution of ratings for veterinary facilities suggests occurrence of 37% values with rating less than five (Figure 24).

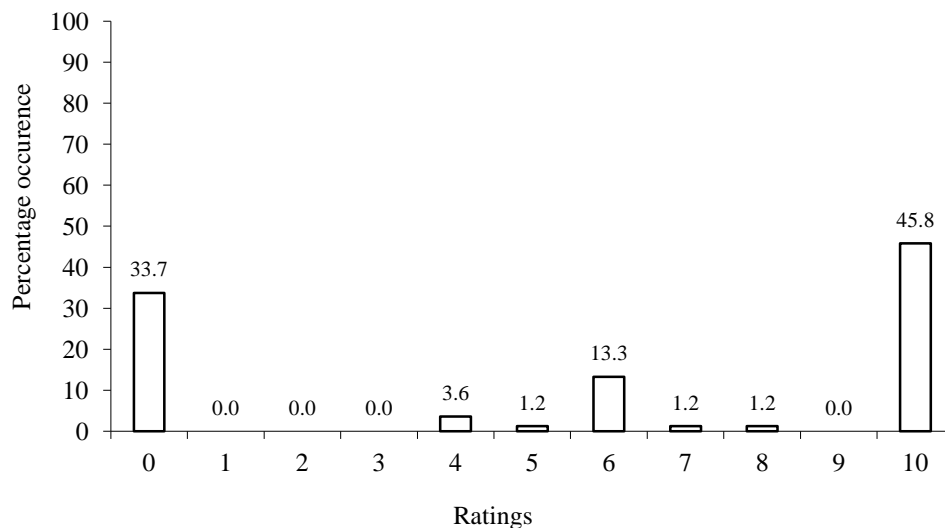


Figure 24: Distribution of ratings for veterinary facilities for captive elephants in temples of Karnataka

Mean rating for availability of veterinary doctor was 8.0 (SE = 0.94, N =20) implying a satisfactory status regarding the availability of veterinary doctor with 80% of the temples reporting availability. Experience in treating elephants has also been rated. A rating of 10 indicates experience in treating elephants. Mean rating of 6.4 (SE = 1.6, N = 11) implies availability of doctors with lesser experience in treating elephants. Sixty four percent of the temples reported veterinary doctors treating their elephant had experience with the animal.

Irrespective of the health of an animal, frequent visits by a doctor will help in maintaining an elephant's health and will assist in observing any abnormality in its health status. Mean rating for frequency of veterinary doctor's visit was 5.33 (SE = 0.45, N = 15) with all the places getting a rating less than 8 for this parameter.

- Fifty seven per cent of the temples reported that the doctors were on call with 14% reporting that the frequency was daily/ weekly.
- One elephant belonging to Kateel Sri Durga Parameshwari Temple, Mangalore, was given a rating of 0 indicating that the doctor had never visited the temple to check the elephant.

Status of infrastructure

- Staff quarters, including rented houses, were available for 95% of the temples. Elephant chains have a mean frequency of replacement of 0.5 /year (SE = 0.2, N = 16) ranging from 0 to 2 times per year.
- Mean number of managers per temple was 1.6 (SE = 0.42, N = 12) ranging from 1 to 5. Responsibility of the manager included maintenance of shelter, distribution of ration, and managing personnel.
- The mean number of mahouts available per temple is 1.1 (SE = 0.06, N = 22) ranging from 1 to 2.

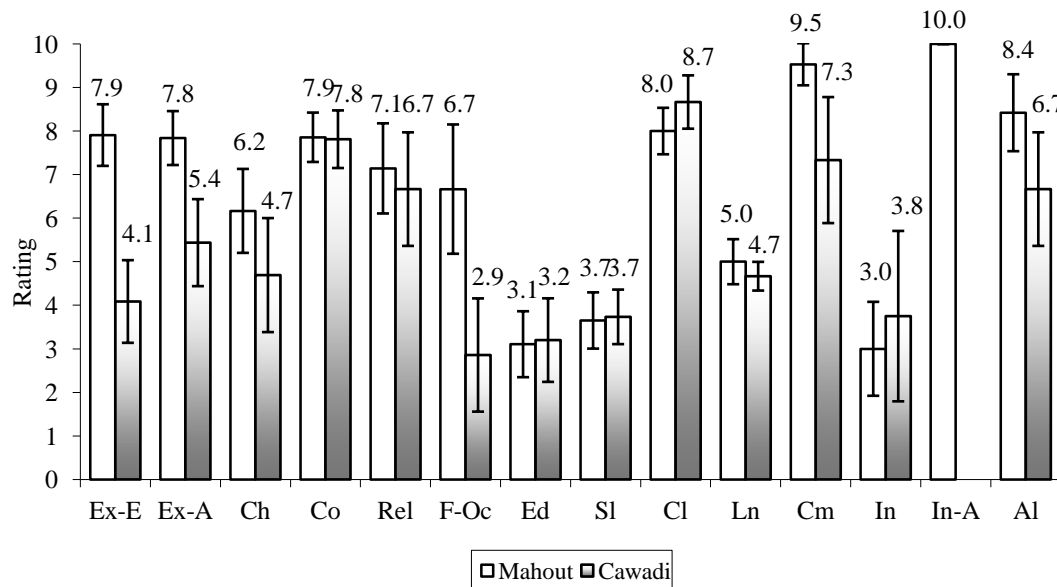
- There was no maintenance of records (service/clinical/medical) in 71% of the temples.
- Overall fund required per animal per year ranged from Rs.1,90,000/- to 3,00,000/-.
- Annual veterinary cost ranged from Rs. 10,000/- to 30,000/-. However, the above costs are based on data from 23 temples only. Mean annual cost for salaries is Rs. 54,371 (SE = 29, N = 7) ranging from Rs. 28,000/- to Rs. 1,00,000/.
- Lack of funds might induce elephant owners to move their animals frequently as may be the case for a female elephant of Mahalakshmi temple, Chippalkatti, Ramdurga taluk), an elephant shifted across towns every 34 months, according to her mahout.

Mahout/cawadi status

- The mean age for mahout in the temples observed was 35.4 yrs (SE=2.9, N = 21) ranging from 21 to 60 yrs, and for cawadi was 30.4 yrs (SE= 2.5, N = 16) ranging from 18 to 48 years.
- Mean experience as mahout was 20.8 yrs (SE= 2.8, N = 21) ranging from 0.5 to 45 yrs, while for cawadi it was 11.7 yrs (SE= 2.1, N = 15) ranging from 3 to 27yrs. Mahout experience with a particular animal is 10.8 yrs (SE= 1.9, N = 21) ranging from 0.5 to 35 yrs. Cawadi experience is 4.1 yrs (SE= 0.8, N = 16) ranging from 0.5 to 10 yrs.
- Only 33% percent of the mahouts (38% of cawadis) had joined the profession out of interest. Thirty nine percent (19% of cawadis) joined as it was an ancestral profession.
- Seventy two percent of mahouts (44% of cawadis) had received training in this profession.
- Only 13.6% of mahouts (13.3% of cawadis) were paid a salary in the range of Rs. 4000 to 5000/- p.m. Most (54%) were paid a salary of less than Rs. 2000/- p.m., while 60% of the cawadis were paid less than Rs. 2500/- p.m.
- The mean number of children per mahout was 3 (SE = 0.5, N = 17) ranging from 0 to 8, and for cawadi is 2.7 (SE = 0.5, N = 9) ranging from 1 to 5. The mahout/cawadi of elephant Indira (37.5 yrs, female) had reportedly appointed another person to take care of the animal at night.
- Many of the mahouts and cawadis did not have insurance of 20 mahouts, 70% did not have insurance cover, while 77% (N = 13) of cawadis were uninsured.
- Eighty-four percent (N = 19) of mahouts (67% of cawadis, N = 15) abstained from alcohol.
- Eighty one percent of the mahouts (92% of cawadis, N = 13) of a total of 21 interviewed did not have any regular medical check-ups/vaccination.
- All the mahouts (N = 21) used tools to control the elephant with 75% using both Ankush and stick. Each elephant had a mean of 2 mahouts (SE = 0.4, N = 15) ranging from 0 to 5 in number.

The welfare status of the mahout/cawadi was rated using a number of socio-economic parameters and experience with elephants. Poor socio-economic conditions of an animal handler might result in poor handling of the animal resulting in reduced welfare status of the elephant. The ratings are on the same scale of 0 to 10, with 0 indicating worse conditions and 10 implying the best possible situation.

The overall mean rating value for mahouts, assessed across 15 parameters (Figure 25), was 6.88 (SE = 0.6, N = 15) while it was 5.33 (SE = 0.5, N = 14) for cawadis. Their overall mean rating shows their welfare status (including their professional experience) to be moderate.



Ex-E: Experience with particular elephant Ex-A: Experience as % of his age
 Ch: Reason for choosing profession Co: Community of mahout/cawadi
 Rel: Relatives working as mahout/cawadi F-Oc: Family occupation
 Ed: Education level SL: Salary Ln: Languages known
 In: Insured In-A: Amount of insurance Al: Alcohol consumption

Figure 25: Ratings for mahouts in temples of Karnataka

The values for distribution of ratings for mahout welfare status shows occurrence of 55% ratings whose values are more than 7.0; the same for cawadi was 40% (Figure 26).

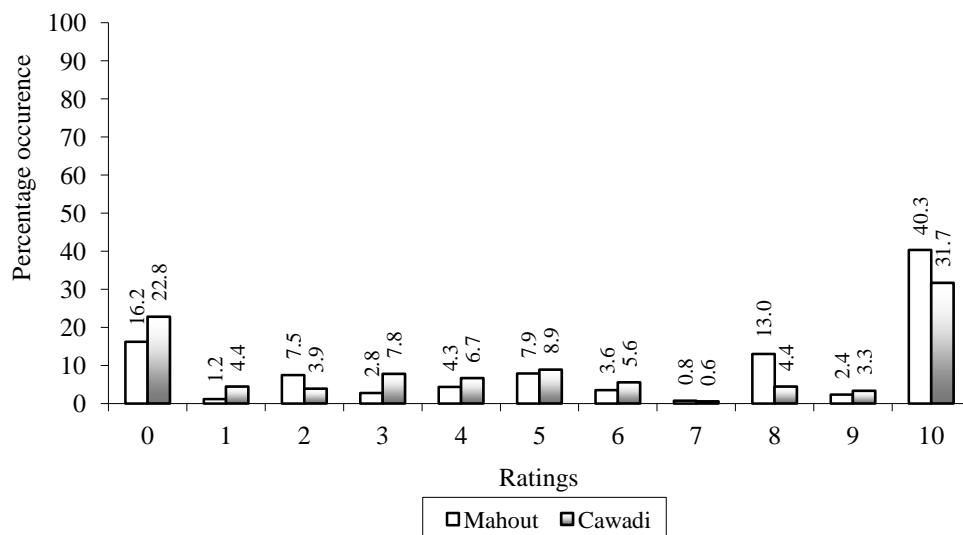


Figure 26: Distribution of ratings for mahout and cawadi welfare status in temples of Karnataka

The feature of experience of mahout/cawadi is meant to indicate the period spent with the particular animal. High rating shows longer duration with the animal. Longer duration with one particular animal is considered good as the animal and its handler learn about each other's ways. However, one disadvantage is ill-treatment by a handler which may result in conflict between the animal and the handler. Mean rating for mahout experience was 7.9 (SE = 0.7, N = 21) with 52% of mahouts getting a rating of 10 indicating duration with the animal which is > 50% of the elephant's age. Mean rating for cawadi was 4.1 (SE = 0.9, N = 16) with 19% of cawadis getting a rating of 10.

The mahout/cawadi's experience in the profession as percentage of his own age was rated. Mean rating for mahout was 7.8 (SE= 0.6, N = 21) implying professional experience of satisfactory nature. Forty eight percent of the mahouts were given a rating of 10 indicating experience of > 50 % (of his age) in the profession. Mean rating for cawadi was 5.4 (SE= 0.9, N = 15) showing moderate professional experience. Thirty three percent of the cawadis get a rating of 10.

High rating for the reason for choosing this profession implies choosing this profession on own volition and having been mahouts traditionally. Mean rating for mahout was 6.2 (SE= 0.9, N = 18) with 39% of the mahouts opting due to tradition only. Twenty eight percent were given a rating of 0 as they chose this as a way of employment; only one mahout chose out of interest and as a traditional means of employment. The mean rating for cawadi was 4.7 (SE= 1.3, N = 13) with 46% choosing only as a means of employment. However, 39% chose this purely out of interest.

High rating for income from this profession indicates a salary sufficient to support a family of four. Mean rating for mahout was 3.7 (SE = 0.7, N = 20) with 75% getting a salary < Rs.30,000/- per year. Only two of the mahouts interviewed got a salary of Rs. 60,000/- per year. The mean rating for cawadi was 3.7 (SE = 0.6, N = 15) with 67% getting a salary < Rs.30,000/- per year. Only two cawadis got a salary of Rs.50,000/- per year.

Alcohol consumption adversely affects the handlers' state of health and ability to interact with the animal. It may lead to ill-treatment of the elephant. Mean rating for mahout was 8.42 (SE = 0.9, N = 19) implying reduced occurrence of consumption of alcohol among the handlers. Eighty four percent of the mahouts did not consume alcohol. The mean rating for cawadis was 6.7 (SE = 1.3, N = 15) indicating moderate conditions for this feature. Sixty seven per cent of the cawadis were not consuming alcohol.

Overall welfare status of captive elephants in temples

The mean rating considering all the individual rating values across all the parameters studied was 4.18 (SE = 0.12, N = 1152). This implies poor state of welfare. Only 32% of the ratings ranged from 7.5 to 10.0 (Figure 27).

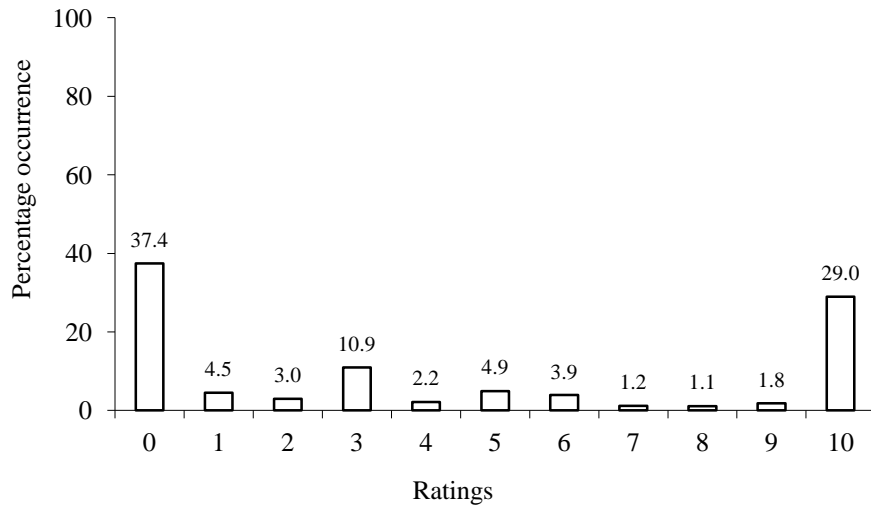


Figure 27: Distribution of overall rating for elephants in temples of Karnataka

Discussion

The ratings for assessing the welfare status of the elephants reflect deviations from the conditions experienced by the animal in the wild. Elephants, in the temples observed, for shelter status are given an overall rating of 3 implying adverse living conditions, and housing in restricted space with unsuitable substrates. Female Asian elephants in the wild range over an area of 34,800 sq m, while males range from 200 to 235 sq m (*Sukumar, 2003). Hard substrates lead to foot problems for the confined animals (Clubb and Mason, 2005, *Rajankutty, 2004). Keeping this in mind, the maintenance of elephants in small and unnatural conditions in temples makes it a significant factor contributing to reduced welfare.

The overall rating of 6.45 for water-related parameters suggests occurrence of tolerable conditions. However, when a parameter of basic importance such as the availability of running water is considered, 70% of the elephants were provided water from taps or non-flowing sources such as lakes or ponds. Tap water is not accessible to the elephant when it needs to drink and lakes/ponds are stagnant water-bodies. Related parameters such as bathing duration or quantity of water the animals drink per day depend on this unsuitable source of water.

The rating of 3.90 for sleep and related parameters implies poor conditions. This is mainly due to two factors: a) the sleeping place, and (b) the size of the place. The low rating for sleeping place and size is because of the concurrent use of the shelter as a sleeping place also.

Benz (2005) states that "...blood supply within the foot is of prime importance. Therefore, exercise and motion in captivity is not just essential for abrasion of the horn, but also for a better blood supply and therefore a better horn growth rate and horn quality". The elephants are allowed or made to walk for distances ranging from 1 to 30 km a day. However, the rating of 5.5 indicates moderate conditions with a need for improvement for walking conditions in terms of allowing the animal to range free and on suitable natural surfaces. The timing of the walk also needs to be changed to early morning or late evening hours.

The rating for social interaction among the elephants implies need for improvement. Thirteen elephants were not allowed any interaction at all and the mean number of animals was only two whereas a minimum of six individuals is considered a minimal group size replicating conditions in the wild. The need for a “family” environment is considered necessary for the growth and development of a young animal (*Sukumar, 1994). Kurt and *Garai (2001) suggest a link between young elephants lacking social interaction and expression of stereotypy by the animal.

The presence of unrelated animals in groups in temples may lead to aggressive interaction. This may be stressful for the animals considering the confined space within which they are housed. In the temples observed, the animals were housed within 40 ft of each other.

The rating for the temperament of the elephants in temples suggests a pliable behaviour of the captive animal. However, two factors need to be considered: a. occurrence of stereotypy, and b. aggression towards people.

a. Stereotypy: The occurrence of stereotypy in over half the number of elephants observed shows the need for urgent action in this aspect. Several factors have been studied and may cause the development of stereotypies in captive animals: restricted movement, improper housing conditions, social factors (Clubb and Mason, 2005). In this context, ratings for shelter and chaining of the animal, among the temples observed, are less than 3 implying poor conditions.

b. Aggression: Nearly 40% (N = 18) of the observed animals are rough and aggressive towards people. In some cases, it involved the death of the victim also. Of the five males observed in the temples, four were said to be rough/aggressive. Another male, was considered to be nervous. Data is available for one male regarding its behaviour during musth. This elephant was aggressive too. Also, during musth, the elephants were said to be chained and isolated.

All the observed elephants were given a rating of less than 3 for work type highlighting the unnatural and unsuitable work conditions for the animal. The mean work duration is only 2.8 h, but it involves such arduous tasks as standing on stone or concrete floor in front of temples, being exposed to the sun, blessing people (repetitive action causing strain to the trunk), begging for money or food, etc. None of these activities is part of an elephant’s natural way of life and involves a lot of training and forsaking of natural behaviours. Added to this, none of the elephants is allowed to range free, even at night, being chained for an average of 14.9 h a day. Work conditions need to be altered to provide for the expression of natural behaviour.

The practice of stall-feeding does not ensure the availability of the range of foods that an animal selects for itself while ranging free. Most of the temple elephants were given only stall food. Food also included, for some elephants, unsuitable items like idli and vada from hotels. Ration charts are not used. Right kind of food along with free-range browsing for the animal is important.

All the temple elephants observed were subjected to chaining with a majority being chained in more than one region. The mean rating of 0.02 implies need for some

corrective action. Studies show that chained animals may not get to spend time with their preferred partners (*Schmid, 1995), and there is higher incidence of stereotypy among such animals (*Gruber *et al.*, 2000, Schmid, 1995). Those that are chained overnight may have foot problems due to accumulation of dung and urine at the chaining place and arthritis due to restricted movement (*Galloway, 1991). Foot problems occurred in 14 of the elephants observed.

The mean rating for reproductive status of female elephants is less than 3 implying poor conditions in terms of number of females cycling or allowed to breed. The high incidence of acycling females, despite prevalence of adult female elephants, is by itself an indicator of poor welfare status. Adverse conditions such as transportation/harsh handling affect cycling in domestic animals (*Dobson and Smith, 1995, *Bearden and Fuquay, 2000). Poor conditions of captivity in “intensive systems” like temples may predispose the animal to acyclic nature (Kurt, 2005).

Disease or injury in 81% of the animals is compounded by the fact that the veterinary doctors are available for treatment “on call” for 57% of the animals. When this is viewed in terms of the distance to the doctor’s place (ranging from 0.5 to 62.5 km), treatment becomes an issue of importance. Physiological tests on blood/urine/dung were not done, maintenance of records was poor and body measurements were not taken regularly, if at all.

The socio-economic status as well as experience in the profession was assessed for the keepers of the elephants. The ratings for both mahouts and cawadis seem to indicate occurrence of poor conditions. Among the parameters rated, 50% of variables (for mahouts), 86% (for cawadis) score less than 8.0 implying need for improvement. Of this, 29% (mahouts and, 60% (cawadis) score less than 6, which shows the existence of moderate to poor conditions.

Some parameters that were given rating values less than 6:

- Both mahout and cawadi salary was given a rating less than 5 implying inadequate income for the keepers. The mean annual wage for the mahout is Rs. 23,260/- (ranging from Rs. 6000 to 72,000/-) with 64% earning in the range Rs. 10,000–30,000. When viewed in terms of number of children that the mahout had, which, on average, is three (ranging from 0 to 8), the salary seems to be insufficient to support a family.

The wage profile for cawadis is no different: mean annual salary was Rs 23,013/- (ranging from Rs.9600 to 48,000/-) with 60% earning in the range Rs. 10,000- 30,000. Cawadi families had a mean number of three children (ranging from 1 to 5).

- The score of 3 for insurance cover provided to the keeper highlights the poor conditions prevalent as far as financial security in the event of accident/ death of the keeper. Seventy percent of the employees were not covered by insurance. Coupled with this, 81% of mahouts and 92% of cawadis did not undergo any health check-ups. The check-ups are significant in the light of transmission of diseases such as tuberculosis across keeper and his animal (Anon., 2003, Cheeran 1997).

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Section 4:
Captive Elephants in Temples of Kerala

Executive summary

Elephants are currently being maintained in captivity for various reasons— religious significance, as a status symbol, etc. Of the captive elephant population, nearly 50% may belong to religious institutions. This population of captive elephants is subject to differing management and keeping conditions with negative consequences on the well-being of the animal.

The welfare status of elephants in temples of 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.

Two categories of temples were samples; category one, irrespective of the number of elephants maintained, each temple has been considered individually. Thus, the sample size will be $N = 21$. The category two; all the elephants, irrespective of their ownership to a temple have been considered together. Thus the sample size will be $N^a = 87$. The reason for this procedure is due to the unequal distribution of elephants among the temples observed.

Male elephants outnumbered females (Male: Female: 6.7:1.0). The number of elephants maintained ranged from 1- 60. All the observed elephants had undergone change in ownership as a result of being purchased/ transferred/ having been donated to different temples. Guruvayoor elephants were all donated by devotees. M-R was 1.5.

All temples had an open shelter. Mean area (inclusive of other elephants in each temple) was 0.037 Km^2 . Guruvayoor elephants had a mean area of 0.07 Km^2 . Mean area for each elephant (area where the elephant is tied/ kept) was 0.000032 Km^2 spending between 10 – 24 hrs a day within. M-R was 4.0 indicating a deviation of 50% from E-R

All the temples had access to water: most common source was well, followed by rivers, taps and ponds; in terms of temples: 45% used wells as water source, ponds were seen in 15% of the temples; 12 temples had more than one source of water. Distance to water source varied 3.3-102.8m (well), 25-5500m (river), 3.3-33.3m (tap) and 3.3- 91.4m (ponds). Bath frequency varied from daily to fortnightly with the bathing place being the tethering site, pond or river. Bath duration varied from 2-5h (considering all elephants together). M-R was 4 indicating a deviation of 50.3% from E-R.

In terms of number of temples, 76% did not provide for social interaction during off-season. Only 5% of elephants did not have provision for interaction while working. Duration ranged from 1-2 hrs to 20-24 hrs during off-season and the group size

ranged from 1 (off-season) to 1-20 (working). M-R was 4.5 indicating a deviation of 44% from E-R.

All elephants were chained in more than one region: leg-neck/ leg-body/ leg-body-hobbles. Chaining duration depended on whether the elephants were working or not: off-season duration ranged from 18-22 hrs (all elephants); while working, this duration ranged from 2-3 to 10-15 hrs. Fifty four percent of all elephants were shackled using hobbles. None of the elephants were allowed to free range at any time of the day. M-R was 1.2 indicating a deviation of 85% from E-R.

Sixty three percent of all elephants were described as quiet/ reliable and 27% were described as undependable/ agitated/ nervous. Forty eight percent of the elephants had injured/ killed public/ handlers. Fifty six percent of all elephants exhibited stereotypic behaviour such as body/ head swaying/ trunk biting, most were described as being of medium intensity. M-R was 4 indicating a deviation of 47% from E-R

All elephants were given only stall feed and the feeding place was the enclosure/ shelter (off-season) or any wayside place/ temporary camp-site while working. Food items given were: Coconut (*Cocos nucifera*) branches, Banana fruits/ plantain (*Musa* sp.) trunk, water melon (*Citrullus vulgaris*), rice (*Oryza* sp.), rice flakes, rice and turmeric (*Curcuma longa*), sugarcane (*Saccharum* sp.), Palm leaves (Family Arecaceae), *Caryota* palms; for Guruvayoor elephants: Rice, rice flakes, Banana, Green grass, Horse-gram (*Macrotyloma uniflorum*), Green-gram (*Vigna radiata*), Stem of plantain (banana) tree, dates (*Phoenix dactylifera*), Cucumber (*Cucumis sativus*), Watermelon, rice and turmeric (all the items listed were not given together). M-R was 2 showing a deviation of 78% from E-R

Only 10% temples were not using elephants for work. All the observed elephants were used for festivals/ temple rituals/ processions/ parades such as: “*Parayadi/ Paraeduppu, Aarattu, Ezhunnallippu and Procession (siveli), Vilakku-pooramu*”. Work duration ranged from 6-12 hrs— morning and night, 4 hrs (off-season).

Work period was during the festival season: with the elephants attending between 40-100 programs/ season located at a distance of 35-150 km, generating an income of Rs.1000-5000/festival. Mean duration an elephant was made to stand per festival was 3.9 hrs (day) and 3.5 hrs (night). The duration ranged from 1.5-5.5 hr (day) and 1.5-6.0 hrs (night). M-R was 3.0 (SE= 1.3, N*= 9) indicating a deviation of 63% from E-R

Data available for 2 female elephants suggests that both were exposed to males during festivals but were not given opportunity to breed. Except for one elephant (a 58y old male), musth reported for all males. Musth males were isolated/ watered/chained for the duration. Males in musth were reported to be aggressive towards handlers/ strangers. Post musth problems were seen through loss of body condition/ chain wounds caused by abrasion. M-R was 2 indicating a difference of 73% from E-R

Occurrence of wheezing, foot-rot, oozing of pus from trunk, colic, loss of vision and abrasion marks on legs were reported for the elephants. M-R was 3 indicating a deviation of 59% from E-R

All temples had access to a veterinary doctor with varied experience with elephants. Most doctors were on call or visited monthly, with one temple reporting daily visits by the doctor. Except two, all temples maintained records relating to health/ service/ clinic. M-R was 6 showing a deviation of 31% from E-R

Mean number of years of experience for elephant handlers in this profession was 14 yrs, ranging from 2-38 yrs. Thirty four percent of handlers were not trained, and 10% handlers' knowledge of commands was described as average, the rest were said to be good. M-R was 6 indicating a difference of 35% from E-R

Seventy percent of handlers had relatives in the same profession. Mean annual salary was Rs. 50,954/- ranging from Rs. 36,000/- to 84,000/-. 76% of handlers were said to consume alcohol, all after work hours. M-R was 5 with a deviation of 36% from E-R

Overall M-R was 3.3 showing a deviation of 59% from overall E-R implying, on an average, a difference of 60% would be noticed. Most occurrences were seen for maximum deviation (91-100%) from E-R.

Fifty five percent of the parameters showed a deviation of 50% or more from E-R implying absence of suitable features to this extent for more than half of the observed parameters. These parameters were spread across all the observed features: shelter/ water/ chaining/ physical exercise (walk)/ feeding/ work/ behaviour/ reproductive status and veterinary care.

Introduction

The practice of keeping elephants by temples may have begun as a suitable place to keep war elephants in between battles (Ghosh, 2005). Elephants owned and maintained by temples have outgrown this practice or the converse, i.e., using temple elephants in battles has also ceased; historically, the affluent of this region owned several elephants as a sign of prosperity. Unable to meet the rising cost of maintaining elephants, some of these animals were given to temples. Elephants are currently being maintained for various reasons— religious significance, as a status symbol, etc. This population of captive elephants is subject to differing management and living conditions with consequences on the well-being of the animal. Of the captive elephant population in Kerala, nearly 50% may belong to temples (Lair, 1997, citing Santiapillai).

Objective

Elephants and their handlers (mahouts/ cawadis) belonging to twenty-one temples in the state of Kerala were observed and data collected to:

- Assess the welfare status of elephants in temples in terms of the physical, social, physiological, psychological and health related features
- Assess the professional experience and socio-economic status of elephant handlers

Method

The association between elephants and people dates back several thousand years (Lair, 1997) but this contact has not resulted in domestication of elephants as the species has not been selectively bred in captivity, with new animals being caught from the wild. With this perspective, the welfare of captive elephants has been gauged by the deviation the animal experiences in its living conditions (physical and biological) in captivity. The greater the divergence from the wild, the lesser is the welfare.

Deviation from wild living conditions has been considered by assessing different features of captivity: physical space, social opportunities, opportunities for performance of species-typical behaviours, normal reproductive functioning among adults. Also, infrastructural features related to veterinary care availability have been considered as captive elephants may develop diseases/ disorders or may suffer from injuries/ wounds. Each of these aspects of captivity has been rated for its suitability to 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 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. 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 living conditions 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 a sub-parameter. In this report, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. Similarly for M-R also.
- 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 deviations from the prescribed norm. The graphs are based on ratings across temples (independent of number of elephants).
- Graphs depicting Percentage deviation from E-R for each observed parameter (sub-parameter) have been presented. These graphs depict deviation for each sub-parameter across all the temples (independent of number of elephants maintained).

N refers to number of temples observed.

N^a refers to number of elephants observed, across all the temples.

N* refers to number of sub-parameters observed for a parameter.

Result

Twenty-one temples were observed and relevant data was collected through observation and interview of concerned personnel. The results presented in the following pages are of two types:

- a. Irrespective of the number of elephants maintained, each temple has been considered individually. Thus, the sample size will be $N = 21$.
- b. All the elephants, irrespective of their temple, have been considered together. Thus the sample size will be $N^a = 87$.

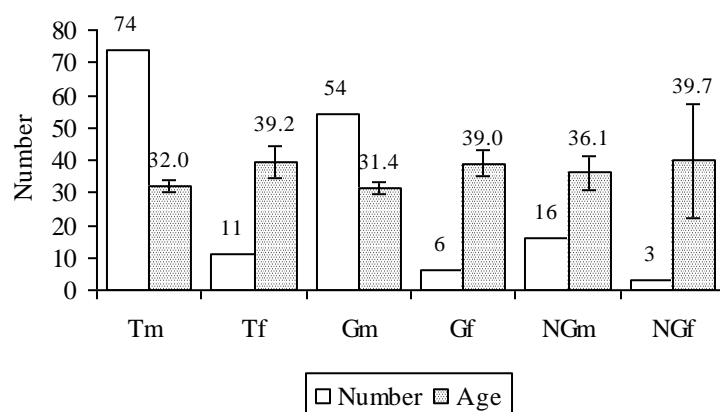
The reason for this procedure is due to the unequal distribution of elephants among the temples observed. Sixty-nine percent (60 in number) of all the elephants observed belong to the Guruvayoor temple. Hence, management and husbandry practices such as shelter/ drinking and bathing provisions/ food/ work type/ veterinary care availability will be influenced by the greater numbers of Guruvayoor elephants. Hence, for such features, individual temples ($N = 21$) have been considered and data presented. The sample size for Guruvayoor temple for each of the above parameters depended on the uniformity of ratings: when all 60 elephants scored the same for an observed feature, only one rating was taken as representative of the temple. When there were two sets of ratings, say, 5.0 and 4.5, distributed across the 60 elephants, one of each rating was selected.

For features related to intrinsic nature of elephants observed behaviour/ reproductive functioning/ quantity of water consumed/ sleep duration/ nature of disease and injury—the sample size of ($N^a = 87$), irrespective of ownership to a temple, has been considered. While each of these features may interact with captive conditions and provide a confounding picture, it is the characteristic of the elephant which is interacting with the surrounding conditions. Hence this has been considered the predominant aspect for rating. In addition to these features, chaining has been included in this category as aspects such as region/duration of chaining are dependent on the behaviour of the animal.

Male elephants outnumbered females (M:F; 6.7:1.0), with Guruvayoor temple having a ratio of M:F ; 8.6:1.0. The number of elephants maintained ranged from 1- 60 with a mode = 1.0. Figure 1 shows a predominance of males across all temples observed, irrespective of number of elephants maintained per temple. (The total number of elephants, $N^a = 85$, age was not known for two female elephants).

Overall age-sex distribution in temples

Figure 1 provides the details of overall distribution of captive elephants in temples that were sampled for the investigation. It is interesting to note that all temples have more males and both the sexes kept in the temple were adults



Tm: Total males Tf: Total females Gm: Guruvayoor males Gf: Guruvayoor females
NGm: Non-Guruvayoor males NGf: Non-Guruvayoor females

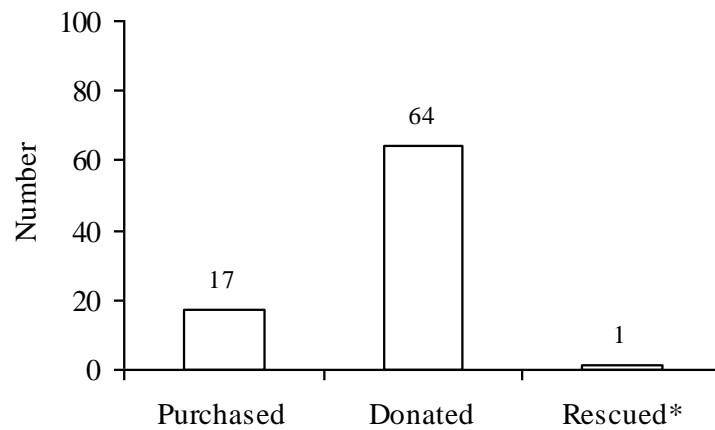
Figure 1: Age-sex distribution of elephants across observed temples

Source of elephant

Change in ownership may cause change in management schedule for the elephant. New locations, unfamiliar handlers, different keeping systems are potential stressors for animals. Kurt and Garai (2007) mention the incidence of stillbirth/ rejection among mothers which were weaned at an early age.

- All the observed elephants had undergone change in ownership as a result of being purchased/ transferred/ having been donated to different temples.
- Guruvayoor elephants were all donated by devotees.

M-R was 1.5 (SE= 0.02, $N^a = 82$). Figure 2 gives the nature of source elephants.



*: Rescued from a forest around 1936

Figure 2: Source of temple elephants

Shelter

Wild elephants have been observed to have home-ranges of 100-350km² (Poole and Taylor, 1999). They are known to traverse varied habitat, not restricting themselves to one place for more than several days (Shoshani and Eisenberg, 1982).

The observed temple elephants (irrespective of ownership) had the following provisions in their shelter:

- All temples (N=21) had an open shelter; 83% elephants had open shelter (N^a = 86; considering number of elephants irrespective of ownership)
- Mean area (inclusive of other elephants in each temple) was 0.037 Km² (N^a = 32), Guruvayoor elephants had a mean area of 0.07Km². Mean area for each elephant (area where the elephant is tied/ kept) was 0.000032 Km² spending between 10 – 24hrs a day within. Mean area for Guruvayoor elephants (area where the elephant is tied/ kept) was 0.00004 Km² within which it was kept for 16-20h/day during off-seasons (non-working period).
- 86% of temples (N= 21; irrespective of number of elephants maintained) had sand/ earthen floor, this value was 95% (N^a = 82) when number of elephants was considered irrespective of number of temples. Only three elephants had concrete flooring; all Guruvayoor elephants had earthen flooring
- Except one, all elephants had access to shade but of differing quality
- Shelter was cleaned daily or once in two days with stick, broom

M-R was 4.0 (SE= 1.3, N*= 8) indicating a deviation of 50% from E-R, considering temples only (irrespective of number of elephants held).

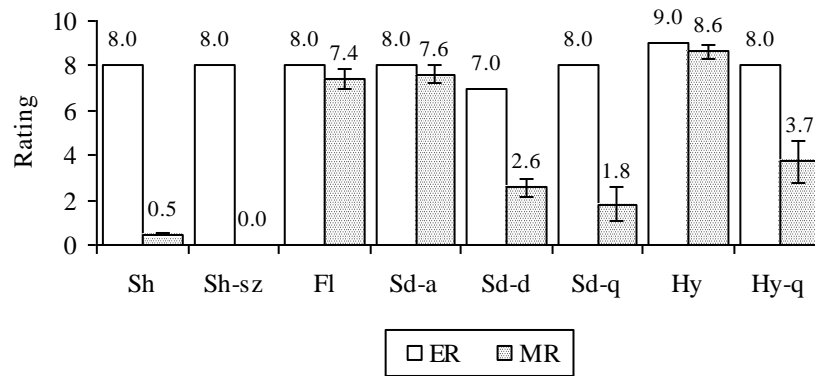


Figure 3: Comparison of E-R and M-R for 'shelter' sub-parameters

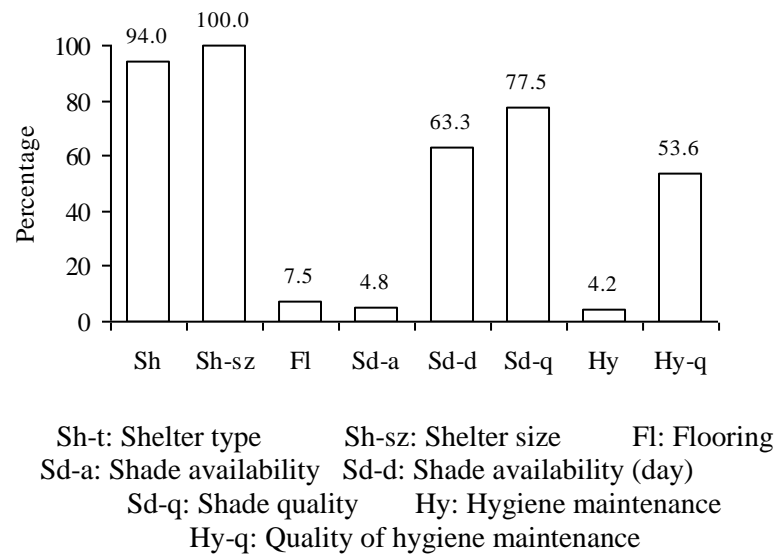


Figure 4: Percentage wise deviation from E-R for shelter

Water and related features

Water maybe important for elephants not only because of their need to drink, but also to engage in socializing behaviours around a water-source. In addition, bathing helps maintain body temperature during hot weather conditions (McKay, 1973).

This parameter has been assessed considering the temples (independent of number of elephants) for features which are external to the elephants and controlled by their handlers/ managers.

- a. Following features were provided for the observed elephants:
 - All the temples had access to water: most common source was well, followed by rivers, taps and ponds; in terms of temples: 45% used wells as water source, ponds were seen in 15% of the temples; 12 temples had more than one source of water, all Guruvayoor elephants had ponds as water-source mainly for bathing; in terms of number of elephants: 70% animals had ponds as water source, 15% wells and only 10% had rivers/ streams.

- Distance to water source varied 3.3-102.8m (well), 25-5500m (river), 3.3-33.3m (tap) and 3.3- 91.4m (ponds). For Guruvayoor elephants distance ranged from 5-250m.
- Water quality analysis was not done in any of the observed temples (N = 17).
- Bath frequency varied from daily to fortnightly with the bathing place being the tethering site, pond or river. The percentage of bathing frequency of once in two days was maximum across number of temples (56%) and number of elephants (85%) followed by daily baths (31%) and (10%) respectively. For Guruvayoor elephants, bathing place was the pond. Bathing was done using such scrubbing materials as coconut husk/ pumice stone/ ceramic stones
- Bath duration varied from 2-5h (considering all elephants together)

M-R for this parameter was 3.5 (SE = 1.01, N* = 6) for the temples observed—irrespective of number of elephants— indicating a deviation of 50.3% from E-R.

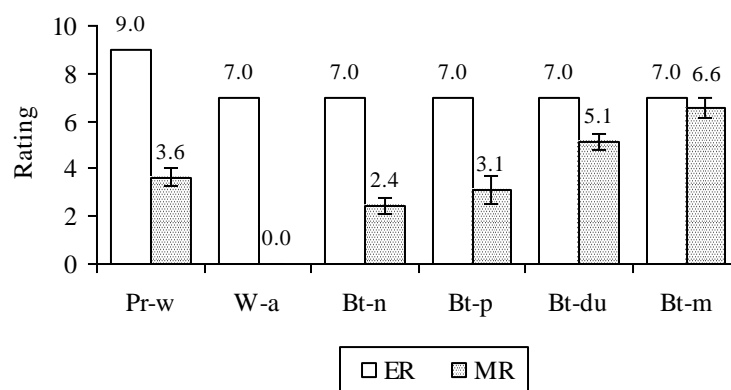
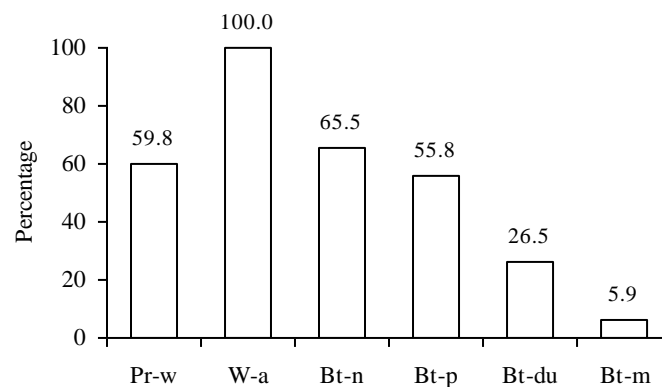


Figure 5: Comparison of E-R and M-R for ‘water’ sub-parameters



Pr-w: Availability of perennial source of running water

W-a: Water analysis, Bt-n: Number of times bathed

Bt-p: Bathing place, Bt-du: Bath duration Bt-m: Bathing materials

Figure 6: Percentage wise deviation from E-R for ‘water’ sub-parameters

Sleep

For their sleeping place, the elephants are dependent on the location provided by their handlers/ managers. Hence this aspect was rated across temples (N= 21), independent of the number of elephants maintained.

- Sleeping place across the observed temples was the tethering place/ enclosure when not working.
- While working, the place varied depending on the location.

M-R was 0.5 (SE = 0.04, N*=1) showing a deviation of 94% from E-R for this sub-parameter.

Sleep duration was considered across individual elephants:

- During off-season, when not working, duration ranged from 4-8h (N^a= 85)
- While working, duration ranged from 2-5h (N^a= 12)

M-R for duration (in shelter) was 6.5 (SE= 0.34, N= 85) showing a deviation of 19% from E-R. M-R for duration (working) was 5.7 (SE= 1.1, N= 12) with a deviation of 29% from E-R.

Walk

Owing to the nature of the work performed, temple elephants may be subjected to varying periods of walking. This may be on several kinds of substrates. This was rated across temples (irrespective of number of elephants).

- 50% (N= 70) of elephants (irrespective of number of temples) were not walked. For Guruvayoor elephants, 70% (N= 45) were not walked.
- In terms of number of temples, 18% (N= 22) did not provide opportunity to walk for its elephants.

M-R was 7.4 for opportunity to walk (SE= 0.8, N= 22) showing a deviation of 49% from E-R, based on number of temples only.

- Nature of terrain was tarred roads/ village roads/ mud roads for the temples observed

M-R was 1.8 (SE= 0.6, N= 13) indicating a deviation of 77% from E-R.

Social interaction

Opportunity for interaction with conspecifics includes number of individuals, distance between them and duration. Opportunity for social interaction is a consequence of the management practice adopted; hence, this was rated across number of temples observed.

- In terms of number of temples, 76% (N=21) did not provide for social interaction during off-season and only 5% did not have provision for interaction while working; in terms of number of elephants, 80% (N^a= 87) of all elephants had opportunity for interaction during off-season (with 69% of these elephants belonging to Guruvayoor temple)
- 99% of elephants (N^a= 67) were allowed interaction while working with 60% of these elephants belonging to Guruvayoor temple
- Duration ranged from 5-10h while working (festive season)
- Duration ranged from 1-2h to 20-24h during off-season

- Group size ranged from 1 (off-season) to 1-20 (working)

M-R was 4.5 (SE= 1.5, N*= 5) indicating a deviation of 44% from E-R considering across temples (irrespective of number of elephants maintained).

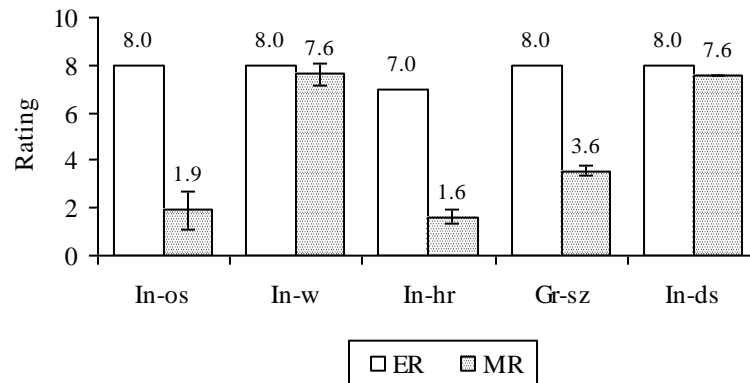
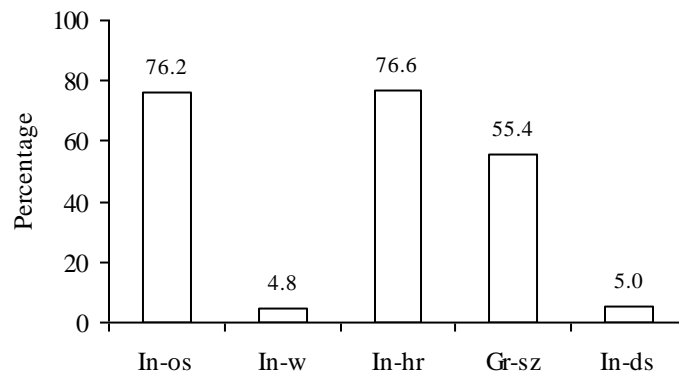


Figure 7: Comparison of E-R and M-R for ‘social interaction’ sub-parameters



In: Opportunity for interaction (off-season) In-w: Opportunity for interaction (working)
In-hr: Interaction hours Gr-sz: Group size In-ds: interaction distance

Figure 8: Percentage wise deviation from E-R for ‘water’ sub-parameters

Chaining

While space constraints and absence of natural boundaries may necessitate chaining of elephants, an equally important cause could be the temperament of the animal. Hence, this parameter has been considered across all observed elephants (independent of number of temples).

- All (100%) elephants were chained in more than one region: leg-neck/ leg-body/ leg-body-hobbles
- Mean chain weight was 11.5Kgs (leg), 12.8Kgs (body) and 7.9Kgs (hobbles); chain length was 4.9m (leg), 5.8m (body) and 2.9m (hobbles)— exclusive of Guruvayoor elephants
- Chaining duration depended on whether the elephants were working or not: off-season duration ranged from 18-22h (all elephants); while working this duration ranged from 2-3 to 10-15h (exclusive of Guruvayoor elephants).
- 54% of all elephants were shackled using hobbles, of which 67% were Guruvayoor elephants.
- None of the elephants were allowed to free range at any time of the day.

M-R for this parameter was 1.2 (SE= 0.8, N*= 7) considering all elephants (irrespective of number of temples). A deviation of 85% from E-R was observed.

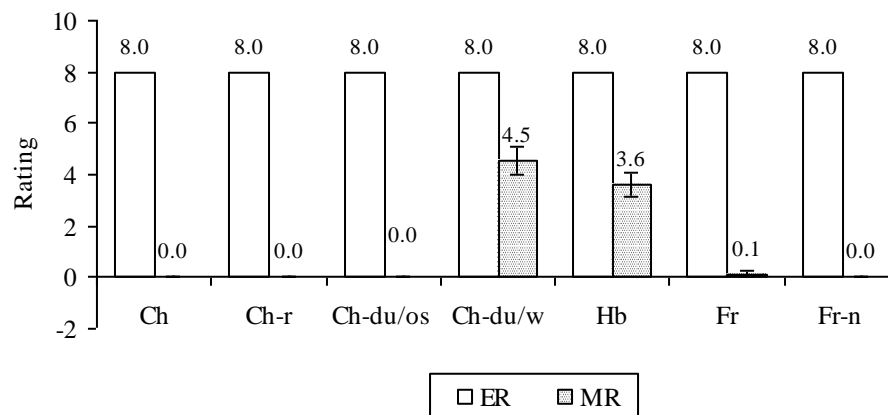
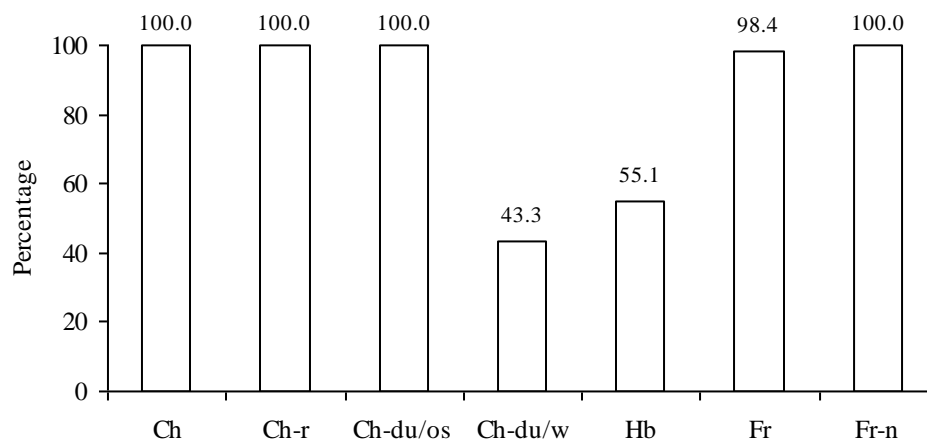


Figure 9: Comparison of E-R and M-R for 'chaining' sub-parameters



Ch: Chaining status Ch-r: Region of chaining Ch-du/os: Chaining duration (off-season)
 Ch-du/w: Chaining duration (working) Hb: Hobbling Fr: Opportunity for free-ranging
 Fr-n: Free-ranging at night

Figure 10: Percentage wise deviation from E-R for 'chaining' sub-parameters

Observed behaviour

Manageability of elephants was rated by considering its temperament, incidence of aggression. Occurrence of abnormal behaviours, stereotypy, was also rated. This parameter was rated by considering all elephants (independent of number of elephants maintained by each temple). Behaviour and related features can be considered to be an expression of interaction between the outside world and characteristic nature of each elephant. Since external environment has been considered separately, it is the individual characteristic which may be considered for rating for this parameter.

- 63% of all elephants were described as quiet/ reliable (n=23), of this, Guruvayoor elephants accounted for 33%.
- 27% were described as undependable/ agitated/ nervous (n=10).
- 48% (n=11) of the elephants had injured/ killed public/ handlers.

- 56% (n=13) of all elephants exhibited stereotypic behaviour such as body/ head swaying/ trunk biting, most were described as being of medium intensity “n” refers to actual number of elephants for which particular feature of interest was recorded.

M-R was 4.2 (SE= 0.6, N*=4) indicating a deviation of 47% from E-R for this parameter considering number of elephants, irrespective of number of temples.

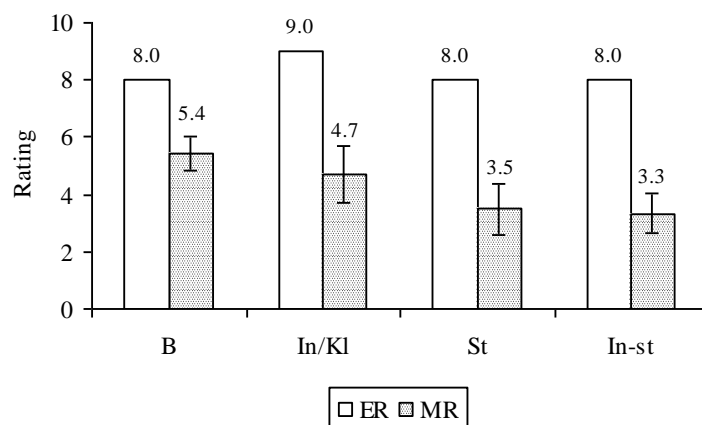
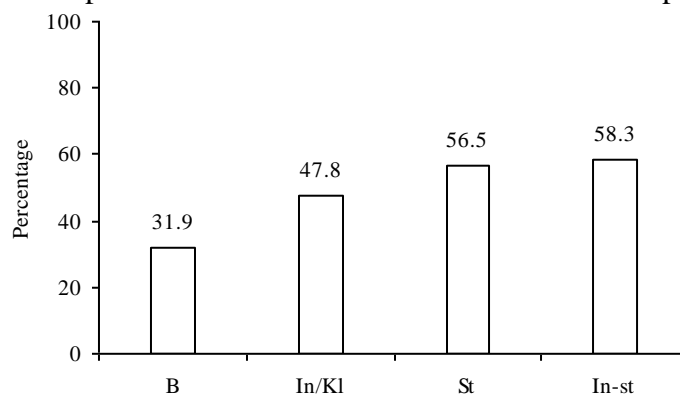


Figure 11: Comparison of E-R and M-R for ‘behaviour’ sub-parameters



B: Observed behaviour In/kl: Incidents of injury/ killing St: Stereotypic behaviour In-st: Intensity of stereotypy

Figure 12: Percentage wise deviation from E-R for ‘behaviour’ sub-parameters

Food

Food provisioning in the form of stall feed/ free-ranging opportunity is important keeping elephants’ behavioural biology in perspective. Along with this, husbandry practices such as number of food types given/ provision of supplements/ ration chart usage, have been rated.

- All (100%) elephants (N^a= 86) were given only stall feed
- Feeding place was the enclosure/ shelter (off-season) or any wayside place/ temporary camp-site while working
- 87% of the places were said to maintain good hygiene in the feeding place (of this, 68% was accounted by Guruvayoor elephants).
- Feeding duration ranged from 3.5-10.0h (working), 6-10h (off-season)/ 18-20 (off-season for Guruvayoor elephants)

- Food items given were: Coconut (*Cocos nucifera*) branches, Banana fruits/ plantain (*Musa* sp.) trunk, water melon (*Citrullus vulgaris*), rice (*Oryza* sp.), rice flakes, rice and turmeric (*Curcuma longa*), sugarcane (*Saccharum* sp.), Palm leaves (Family Arecaceae), *Caryota* palms; for Guruvayoor elephants: Rice, rice flakes, Banana, Green grass, Horse-gram (*Macrotyloma uniflorum*), Green-gram (*Vigna radiata*), Stem of plantain (banana) tree, dates (*Phoenix dactylifera*), Cucumber (*Cucumis sativus*), common salt, jaggery (unrefined sugar from sugarcane), Watermelon, rice and turmeric (all the items listed were not given together)
- Ration charts were not used for 27% (n= 16) of the observed elephants, while ration charts were used for all Guruvayoor elephants
- Mineral mix was not given for any of the observed elephants (n= 18), no data on Guruvayoor elephants
- 67% (n= 48) were given altered food during musth/ lactation, of this, 65% (n= 47) belonged to Guruvayoor.

“n” refers to actual number of elephants for which particular feature of interest was recorded. M-R was 1.8 (SE= 0.8, N*= 7) showing a deviation of 78% from E-R for this parameter across temples (irrespective of number of elephants maintained). Figures 13 and 14 show E-R and M-R for ‘food’ sub-parameters considering number of temples (irrespective of number of elephants maintained per temple).

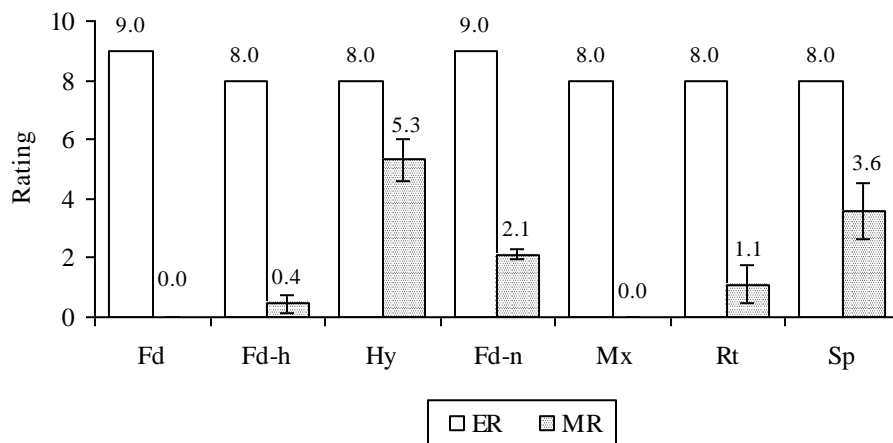
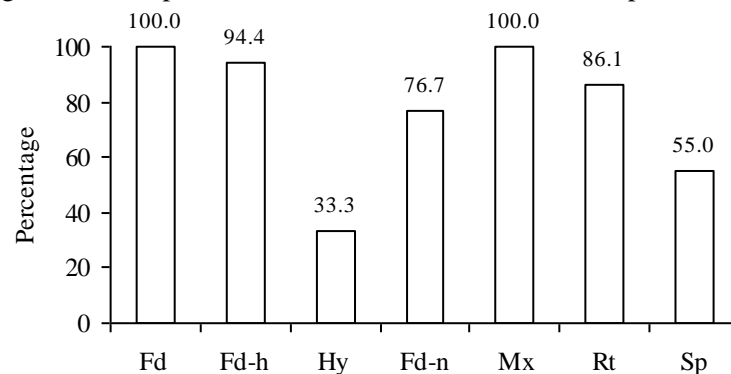


Figure 13: Comparison of E-R and M-R for ‘food’ sub-parameters



Fd: Food provisioning type Fd-h: Feeding hours Hy: Hygiene of feeding place
 Fd-n: Food types (Number), M-x: Provision of mineral mix Rt: Usage of ration chart
 Sp: Provision of special food during physiological changes

Figure 14: Percentage wise deviation from E-R for ‘food’ sub-parameters

Work

Purpose of keeping elephants and the work performed are closely linked: when elephants are kept for revenue generation, the work performed is generally un-natural to the elephant's normal behavioural repertoire. As this parameter is controlled by people and is external to the elephant, it has been rated considering the number of temples (independent of number of elephants maintained).

- Only 10% (N= 21) temples were not using elephants for work (either maintaining single / more than one elephant); 7% of the elephants (N^a= 84) were not used for work
- All the observed elephants were used for festivals/ temple rituals/ processions/ parades such as: “*Parayadi/Paraedupp, Aarattu, Ezhunnallippu and Procession (siveli), Vilakku-pooram*”
- Work duration ranged from 6-12h— morning and night, 4h (off-season); for Guruvayoor elephants, duration ranged from 8-10h (morning and night).
- Work period was during the festival season: with the elephants attending between 40-100 programs/ season located at a distance of 35-150Kms (Figure 15), generating an income of Rs.1000-5000/festival; Guruvayoor elephants worked between 5 to 15-20 days during the festival season
- Mean duration an elephant was made to stand per festival was 3.9h (day) and 3.5h (night). The duration ranged from 1.5-5.5h (day) and 1.5-6.0h (night). For Guruvayoor elephants, mean duration of standing was 4.6h (day, ranging from 1.5-5.5) and 4.3h (night, ranging from 2.5-5.5).

M-R was 3.0 (SE= 1.3, N*= 9) indicating a deviation of 63% from E-R (considering only temples and not the number of elephants maintained per temple). Figures 16 and 17 show comparative rating and Percentage wise deviation respectively, for this parameter.

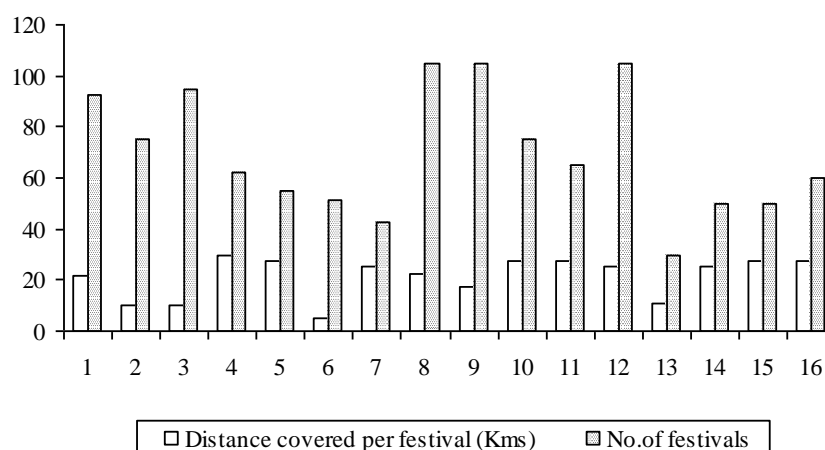


Figure 15: Distance covered by walking during the festival season (excluding Guruvayoor elephants)

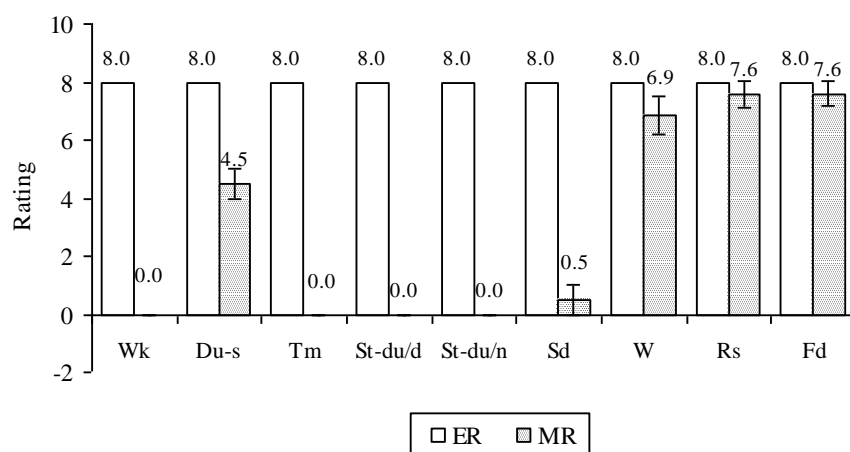
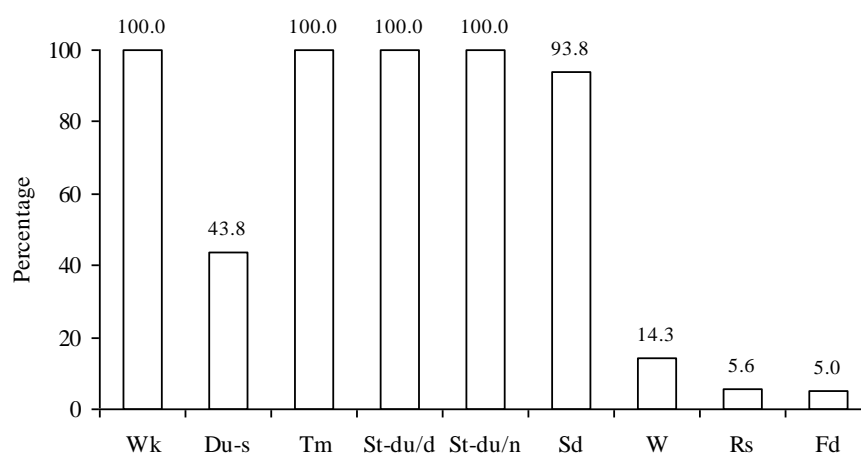


Figure 16: Comparison of E-R and M-R for work sub-parameters



Wk: Work type Du-s: Duration (Season) Tm: Work timing St-du/d: Standing duration (day)
 St-du/n: Standing duration (night) Sd: Shade availability during work
 W: Water availability during work Rs: Rest availability during work
 Fd: Food availability during work

Figure 17: Percentage wise deviation from E-R for work sub-parameters

Reproductive status

Unfavourable captive conditions such as absence of members of opposite sex/ restricted movement of animals/ absence of normal reproductive functioning among adult elephants lead to abnormal or no reproductive functioning. Additionally, absence of normal reproductive function could be associated with stress among the animals (Clubb and Mason, 2002).

- For the female elephants, data was available for only two: both were exposed to males during festivals, were not given opportunity to breed
- Except for one elephant (a 58y old male), musth for reported for all males.
- Musth males were isolated/ watered/chained for the duration
- Males in musth were reported to be aggressive towards handlers/ strangers
- Post musth problems were seen through loss of body condition/ chain wounds caused by abrasion

- 31% temples (N= 16) had male elephants that had not sired an offspring; in terms of number of elephants, 52% had not sired any offspring

M-R was 2.1 (SE= 1.0, N*= 8) indicating a difference of 73% from E-R considered across elephants, irrespective of number of temples.

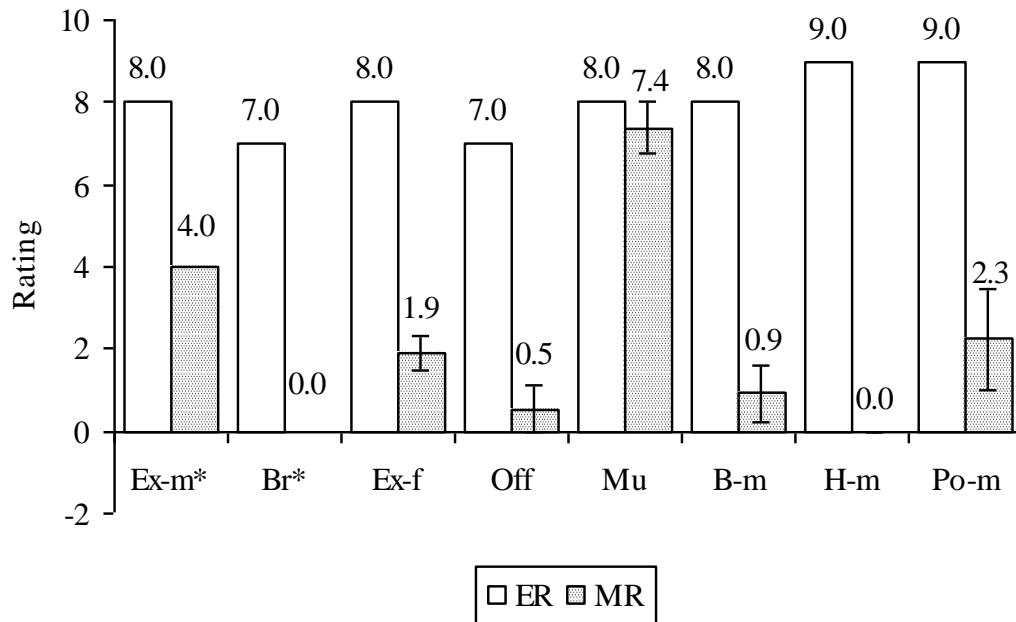
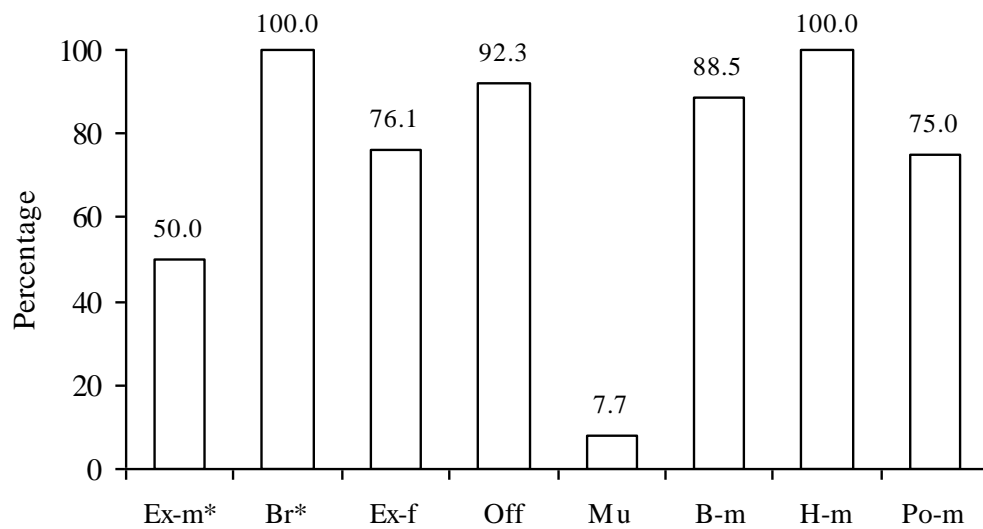


Figure 18: Comparison of E-R and M-R for 'reproductive status' sub-parameters



Ex-m: Exposure to males Br: Breeding opportunity Ex-f: Exposure to females
 Off: Offspring sired Mu: Occurrence of musth B-m: Behavioural changes during musth
 H-m: Handling of musth Po-m: Post musth problems
 *: observed for two elephants only

Figure 19: Percentage wise deviation from E-R for 'reproductive status' sub-parameters

Health and veterinary routine

Occurrence of disease/ injury pertains to the elephant; hence, this has been rated across elephants, irrespective of temples. Veterinary schedules such as deworming/ immunization, sample testing, etc., are dependent on the management of each temple, hence rating has been considered across temples (irrespective of number of elephants maintained by each).

- Occurrence of wheezing, foot-rot, oozing of pus from trunk, colic, loss of vision and abrasion marks on legs were reported for the elephants

M-R for nature of disease/ injury was 5.5 (SE= 0.7, N*=1) considering the number of elephants (N^a= 21) across all temples.

- 33% temples did not deworm their elephants; all temples did not practice immunization of at least some of their elephants; sample testing of dung/ urine/ blood was reported for only one temple; Body measurements of elephants were not taken in 38% of observed temples (N=16)

M-R was 2.9 (SE= 1.1, N*= 7) indicating a deviation of 59% from E-R, considering the temples (irrespective of number of elephants maintained).

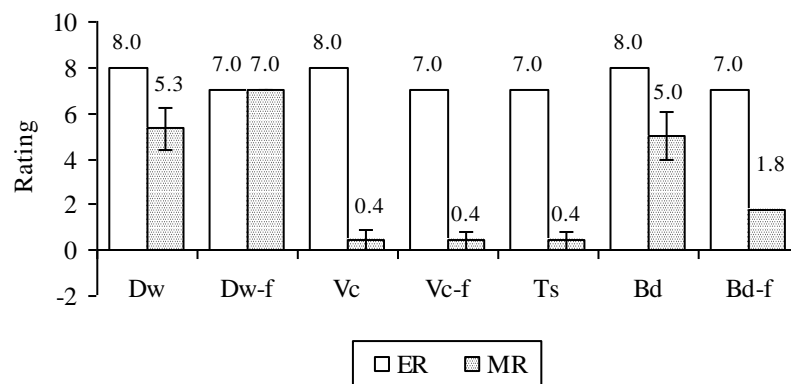
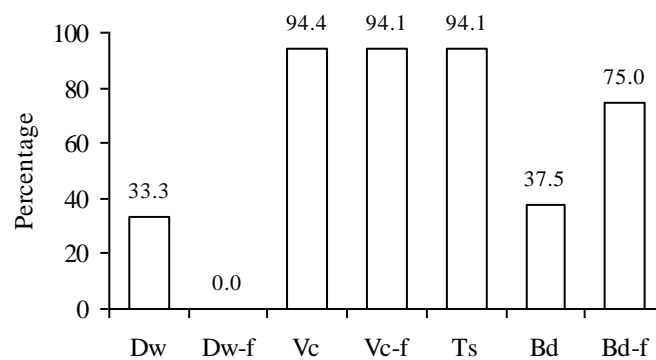


Figure 20: Comparison of E-R and M-R for ‘health and veterinary routine’ sub-parameters



Dw: Deworming done Dw-f: frequency of deworming Vc: Vaccination done
Vc-f: Vaccination frequency Ts: blood/ dung / urine sample tests
Bd: Body measurements taken Bd-f: Frequency of body measurements

Figure 21: Percentage wise deviation from E-R for ‘health and veterinary routine’ sub-parameters

Veterinary personnel and infrastructure

Availability of veterinary doctors with experience in treating elephants is important in health maintenance. This has to be coupled with the provision of suitable infrastructure. This parameter has been rated across temples (irrespective of the number of elephants maintained).

- All temples (N= 20) had access to a veterinary doctor with varied experience with elephants
- Most doctors were on call (N= 16) or visited monthly (N= 4), with one temple (Guruvayoor) reporting daily visits by the doctor
- Veterinary assistants were available for all temples
- Eight temples did not have veterinary clinic facility
- Facilities such as staff quarters/ cooking shed/ animals stand, etc varied across temples with five temples having only provision of staff quarters and elephant equipment such as chains
- Except two, all temples maintained records relating to health/ service/ clinic

M-R was 5.6 (SE= 0.9, N*= 8) showing a deviation of 31% from E-R considering only the temples, irrespective of number of elephants maintained.

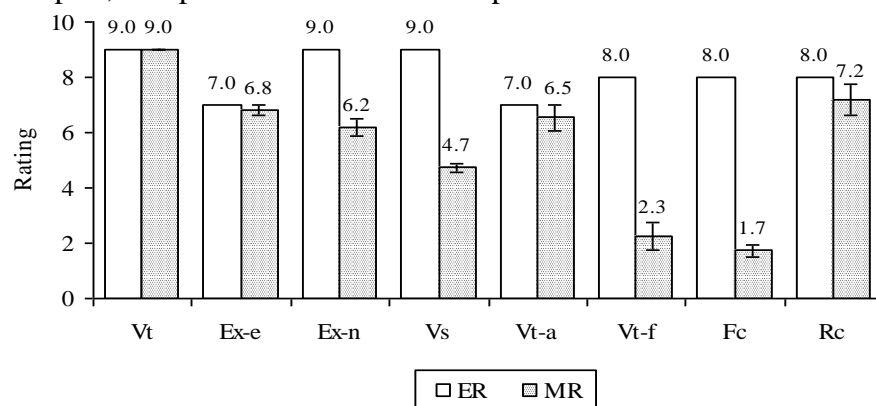
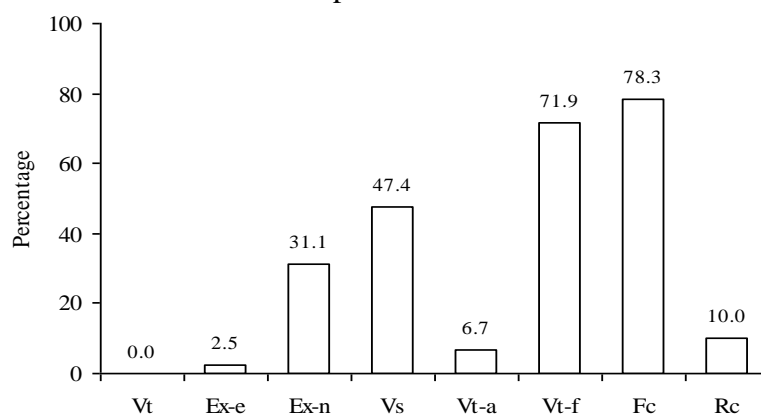


Figure 22: Comparison of E-R and M-R for 'veterinary personnel and infrastructure' sub-parameters



Vt: Availability of veterinary doctor Ex-e: Experience with elephants
 Ex-n: Number of years of experience Vs: Doctors visits
 Vt-a: Availability of veterinary assistant Vt-f: Veterinary clinic facility
 Fc: Other facilities Rc: Record keeping

Figure 23: Percentage wise deviation from E-R for 'veterinary personnel and infrastructure' sub-parameters

Professional experience and socio-economic status of mahouts/ cawadis

Data on 155 mahouts/ assistants was collected across the observed temples. Mean age was 39.8y (SE= 2.6, N= 17) ranging from 25-60y.

Professional experience

Absence of knowledge of elephants can be life-threatening to both handler and elephants. Hence, professional experience was rated based on number of years of experience with a specific elephant, whether the handler was trained/ not, presence of relatives in the same field.

- Mean number of years of experience in this profession was 13.9y (SE= 0.8, N= 121) ranging from 2-38y. Figure 24 compares the number of years of experience of handlers across all temples with those of Guruvayoor handlers.
- Reason for a mahout working with more than one elephant varied: the handler was shifted to another elephant, handler left job because of low salary, elephant was sold or handler was suspended
- 34% of handlers were not trained
- Handlers' knowledge of commands was described as average for only 10% of mahouts/cawadies, the rest were said to be good
- Mean hours spent with elephant while working was 17h (SE= 2.9, N= 6) while this duration during off-season was 6.4 (SE= 0.1, N= 107)

M-R was 5.9 (SE= 1.1, N*= 5) indicating a difference of 35% from E-R considering all handlers (irrespective of number of temples).

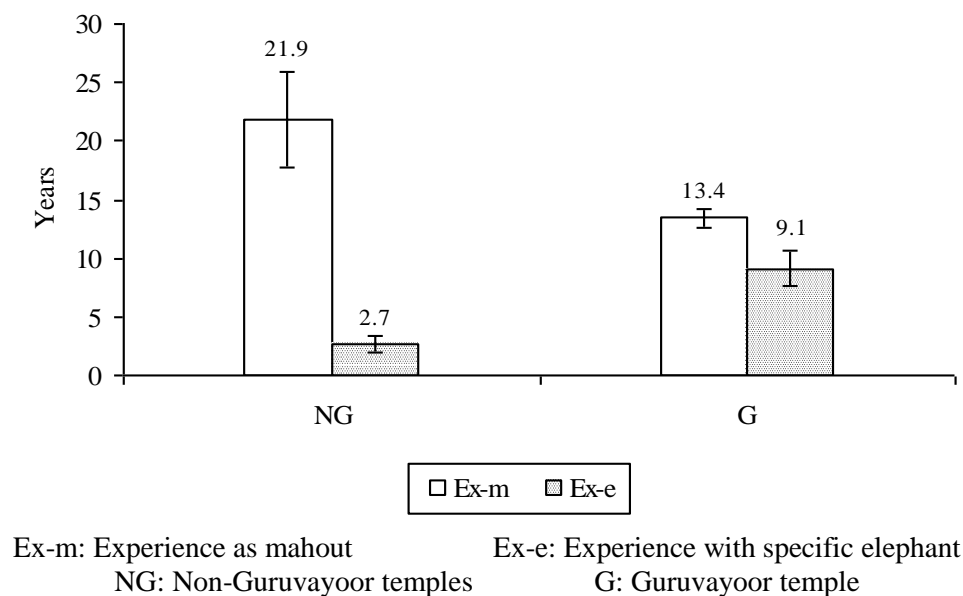


Figure 25: Comparison of mean years of experience of handlers

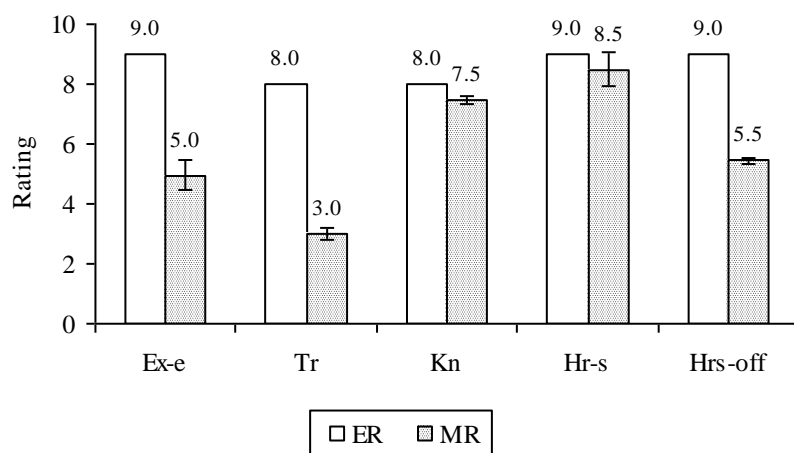
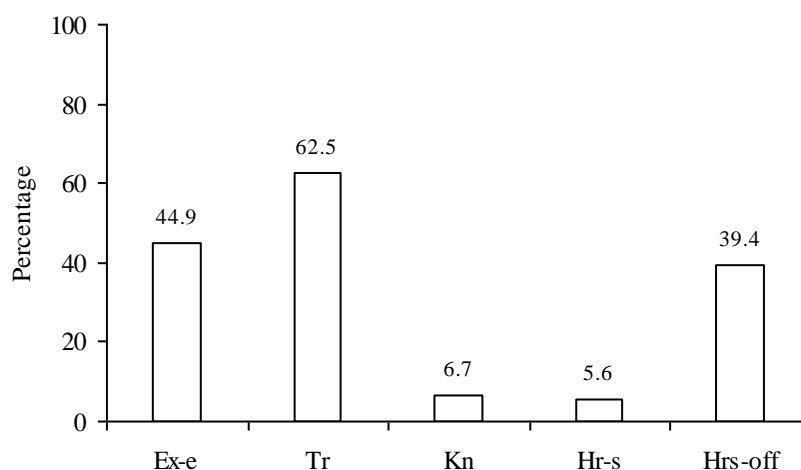


Figure 26: Comparison of rating for 'handlers' professional experience' sub-parameters



Ex-e: Experience (as % of elephant age) Tr: Training status
 Kn: Knowledge of commands Hr-s: Hours spent with elephant (while working)
 Hrs-off: Hours spent with elephant during off-season

Figure 27: Percentage wise deviation from E-R for 'handlers' professional experience' sub-parameters

Socio-economic status

Handlers' economic and social profile is an important indicator of his/ her welfare status. Poor social security may lead to improper handling of elephants and poor efficiency of work.

- 70% of handlers (N = 13) had relatives in the same profession, 50% (N= 16) reported a family occupation not associated with handling elephants
- Education status ranged from 5th to pre-graduate level; all were literate
- Mean annual salary was Rs. 50,954/- ranging from Rs. 36,000/- to 84,000/-
- Number of children per family ranged from 0 to 4
- 7% of handlers were not covered by insurance; those with insurance cover, working for Guruvayoor temple, were provided by the temple itself
- 76% of handlers were said to consume alcohol, all after work hours

M-R was 4.5 (SE= 0.7, N*= 9) with a deviation of 36% from E-R, considering all handlers (irrespective of number of temples).

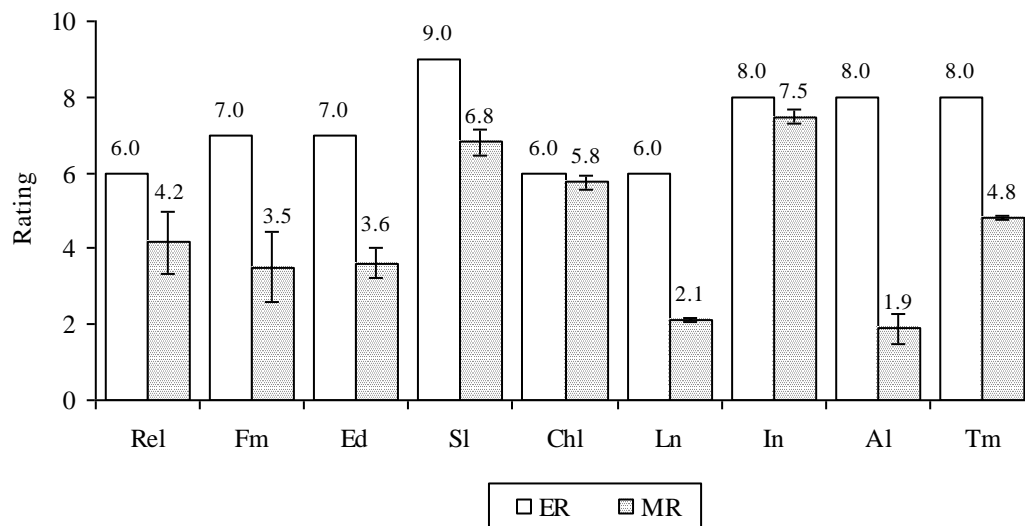
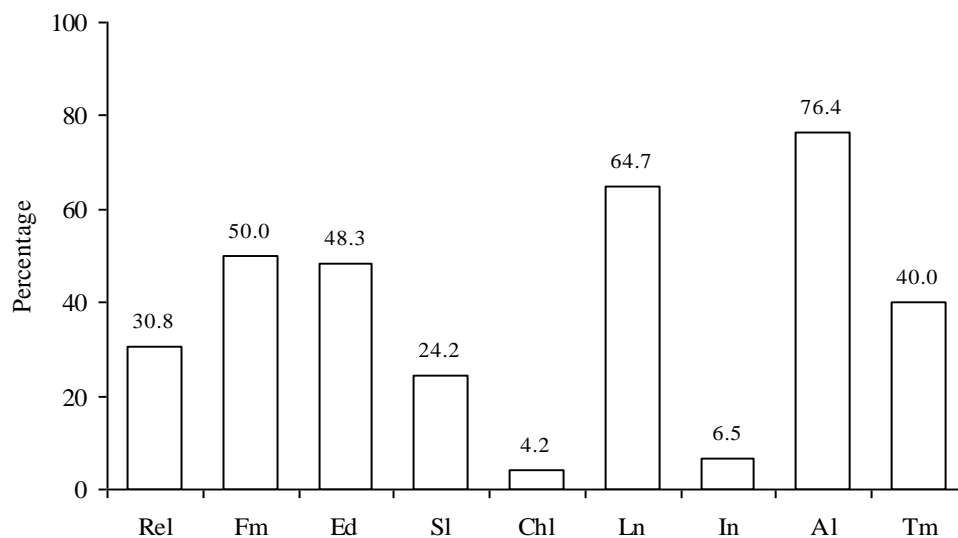


Figure 28: Comparison of rating for ‘handlers’ socio-economic status’ sub-parameters



Rel: Relatives as handlers Fam: Family occupation Edu: Education status
 Sal: Salary drawn Chl: Number of children Ln: Languages known
 In: Insurance availability Al: Alcohol consumption
 Tm: Timings of consumption

Figure 29: Percentage wise deviation from E-R for ‘handlers’ socio-economic status’ sub-parameters

Overall Welfare Status

Overall M-R was 3.3 (SE= 0.3, N*= 76) showing a deviation of 59% from overall E-R implying, on an average, a difference of 60% would be noticed. Figure 24 gives the distribution of Percentage wise deviation for the observed parameters. Most occurrences were seen for maximum deviation (91-100%) from E-R. 55% of the parameters (N= 76) showed a deviation of 50% or more from E-R implying absence of suitable features to this extent for more than half of the observed parameters. These parameters were spread across all the observed features: shelter/ water/ chaining/

physical exercise (walk)/ feeding/ work/ behaviour/ reproductive status and veterinary care.

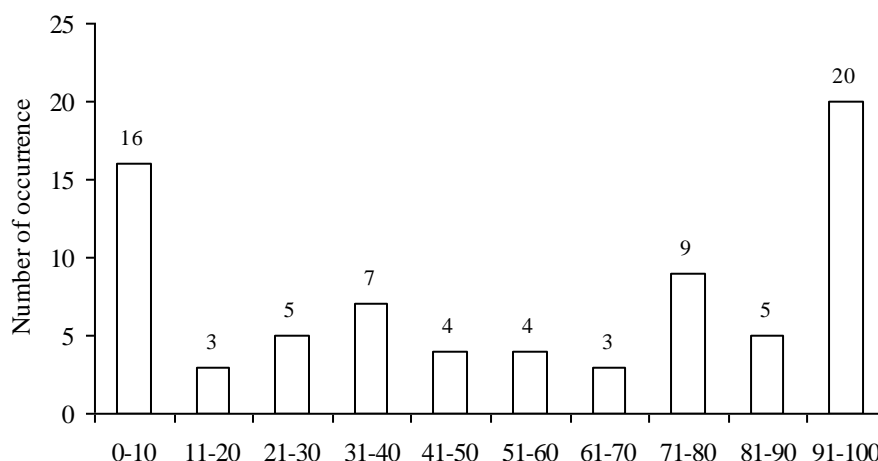


Figure 24: Distribution of deviation from E-R for the observed parameters

Discussion

The distribution of elephants across temples was uneven with the Guruvayoor temple accounting for 69% of the elephants observed. Excluding this temple, the number of elephants per temple ranged from 1 to 7. Hence, the results presented here represent mean rating obtained by a combination of means across temples (independent of number of elephants held) and across all elephants (irrespective of each temple).

Features showing deviation of more than 50% from E-R:

- One common aspect of 99.9% of the observed elephants was their source: all were purchased/ donated to the temple. Their previous history was not known. Despite this, it is clear that the animals undergo change in their ownership and a consequent change in their living conditions. This itself can be a source of stress for the elephants as new daily routines maybe introduced/ changed, different handlers may be involved in caring for the animal— the number of elephants each mahout had worked with ranged from 1-31.

Absence of natural conditions:

- Studies on wild elephants have shown the distances traveled as they forage across varied habitat for 12-18h / day (Poole and Granli, 2009; Sukumar, 2006). All observed temple elephants were confined to their open shelters for at least 16h/day when not working.
- A feature affecting all aspects of the elephant's life was chaining: the elephants were chained for at least 70% of a day (when not working). This ensured inaccessibility of essential features to the animal— water when it needed to drink/bathe/ movement from its place of confinement/ interaction through physical contact with conspecifics. Chaining ensured loss of opportunity to perform behaviours that would provide physical/ psychological stimulation to the animal; the elephants were also reported to exhibit stereotypic behaviours. Gruber et al., (2000) report increased incidence of stereotypy among chained elephants as compared to those that were penned.

- Most elephants were provided water through ponds/ wells. This meant inaccessibility when the elephant needed to drink/ bathe; species-typical behaviours such as dust bath/ wallow could not be performed
- None of the elephants were allowed to forage: all were provided only stall feed. This restricted the number of food plants available to the animal; opportunity to engage in the dominant activity observed for wild elephants— foraging— was thus absent.
- The work performed defined all aspects of the elephants’ life— depending on the schedule of work, facilities were provided to elephants. For durations ranging from 25-50% of a day, the elephants were made to participate in different festivals, having to cover the distance between these locations either by walk/ other forms of transport. Thus, feeding/ resting/ sleeping/ bathing/ social interaction were all subject to this schedule during working season. Work involved standing in one place for a mean duration of 4h during the day and at night. Poole and Granli (2009) state wild elephants spend around 5% of daylight hours standing (this includes comfort activities/ drinking). This implies a maximum of one hour of standing as an activity by itself. Thus, the temple elephants were made to engage in this activity eight times more than the maximum observed for their wild counterparts. This activity, it should be noted, was repeated for the entire working season, lasting from November to May.
- Reproductive status of the elephants was marked by lack of opportunity: either due to absence of individuals of opposite sex/ or by restricted movement due to chaining; males had not sired offspring despite their physiological maturity

Veterinary procedures

- Practice such as deworming/ immunization/ sample testing were not followed systematically; immunization or its absence was compounded by the fact that owners/mahouts do not consider inoculation against tetanus as “immunization”. Thus, absence of the practice of vaccination may imply immunization against tetanus is done.

Handlers’ status:

- Despite the established history of elephant keeping in Kerala, 50% of the interviewed mahouts/ cawadis, for the temples observed, came from a family background not associated with handling elephants. This implies new entrants into this profession and older, trained handlers’ offspring not opting for the profession
- Correspondingly, mean years of experience in the profession was only 20y (exclusive of Guruvayoor temple) and 13y for Guruvayoor elephant handlers.
- Nearly 50% of observed elephants were reported to have killed/ injured handlers/ public, males were aggressive towards handlers while in musth: features that make this profession dangerous to both elephant and handler.
- Alcohol consumption was prevalent among all the handlers

Comparison between observed temples and Guruvayoor temple elephants:

- a. Open type shelter for all temples with earthen flooring
- b. Wells, taps, ponds, rivers/ streams as water source for use by elephants; Guruvayoor elephants – pond water

- c. Only three elephants belonging to different temples not walked; 70% elephants of Guruvayoor temple not walked
- d. Five temples provided for social interaction when not working; all Guruvayoor elephants had opportunity for interaction but restricted by chaining for 16-20h
- e. No difference between elephants in food provisioning type
- f. All elephants used for temple rituals/ processions/ festivals

Observations on handlers/ owners/ managers associated with temples:

- This management regime appears to have inexperienced owners/ managers with poor knowledge of elephants
- Non-observance of customs or traditions associated with elephant keeping in Kerala
- Political interference in mahout management
- Improper methodology of mahout selection

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Section 5:
Captive Elephants in Temples of Maharashtra

Executive summary

Elephants maintained in five temples in different districts of Maharashtra were observed and data was collected to assess the welfare status of its captive elephant/s and elephant handlers.

Data was collected through observation and interview of personnel/ management. Each of the parameter observed has been rated on a zero to ten scale with zero representing the worst possible situation and ten implying a satisfactory state, closer to what an animal experiences in the wild.

Ratings were graded in the following manner:

- 0 – 2.4: Bad conditions
- 2.5 – 4.9: poor
- 5.0 – 7.4: moderate
- 7.5 – 10.0: satisfactory

Mean age of the animal observed was 32.6 yrs. with age ranging from 14 – 70 yrs. for the four males. The single female was aged 21 yrs. Two males were purchased from Sonepur Mela, Bihar male, 70 yrs was purchased from Sadhu Maharaj, Ujjain, Ujjain Math in 1964-1965 male, 20 yrs was purchased from Forest office-Moolehole-Bandipur, Karnataka in 1993, male, 38 yrs, and the female, 21 yrs was gifted by Shimoga Mutt, Karnataka. Mean ratings for source of animal was 2.5 showing movement across facilities as a consequence of being purchased/ sold.

All the observed elephants were said to be kept for religious purpose. Mean rating was 0.0. The elephants were kept in man-made enclosures: ranging from aluminum tents to RCC sheds. Stone and concrete flooring was available for four elephants, while it was earthen for a female. Mean rating for shelter was 2.8 implying existence of poor conditions.

Source of water for all animals was tap water, lake water available for one male, river water available for male, and mean bath duration was 1.3 h. Mean ratings for water related parameter was 4.1 with 71 % of the all the rating getting a score less than five, showing occurrence of poor conditions

The opportunity provided to elephants allowed to interact among others to express species-specific behaviour was rated. Mean rating was 2.5 with only two animals said to be allowed interaction opportunity occasionally. All the elephants were chained; spiked chain was used for a male and a female. Mean rating for chaining related parameter was 0.0 implying occurrence of bad conditions.

All the elephants were used for temple related work, a female and a male were hired for marriage functions and the male was also hired for a film. Mean ratings for work related parameter was 4.2 implying poor conditions.

All the elephants were given only stall feed, feeding area was shelter or while walking. Food types were dry grass, crops, fruits, sugarcane, Vaidan, Wheat roti, Rice, Kadba Grass, Usa, Pend-wet, Fruits & vegetables, and the source of food was purchased from market; and a male obtained while begging. Mean ratings for food related parameter was 1.2.

All the animals were said to be reproductively active by exhibiting musth (for males) and oestrus cycles (female). None of the four observed elephants were exposed to members of opposite sex. Mean rating for reproduction related parameter was 3.3 showing existence of poor reproductive and related conditions

Symptoms of paralysis, partial blindness in one eye, toe nail cracks, sneezing, Diarrhoea are some of the health problems observed for the animals studied. Mean rating for health related issues were 3.6 with 65 % of all rating getting a score less than three.

All the elephants had one mahout each, mean age of mahouts was 31.8 yrs and mean experience in the profession was 19.2 yrs. Mean salary per year was Rs.32, 400/- ranging from Rs.12, 000 to 60,000/- and mean number of elephants each mahout had worked with: 6.0. Overall mean rating for handlers was 6.3 considered across individual rating for all the parameters.

Overall mean rating for elephant welfare status in temples was 3.6 indicating occurrence of poor conditions. Sixty-two percent of the values were given a rating less than four.

Introduction

Maintenance of elephants by temples has a long history. However, this practice needs a critical study in terms of the conditions experienced by the animals as a consequence of the living environment imposed on them. The complex lives that wild elephants experience in terms of ecological variability and social environment may be hard to duplicate in captivity in temples.

Objective

Elephants maintained in five temples in different districts of Maharashtra were observed and data was collected to:

- Assess the welfare status of its captive elephant/s
- Assess the welfare status of elephant handlers

Method

Five elephants, belonging to different temples in Maharashtra were observed and data collected on several aspects of captivity.

The temples are:

- Yamai Devasthan, Aundh, District Satara, maintaining the elephant Moti (male, 70 yrs.)
- Mohan (male, 14 yrs.) belonging to temple (name not known)
- Martanda Devasthan, Taluq-Karad, Pal, Satara district maintaining the elephant Rajendra-Raja (male, 20 yrs.)
- Ganpati Mandir, Peth Bhag, Sangli district maintaining the elephant Bablu (male, 38 yrs.)
- Ganpati Devasthan, Taluq Tasgaon, District Sangli, maintaining the elephant Gauri (female, 21 yrs.)

The differences in ecological, behavioural, social and physical conditions between wild and captive environments play a role in the well-being of a captive elephant. Information about deviations experienced in living environment by captive elephants as opposed to their wild counterparts can be used to provide better conditions in captivity (Lee and Moss, in press). Captive conditions of the elephant has been assessed using several aspects such as its housing, whether allowed to browse/ graze in forest conditions, opportunity for exercise/ social interaction, group size, reproductive and health status, occurrence of stereotypy, etc. Data was collected through observation and interview of personnel/ management. Each of these factors or sub-parameters has been rated on a zero to ten scale with zero representing the worst possible situation and ten implying a satisfactory state, closer to what an animal experiences in the wild.

Ratings were graded in the following manner:

- 0 – 2.4: Bad conditions
- 2.5 – 4.9: poor
- 5.0 – 7.4: moderate
- 7.5 – 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 elephant health. Sub-parameters representing a particular feature such as shelter or water have been grouped together to form a parameter. Rating for a parameter is the mean across the sub-parameters, considering each rating for all the elephants observed. Graphs representing percentage occurrences of rating from zero to ten for each parameter have been included. Graphs depicting ratings for sub-parameters have been given.

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, use of tools to control, etc. Bad or poor handler welfare maybe associated with poor handling of his animal.

Result

Population status

Five elephants each belonging to different temples in the state of Maharashtra were observed and relevant data was collected. Mean age was 32.6 yrs. (SE = 10.2, N =5) with age ranging from 14 – 70 yrs. for the four males. The single female was aged 21 yrs.

Source of elephant

- Mohan (male, 14 yrs.) purchased from Sonapur Mela, Bihar in 1998
- Moti (male, 70 yrs.) purchased from Sadhu Maharaj, Ujjain, Ujjain Math in 1964-1965
- Rajendra-Raja (male, 20 yrs.) purchased from Forest office-Moolehole-Bandipur, Karnataka in 1993
- Bablu (male, 38 yrs.) purchased from Sonapur Mela, Bihar in 1974
- Gauri (female, 21 yrs.) gifted by Shimoga Mutt, Karnataka

Elephants which are captive born/wild caught/purchased across facilities undergo a range of variation in their living environment. This may prove to be a source of stress for the animal. Mean rating was 2.5 (SE =0.0, N =5) showing movement across facilities as a consequence of being purchased/ sold.

Purpose of keeping

All the observed elephants were said to be kept for religious purpose. Maintenance of elephants for non-commercial purposes in natural conditions has been given high ratings Mean rating was 0.0 (SE 0.0, N =5).

Shelter

- The elephants were kept in man-made enclosures: ranging from aluminum tents to RCC sheds. Mean size was 958.8 Sq.ft. (SE = 173.8, N = 4).
- Stone and concrete flooring was available for four elephants, while it was earthen for Gauri (female, 21 yrs.)
- Shade type was from RCC building; tree shade for Moti (male, 70 yrs.)
- Mean number of hours within the enclosure was 18.4 hrs (SE = 0.8, N =5)
- Mean number of hours outside enclosure was 6.0 hrs (SE = 0.8, N =4).
- Shelter was cleaned from once to twice a day

This feature was rated considering type, size, flooring, shade type available and hygiene maintenance. Mean rating was 2.8 (SE = 0.8, N= 22) implying existence of poor conditions. Eighty-two percent of the values were given a rating less than four (Figure 1).

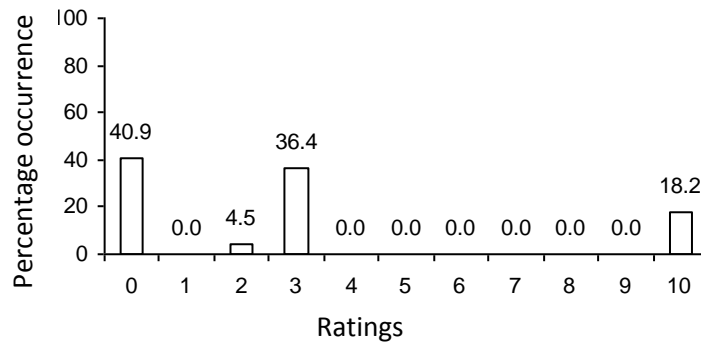


Figure 1: Percentage occurrence of ratings for shelter

Elephants are known to range several kilometers a day while foraging or as part of other species-specific behaviour (Sukumar, 2003). The physical features encountered during such activity forms part of their environment. The occurrence of such natural features in captivity has been given high rating. Mean rating was 2.5 (SE =0.0, N= 5) indicating confinement within an enclosed space.

Existence of natural/ earthen flooring is suitable for elephants and has been given high rating. Mean rating was 2.0 (SE = 2.0, N =5) with only one elephant, Gauri, 21 yrs., female, said to have access to earthen flooring. Wild elephants are known to range several kilometers a day. Confining them to small spaces may lead to poor health and welfare. Mean rating was 0.4 (SE = 0.4, N =5) with all elephants getting a rating less than three for this feature (Figure 2).

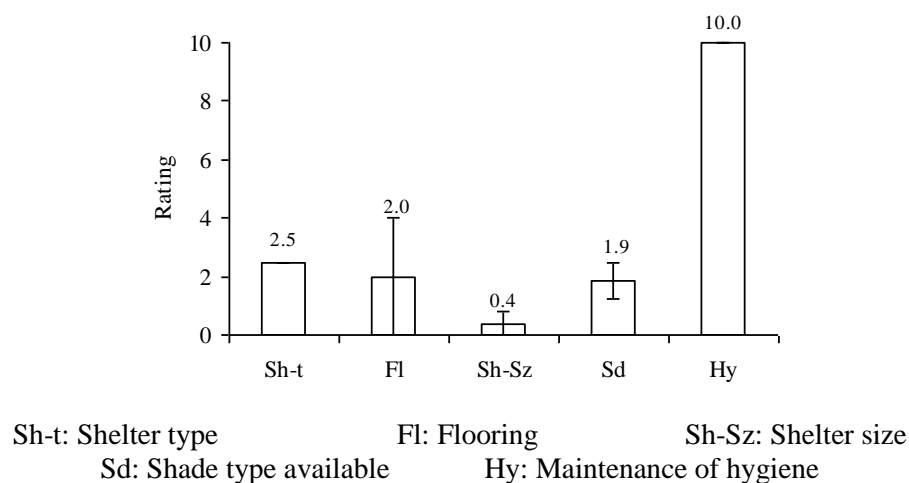


Figure 2: Ratings for shelter relates parameters

Water

- Source of water for all animals was tap water.
- Lake water available for Moti (male, 70 yrs.)
- River water available for Bablu (male, 38 yrs.)
- Mean number of times drinking water per day was 4.0 (SE = 0.4, N = 5)
- Mean quantity of water drinking was 193.8 l. (SE = 25.8, N = 4)
- Mean bath duration was 1.3 hrs (SE = 0.3, N = 5)
- Bathing materials used were brush, soap and stone

Drinking and bathing form part of the natural behaviour of wild elephants (McKay, 1973). This feature was rated considering seven variables such as access to running water, distance, bathing frequency, bathing place, etc. Mean rating was 4.1 (SE = 0.6, N= 31) with 71 % of the all the rating getting a score less than five, showing occurrence of poor conditions (Figure 3).

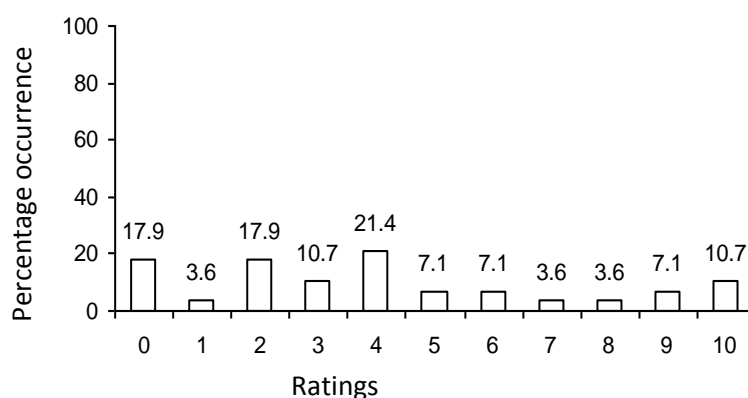


Figure 3: Percentage occurrence of ratings for water

Use of stagnant sources of water has been given low ratings due to increased chance of contamination. Mean rating was 3.9 (SE= 0.7, N=5) showing occurrence of water but through taps or ponds/ lakes. When captive adult elephants are provided a minimum of 150 l. of water per day, high ratings have been given. Mean rating was 4.0 (SE = 0.0, N =4).

Provision of sufficient water to immerse itself and express species-specific behaviour has been given high rating. Mean rating was 0.0 (SE =0.0, N =5) implying existence of bad conditions. Use of hard materials as a scrub may be injurious to the skin of the animal and has been given low rating. Mean rating (Figure 4) was 2.0 (SE =0.0, N =5).

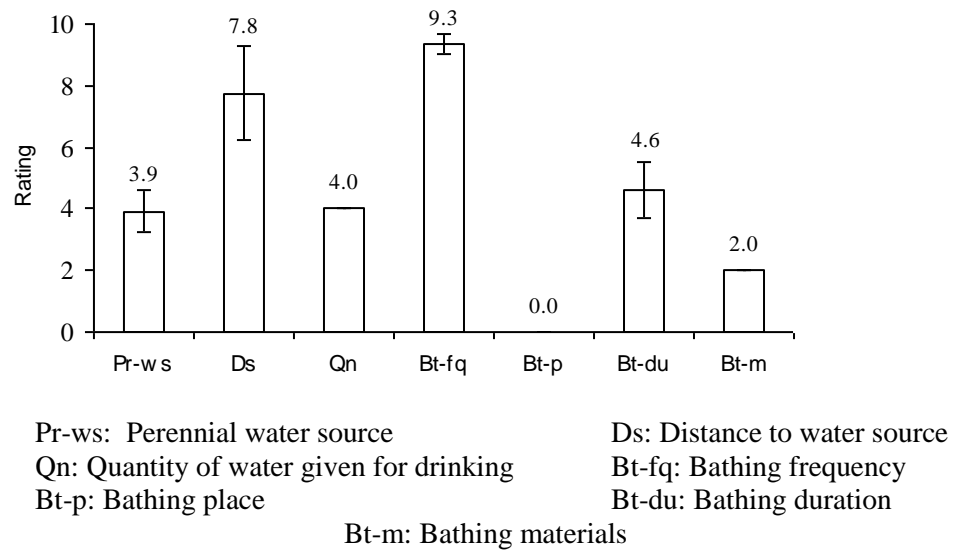


Figure 4: Ratings for water related parameters

Rest and sleep

- Mean sleep duration was 5.1 hrs (SE = 0.5, N =5)
- Rest and sleeping place was shelter

Provision of rest and sleep of sufficient duration and in suitable space was rated. Mean rating was 6.3 (SE = 0.9, N= 20) with place for rest and sleep getting low ratings.

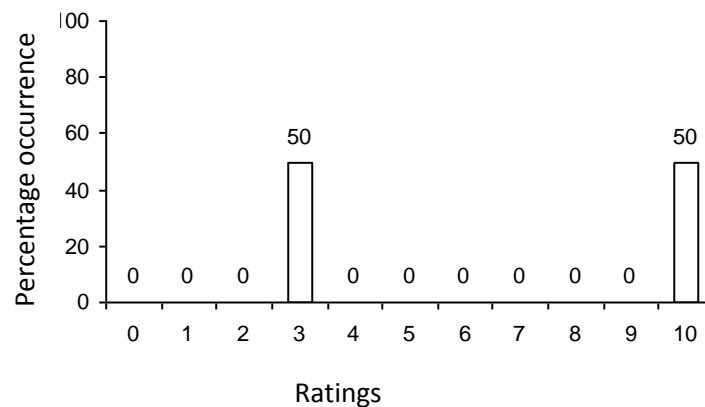


Figure 5: Percentage occurrence of ratings for rest and sleep

High rating indicates provision for such activity. Mean rating was 10.0 (SE = 0.0, N =5). Existence of hard substrates and insufficient space for both activities has been considered for rating. Mean rating was 2.5 (SE =0.0, N =5) for both the activities (Figure 6).

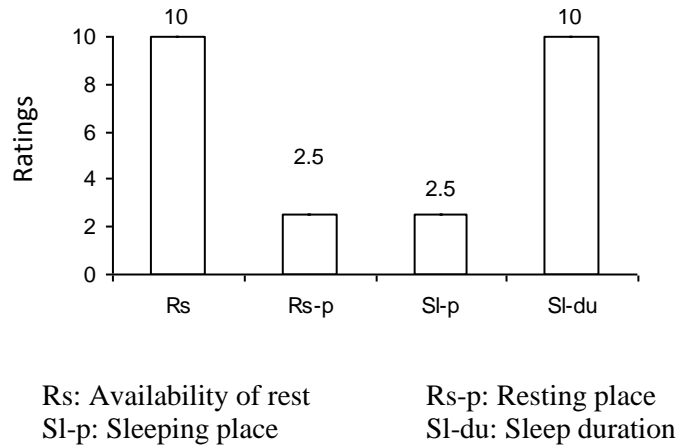


Figure 6: Ratings for rest/ sleep related parameters

Walk

- All the animals were walked
- Nature of terrain was road
- Time of walking was from 6a.m. or 8a.m to 10a.m and 4p.m. or 5p.m. to 7p.m.
- Mean distance of walk was 5.8 km (SE = 1.3, N = 5)
- Mean duration was 4.6 hrs (SE = 0.8, N = 5)

Wild elephants are known to forage several kilometers (McKay, 1973). Hence, in captivity, opportunity provided for walking has been rated as restriction of movement of animals in such situations is common. Mean rating was 6.3 (SE = 1.1, N = 14) considered across three sub-parameters (Figure 7).

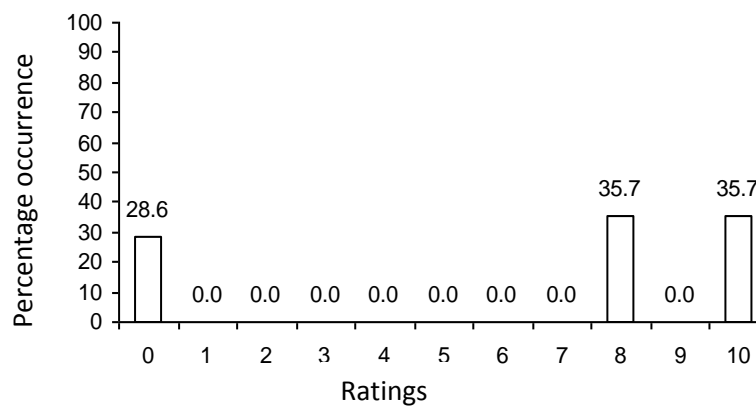


Figure 7: Percentage occurrence of ratings for walk

High ratings have been given when elephants are walked during cooler parts of a day. Mean rating was 7.5 (SE = 0.0, N = 5). Walking on hard substrates such as roads on a long term basis may prove injurious to the elephant's health. Mean rating (Figure 8) was 0.0 (SE = 0.0, N = 5).

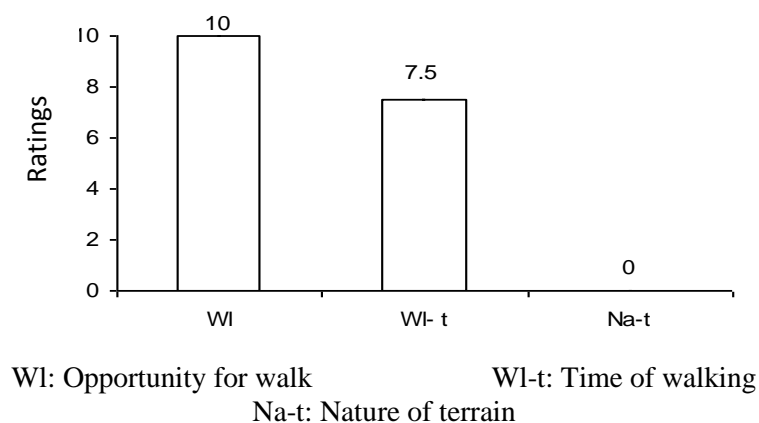


Figure 8: Ratings for walk related parameters

Opportunity for interaction

The opportunity provided to elephants allowed to interact among others to express species-specific behaviour was rated. Mean rating was 2.5 (SE= 1.4, N=4) with only two animals said to be allowed interaction opportunity occasionally.

Chaining

- All the elephants were chained; spiked chain was used for Moti and Gauri.
- Chain was tied in the leg region
- Mean chain weight was 80.6 Kgs (SE = 39.8, N = 4)
- Mean chaining duration was 18.8 hrs (SE = 0.5, N = 5)
- The observed elephants were not allowed to range free at night

Restricting movement of captive elephants by chaining imposes limitations on the ability by the animal to express its natural behaviour in different contexts. This feature was rated across three sub-parameters. Mean rating was 0.0 (SE = 0.0, N= 13) implying occurrence of bad conditions.

Sub-parameters were:

- Whether the observed animal chained or allowed to range-free
- Region of chaining
- Allowed to free range at night

All the sub-parameters were given a rating of zero for all the observed animals.

Behaviour

- All the observed elephants were described as quiet but undependable

Observed behaviour of the animal in terms of its temperament and incidence of aggression towards people can assist in providing a measure of well-being of the animal. Among various causes, aggression could be attributed to those induced by frustration (Broom and Johnson, 1993)[†], inadequate learning opportunity for males with other males / family members during development (Lee and Moss, in press).

- Mean rating for observed behaviour was 1.0 (SE =1.0, N= 5) showing aggressive/ undependable behaviour among four of the five animals observed. None of the elephants was given a rating more than five.

- Mean rating for incidents of killing or injury was 7.5 (SE = 2.5, N = 4) with one elephant, Gauri, female, 21 yrs., said to have shown aggression towards people.

Work

- All the elephants were used for temple related work
- Gauri and Moti were hired for marriage functions
- Moti also hired for filming purposes
- Food provided during work: Fruits, Vegetables, Cereals food, Coconut, Grass, Bread

This has been rated considering the nature of work and availability of food/water/shade/ rest during work. Mean rating was 4.2 (SE = 1.0, N= 24) implying poor conditions (Figure 9).

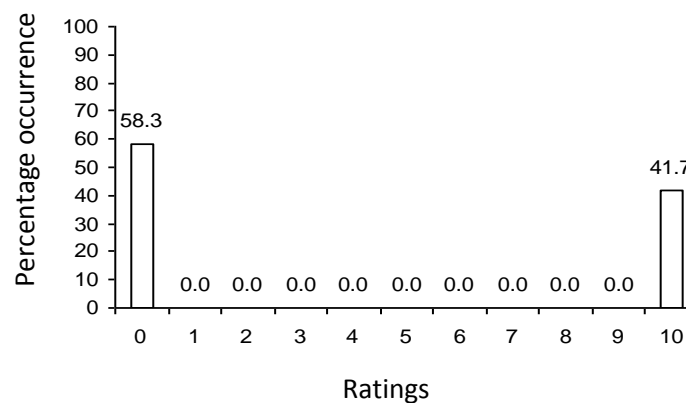
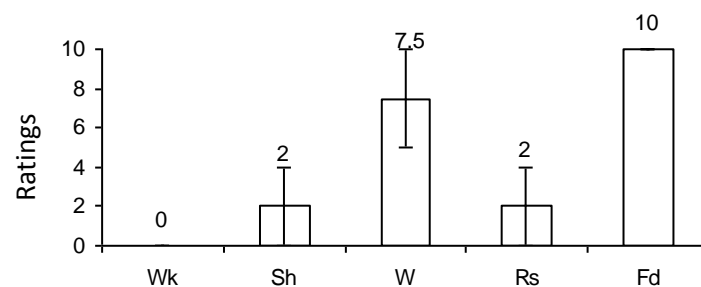


Figure 9: Percentage occurrence of ratings for walk

Performance of work alien to an elephant's natural repertoire of behaviours was given low rating. This includes non-performance of any behaviour wherein the animal is standing still. Mean rating was 0.0 (SE = 0.0, N =5) showing prevalence of bad conditions. Opportunity to rest during work has been given high ratings. Mean rating was 2.0 (SE= 2.0, N = 5). Provision for water during work was given high ratings. Mean rating (Figure 10) was 7.5 (SE = 2.5 N = 4).



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

Figure 10: Ratings for work related parameters

Food provisioning

- All the elephants were given only stall feed
- Feeding area was shelter and while walking
- Food: Dry grass, crops, fruits, sugarcane, Vaidan, Wheat roti, Rice, Kadba Grass, Usa, Pend-wet, Fruits & vegetables
- Food source: purchased from market; For Moti—obtained by begging
- Doodh Peda, Burfi, Jilabi, Puran poli, Modak: sweets provided during festivals and special occasions

The kind and the method of providing food to the elephants was rated using three sub-parameters. Mean rating was 1.2 (SE = 0.5, N = 15) showing existence of bad conditions (Figure 12).

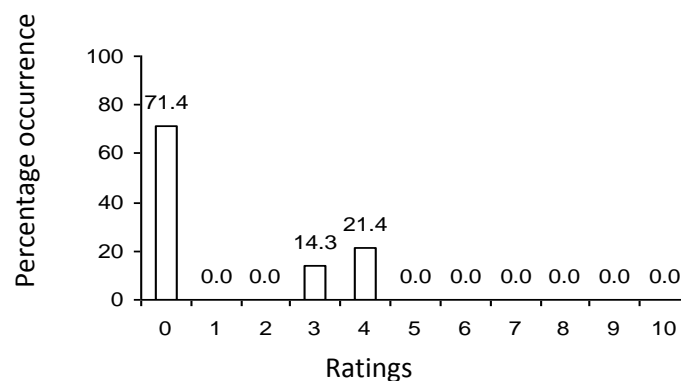
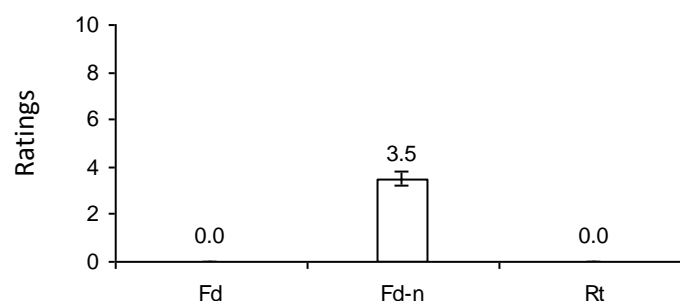


Figure 12: Percentage occurrence of ratings for food

Elephants choose a variety of foods as they browse or graze (Mckay, 1973). When captive elephants are provided only stall feed without any free ranging opportunity, low ratings have been given. Mean rating was 0.0 (SE = 0.0, N = 5). Usage of ration chart can assist in planning for the animal's diet according to its health and physiological needs. Mean rating (Figure 13) was 0.0 (SE = 0.0, N = 5).



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

Figure 13: Ratings for food related parameters

Reproductive status

- All the animals were said to be reproductively active by exhibiting musth (for males) and oestrus cycles (female).

- None of the four observed elephants (no data for Moti) were exposed to members of opposite sex
- Method of handling musth was: Isolation, Chaining, Watering, Use of traditional medicine
- No injury/ killing reported as a result of musth for any of the males
- Leg wounds were reported as post-musth injury for Moti, Rajendra-Raja and Bablu

This feature was rated across four sub-parameters. Mean rating was 3.3 (SE = 1.3, N = 15) showing existence of poor reproductive and related conditions (Figure 14).

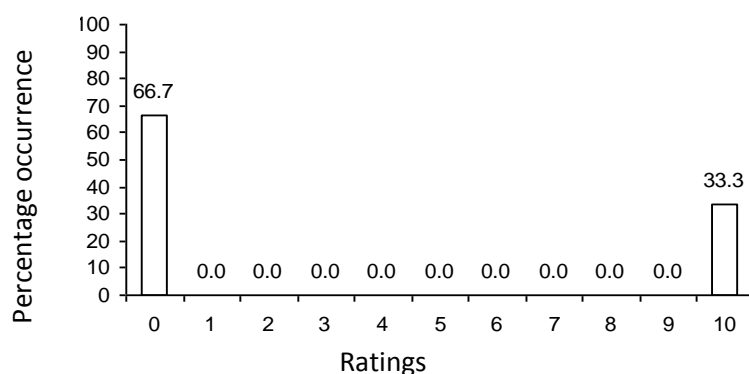
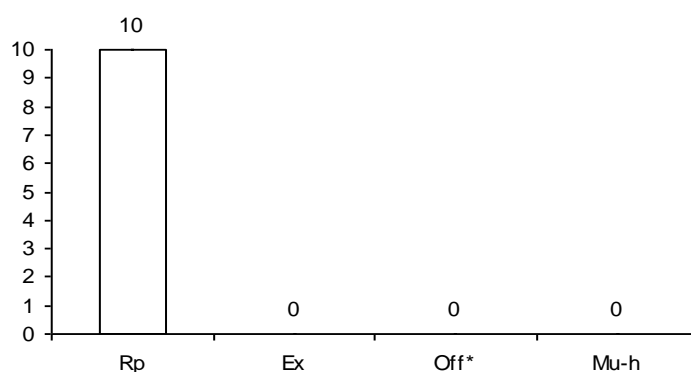


Figure 14: Percentage occurrence of ratings for reproductive status

Active reproductive state in males/ females was rated through observation of occurrence of musth / oestrus cycles. Mean rating was 10.0 (SE = 0.0, N= 5). Opportunity for expression of normal reproductive behaviour among adult animals involves exposure to members of opposite sex. Mean rating was 0.0 (SE = 0.0, N 4). Musth is a period of heightened hormonal levels (Vidya and Sukumar, 2005) with likely expression of aggression towards people/ other animals (Kurt and Garai, 2007). In such situations, the way musth animals are handled can provide an indicator of the well-being of the animal with possible consequences on future reproductive state of the animal. Mean rating was 0.0 (SE =0.0, N = 4) showing bad handling conditions for all the males observed (Figure 15).



Rp: Reproductively/ not Ex: Exposure to opposite sex Off*: Offspring sired
 Mu-h: Handling of musth
 *: No. of observed animals = 2

Figure 15: Ratings for reproductive state related parameters

Health status

- Gauri: right hind leg exhibiting symptoms of paralysis
- Moti: partial blindness in one eye
- Bablu: Toe nail cracks, Sneezing, Right eye problem
- Mohan: Diarrhoea
- Only two elephants had been reported to be dewormed: Mohan and Gauri with varying frequency from once a year to once in three months
- None of the four observed elephants had been vaccinated
- Coconut oil was used while oiling the elephants: Mohan, Bablu and Gauri with varying frequency: from once a day to once a month
- Veterinary doctor said to be available for only two elephants: Mohan and Bablu
- Only one doctor had previous veterinary experience with elephants
- Frequency of visits: on call as well as weekly or monthly

Occurrence of disease/ injury that deviates from those observed in wild animals in terms of kind and frequency is considered to be an indicator of poor well-being of the captive animal (Kaufman and Martin, in press). This parameter was rated across nine sub-parameters which included disease occurrence as well practices followed in maintaining health. Mean rating was 3.6 (SE = 0.8, N= 32) with 65 % of all rating getting a score less than three (Figure 16).

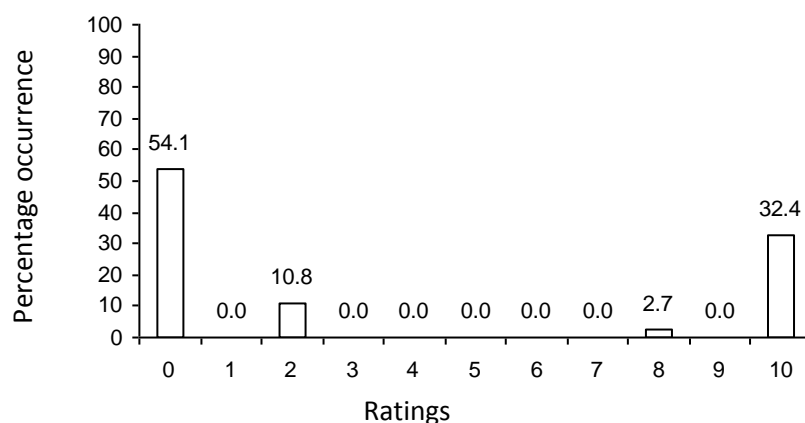


Figure 16: Percentage occurrence of ratings for health status

This sub-parameter has been rated considering the extent of effect on the elephant's health by being harmful/ painful to the animal, creating further health problems and/ or being chronic in nature. Mean rating was 3.2 (SE = 1.2, N= 5) with four elephants getting a rating of only two. The mean rating indicates occurrence of poor health conditions. Oil is applied to various parts of the elephant as an insect repellent/ coolant. Mean rating was 6.0 (SE = 2.4, N = 5) with two of the observed elephants not subjected to this practice.

Testing samples of blood/ dung or urine for various biochemical parameters can give an indication of the health of the animal. Mean rating was 2.0 (SE = 2.0, N=5) with only one elephant Bablu (38 yrs., male) said to have been tested. Access to veterinary doctors is important for providing timely and proper care for the animal. Mean rating

was 4.0 (SE = 2.4, N =5) with doctors said to be available for only two of the observed elephants (Figure 17).

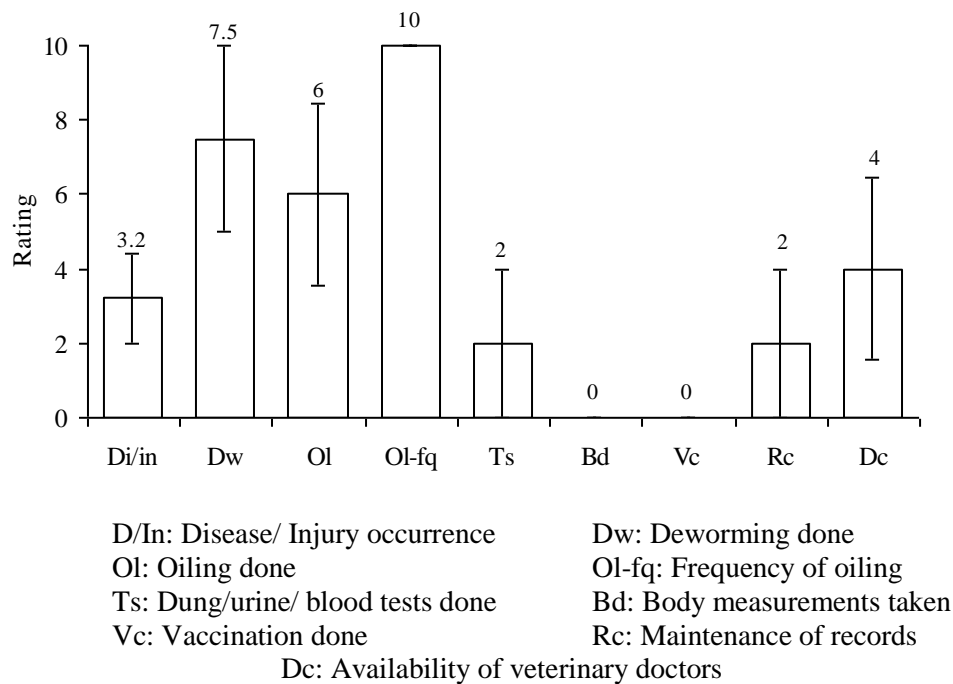


Figure 17: Ratings for health related parameters

Welfare status of Mahout

- All the elephants had one mahout each, the elephant Rajendra-Raja reportedly had two: a 20 yr. old and a 9 yr. old handler
- Mean age of mahouts was 31.8 yrs. (SE = 7.9, N = 6)
- Mean experience in the profession was 19.2 yrs. (SE = 8.2, N =5)
- Mean experience with present elephant was 18.5 yrs. (SE = 8.1, N = 4) ranging from 4 – 40 yrs.
- Mean salary per year was Rs.32,400/- (SE = 9217.4, N = 5) ranging from Rs.12,000 to 60,000/-
- Education ranged from 7th standard to B.Com. graduate
- Occupation of father/ grandfather for all observed handlers was mahout
- All the mahouts (N = 5) were married with number of children varying from two to four
- All the mahouts knew two languages
- All the mahouts used tools Metal ankush and/or stick pike
- Four mahouts were said to have had health check-ups
- Only two mahouts were reported to have no insurance cover
- Mean number of elephants each mahout had worked with: 6.0 (SE = 2.3, N = 4)

Handler welfare status has been rated based on several socio-economic factors. Experience in handling elephants has also been rated. Overall mean rating for handlers was 6.3 (SE = 0.6, N= 46) considered across individual rating for all the sub-parameters (Figure 18).

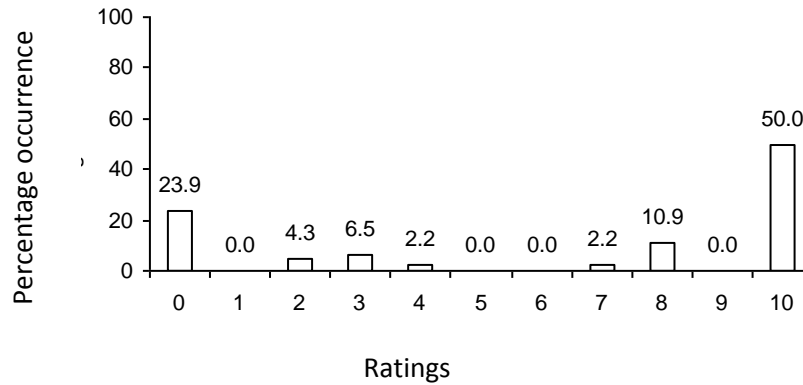
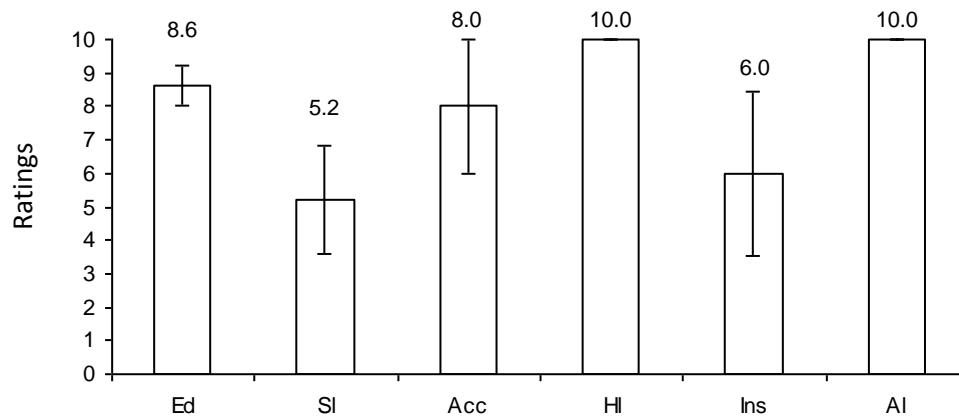


Figure 18: Percentage occurrence of overall ratings

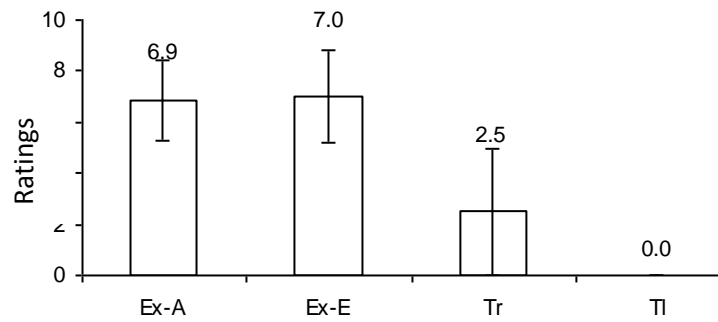
Mean rating for socio-economic status was 7.8 (SE = 0.7, N = 28) considered across six sub-parameters. Mean rating was 8.6 (SE = 0.6, N = 5) with all the mahouts said to have attended school. High ratings were given for wages capable of supporting a family of four in an urban environment. Mean rating was 5.2 (SE = 1.6, N = 5) with wages ranging from Rs. 12,000/- to 60,000/- per year. The occurrence of injury or death as they perform their duties places a high importance to availability of insurance. Mean rating (Figure 19) was 6.0 (SE = 2.4, N = 5).



Ed: Education status SI: Salary Acc: Availability of accommodation
 HI: Health check-up schedule Ins: Insurance cover AI: Alcohol consumption

Figure 19: Ratings for socio-economic related parameters

Mahout-elephant relation was rated considering experience in the profession, use of tools and training status. Mean rating was 4.0 (SE = 1.1, N= 18) indicating poor conditions for this parameter. Higher rating implied more experience in this profession, calculated as percent of mahout's age. Mean rating was 6.9 (SE = 1.6, N = 4) showing existence of moderate conditions. Higher rating indicates more experience with the elephant being observed, with experience being calculated as percent of the elephant's age. Mean ratings was 7.0 (SE = 1.8, N = 5) showing occurrence of moderate conditions for this sub-parameter (Figure 20).



Ex-A: Experience as % of mahout age Ex-E: Experience as % of elephant's age
 Tr: Training in the profession Tl: Use of tools to control elephant

Figure 20: Ratings for socio-economic related parameters

Overall rating pattern for elephants in temples

Overall mean rating, considering individual ratings, across all the observed sub-parameters, was 3.6 (SE = 0.3, N= 214) indicating occurrence of poor conditions. Sixty-two percent of the values were given a rating less than four. Among the sub-parameters rated, 44 % could be assigned only two types of rating: zero or ten. Zero scores from such sub-parameters accounted for 25 % of all the rating implying complete absence of the feature (Figure 21).

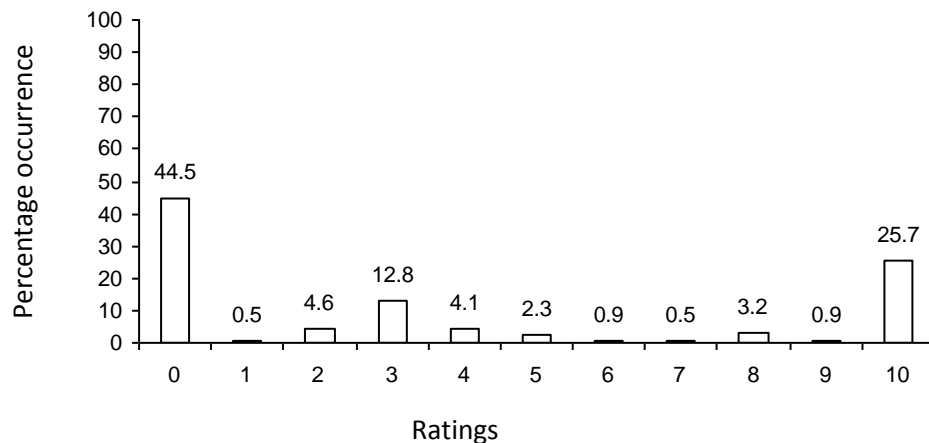


Figure 21: Percentage occurrence of overall ratings for elephants

Discussion

Overall mean rating for captive elephants in temple was 3.6 and “Poor” conditions (ratings between 2.5 and 4.9) imply a considerable deviation from the wild state. Poole and Granli (in press) state the need to consider “tame” elephants—captive elephants— as basically wild animals with the same social, behavioral, psychological and emotional needs as their wild counterparts. This is because elephants have not been domesticated: change in their genetic make-up, due to their human association, has not occurred.

- Wild elephants are known to travel several kilometers (Sukumar, 2003) as they forage and engage in species-specific activity. This involves traversing varied habitat, a feature completely absent for all the observed elephants. All the animals were provided with man-made enclosures of an average of 958.8 sq.ft. this was also their resting/ sleeping place.
- Maintenance of single elephants in these institutions: wild elephants are known for their rich social relations (Vidya and Sukumar, 2005), even males require a period of learning within a social framework to recognize the intricacies of the different individuals making up this society (Kurt and Garai, 2007).

All the observed elephants were kept singly, with occasional opportunity for interaction, during festivals, reported for only two males.

- Elephants have been reported to be near water sources in the wild (McKay, 1973). Access to and use of water sources depends on the animal. However, among the observed elephants for this report, tap water was the source for all, wherein access and use is dependent on people. Even the elephants, Moti (male, 70 yrs.) and Bablu (male, 38yrs.) with access to lake/ river water were in no different state as they were not allowed to range free.
- Food provisioning: wide variety of plant species is said to be used by wild elephants (McKay, 1973). The observed animals were not allowed to range free, stall feed being the only food source.
- Reproductive status: wild elephants use visual and olfactory cues to signal their reproductive status (Vidya and Sukumar, 2005). Such species-specific behaviour becomes redundant in the absence of animals of opposite sex. All the observed elephants were reported to have no opportunity to mate due to absence of animals of opposite sex. Musth period among bulls is characterized by actively searching for mates, defending females, scent marking and increased roaming, in the wild (Kurt and Garai, 2007). All these features were conspicuously absent due to the practice of chaining and isolation of the observed bulls.

Conditions in captivity which were not conducive to the elephant's well-being:

- Kurt and Garai (2007) report of the ill-effects of wrongly fixing chains or constantly chaining the same region, on the skin and consequent wound formation among captive elephants. All the observed elephants were chained an average of 18.8 hours a day, with spiked chains being used for two elephants: Gauri and Mohan (male, 14 yrs.).
- Floor type was concrete/ stone, except for the elephant Gauri (female, 21 yrs.). Hard floors and poor foot health among captive elephants maybe correlated (Benz, 2005).
- Work type involved behaviours such as saluting, performing temple duties. These activities are not natural to the elephant's behavioural repertoire and may involve harsh training procedures. Three of the observed animals were also hired for marriage functions or movie picturisation. Such activities imply chances of being overworked for commercial gain.
- Record maintenance (health/ clinical/ service) was poor with only one institution claiming maintain records.

The socio-economic status of the mahouts was rated as being satisfactory, with a relatively low rating for the wages paid. However, their experience with elephants in terms of tool use to control the animal represented bad welfare conditions.

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Section 6:
Captive Elephants of Temples of Tamil Nadu

Executive summary

Tamil Nadu has a long history of keeping elephants in captivity; however, there have been few attempts at measuring or documenting the captive condition of these animals. This study aims to measure the status of temple-owned elephants, with a view to assess the way in which these animals are taken care of.

A total of 54 parameters were observed and recorded on their living conditions and each parameter was rated on a scale of 0 to 10, with 10 representing the most ideal condition for the animal. Twenty-five temple-owned elephants were selected across different locations in Tamil Nadu. Each temple corresponded to one location, thus total locations were 25. Of these, 24 were females ranging in age from 6 to 57 yrs with a single 18 yr old male elephant resulting in a sex ratio of 0.04:1 (Male: Female). The average age of the elephants was 30.58.

Fifty seven percent of the enclosures were made of concrete or reinforced concrete material while 30 % had iron sheet or stone as part of the enclosure. Thatched leaves were recorded in three temples: The overall mean rating for shelter was 3.81 with values ranging from 0.00 to 5.83 for each location. Mean rating for floor type was 0.42 and 95 % of the shelters had hard floors with only one shelter providing an earthen floor.

Ninety percent of the temples provided water through taps. Ponds, tanks and rivers were also used for providing drinking water or for bathing the animal. The distance to water source depended on the number of sources used: tap water at zero distance to the animal while ponds /rivers were situated several kilometers away. The mean distance to a water source not inside the enclosure was 2.75 Km. Overall mean rating for water related variables were 3.64.

Tamil, Malayalam, Urdu and Hindi were the languages used to give commands to the elephants. The mean number of commands was 23. Though all the elephants had temple related work to perform, the number of commands ranged from 7 to 50.

The mean rating for providing training was 1. The mean score for number of commands to be learnt was 2.22 with 77.77% of the elephants getting a score of 0. The rating indicates that the elephants were forced to learn higher number of commands for a longer period of time.

Of the animals observed across different locations for social interaction, only one was allowed to interact, and the mean rating for prevalence of social interaction was only 0.57.

For elephants observed, work type was temple oriented: standing in front of the temple, going around it, taking part in temple festivities. Mean work duration was 6.54 and the mean rating for work type was 0

Ninety-two percent of the elephants were stall fed while two percent were allowed to free range and provided stall feed. Food types were varied: rice, sorghum, ragi, pongal (rice and lentil porridge) , pulses, coconut leaves, green fodder, mineral mixture, salt, ghee (clarified butter) and sugar Mean rating for food and related parameter was 5.42 with 91.7 % of the elephants getting a score of 5.

All the elephants observed had chains on their legs with 46 % of the animals having two chains— front legs shackled or front and hind leg. The overall mean rating for chain related parameters was 0.47

Forty-two percent of the observed elephants were not cycling while the status was not known in 25 % of the animals. 25 % of the animals were reported to be cycling. However, none of these animals were exposed to males. The lone male maintained among the temples observed was said to exhibit musth.

All the temples had access to a veterinary doctor with 16 locations having access to a doctor on call with mean distance to the doctor being 3.94 km. Ten locations maintained medical records along with insurance particulars in some cases. Vaccination was provided against anthrax for twenty-two elephants. Overall mean rating for veterinary care was 9.84.

The mean value for veterinary facility was 6.84, the individual mean rating ranged from 4.6 to 9.5, and 50% of the doctors did not have any elephant experience.

Mean age for mahout was 41.5 yrs and for cawadi, mean age was 36.9 yrs. Mean wages for mahout was Rs. 17,218/ year. The overall mean rating for mahout experience was 8.39 ranging from 2.5 to 10.

The overall mean rating for elephants across all the parameters observed was 4.8. The overall mean for handlers was 6.2 and the results are statistically significant indicating the welfare status of Mahout/ Cawadi was relatively better than that of the elephants.

Introduction

Tamil Nadu has a long history of keeping elephants in captivity. The practices followed in providing care for an animal with unique needs for space/ behavioural biology/ health need scrutiny, especially in the light of constraints of resources/ disinterest encountered while maintaining captive elephants. However, there have been few attempts at measuring or documenting the captive condition of these animals. This study aims to measure the status of temple-owned elephants, with a view to assess the way in which these animals are taken care of. Temples in different districts of Tamil Nadu were selected for collection of data on their condition in captivity.

Objective

To assess the welfare status of captive temple elephants in Tamil Nadu by quantifying the living conditions as well as the behavioral and the physiological status of the captive animal through a specific rating scale.

Method

Twenty-five temple-owned elephants were selected across different locations in Tamil Nadu. A total of 54 parameters were observed and recorded ranging from living conditions such as shelter type, size, water availability, nature of floor, shade availability, to behavioral and physiological aspects such as the nature of observed personality of the elephant, provision for social interaction with other elephants, occurrence of stereotypy, reproductive status of the elephant, etc. Each parameter was rated on a scale of 0 to 10, with 10 representing the most ideal condition for the animal. Parameters of the “yes-no” type get only two kinds of scores: 0 or 10.

For example: provision of hard surfaces such as stone or concrete floors get a score of 0 as compared to the availability of natural substrates like an earthen floor. Low score for hard surface is meant to reflect the ill-effects of such substrates on the health of the animal, specifically the feet of an animal as large as the elephant.

Data Processing

The parameters observed and recorded for the elephants have been evaluated and rated as per a defined set of criteria, developed by experts. These values are meant to reflect the welfare status of each elephant. The overall mean rating values which include several sub-parameters have been presented and this is compared with the rating for each location/ elephant/ mahout. This is followed by the mean rating of each sub-parameter.

Each parameter has been rated independently as per defined rules, without considering its relative association with other parameters. Thus, the scores reflect a parameter's individual identity. For each parameter, the mean values were calculated along with the standard error (S.E).

Results

Population status

Of the elephants observed, 24 were females ranging in age from 6 to 57 yrs and three was a single 18 yr old male elephant, resulting in a sex ratio of 0.04:1 (Male: Female). The average age of the elephants was 30.58 (SE. = 0.17, N= 25) with the average

height being 248.55 cms (SE. = 0.21, N= 22) ranging from 207 cm to 290 cm. Mean age of females was 31.1y (SE= 3.3, N= 24) ranging from 6-57y.

Status of Shelter

Fifty seven percent of the enclosures were made of concrete or RC material while 30 % had metal sheet or stone as part of the enclosure. Thatched roof was recorded in three temples

Seventy-five percent of the temples had stone or concrete floors while 21 % had both stone /concrete floors along with mud /sandy floors. There were no shelters with purely mud or earthen flooring. The mean shelter size for the elephants was 943 sq.ft. (S.E= 2.37, N = 13). Minimum area recorded was 6.25 sq.ft. and the maximum was 2500 sq.ft. across the observed temples.

On an average, each animal spent 15 hours within the enclosure (S.E.= 0.0.12, N = 19) with the adult male being confined for 24 hrs from the past six months (upto the period of data collection in August 2005) to its enclosure as he was reported to be aggressive and rough. A 40yfemale was kept in her shelter for 22 hours per day. Minimum duration was 6 hours per day. Reasons for keeping the animal in confinement varied from maintaining safety of the animal to providing rest or for use in temples.

The trees (coconut *Cocos nucifera*, neem *Azadirachta indica*) planted in the enclosure provided shade to the some of the elephants in the temples, while the enclosure itself provided shade for some. An 11.4y female was reported to be kept in the open without shade during daytime. A fan was provided for another female elephant in her enclosure. All the shelters claimed to clean the enclosure at least once a day. Some temples used soap, water or disinfectant to clean the space.

A significant parameter for captive elephants is the status of shelters they are housed in. Unlike free-ranging wild elephants which range across vast distance (Kane, et al., 2005), some captive elephants live in man-made enclosures/ areas.

Six sub-parameters were assessed to calculate the overall value for the 'shelter' parameter. The overall mean rating for shelter was 3.81 (SE = 0.41, N=6) with values ranging from 0.00 to 5.83 for each location. An average of 12% of the sub-parameters were of the yes-no type. A temple, housing a 25y old female elephant was constructed of natural materials with natural flooring and provided protection against weather through a closed type of shelter.

The mean rating for shelter type was 2.2 (S.E. = 0.0.14, N= 20) with 85% of sampled elephants scoring less than 3. These values reflect the following factors: man-made enclosures with non-natural roof material (concrete/ tin roof). The exceptions were two temples with a score of 5 indicating presence of a man-made enclosure made of natural materials.

Home range size of elephants is reported be around 100- 300mKm² (Sukumar, 1991). Rating for shelter size was 0.05 (S.E = 0.02, N= 21) with 95% elephants getting a score of 0. Minimum shelter size recorded was 6.25 sq.ft.

Mean rating for floor (Figure 1) type was 0.42 (S.E. = 0.06, N = 24). 95 % of the shelters had hard floors with only one temple providing an earthen floor during day as well as night. Hard floors have been associated with foot problems in elephants (Benz, 2005).

Most of the enclosures (Figure 1) were the closed type, mean rating = 9.72 (S.E. = 0.06, N= 18) with 94 % shelters getting a score of 10. This indicates provision of protection against high temperatures, rain, etc. However, the closed shelters are not considered suitable as they do not provide natural conditions for captive elephants. Still, if captive animals are confined, provision of closed shelters provides protection against extreme weather conditions.

Eight-eight percent of the shelters sampled were the permanent type. This showed availability of a secure place for the animal. This was, however, offset by the attributes of the shelter as mentioned above.

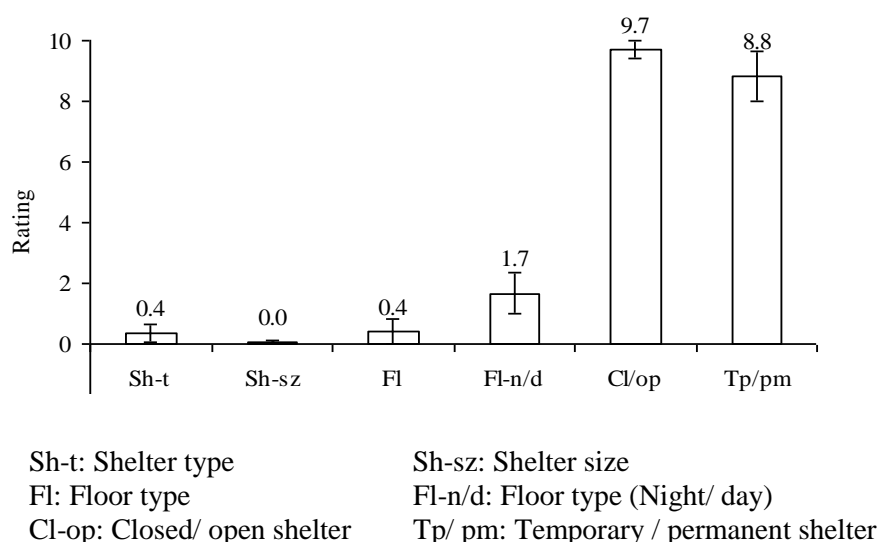


Figure.1: Ratings for shelter for sampled temple elephants

Availability of water for drinking/ bathing

Ninety percent of the temples provided water through taps (from sources such as borewells). Ponds, tanks and rivers were also used for providing drinking water or for bathing the animal. The distance to a water source depended on the number of sources used: tap water at zero distance to the animal while ponds / rivers were situated several kilometers away. The mean distance to a water source not inside the enclosure was 2.75 Km (S.E. = 0.24, N = 8). The maximum distance recorded was 5 km to a river. The tank water used for bathing a temple elephant in one location was observed to be greenish in colour and was reported to be contaminated with detergents as it was also used for washing clothes.

The elephants were reported to be drinking an average of 107 l. of water per day (S.E = 0.47, N = 23). Seventy percent of the animals were bathed within the enclosure itself with a mean duration of 1.43 hrs (S.E. = 0.06, N = 22). Materials used for bathing the elephants were brush, broom and stone. 90 % of the temples used either a

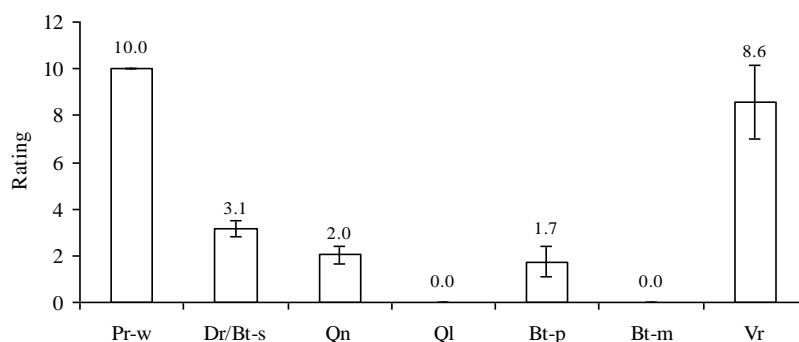
brush or brush and broom for bathing the animals. With the provision of borewells, seasonal variation in water availability was reduced.

Provision of water is a major factor for elephants as wild elephants are known to drink water at least once a day (Shoshani and Eisenberg, 1984). This assumes greater importance in the context of a captive situation where a shelter has to make available such facilities and the animal is usually not given the freedom to decide when to drink/ bathe.

Overall mean rating for water related variables were 3.64 (SE = 0.33, N = 7). The values for individual locations ranged from 2.00 to 6.5. The lower score of two was significantly different from the overall mean ($z = 2.01$, $p < 0.05$) indicating poor conditions for water provision.

All the shelters had access to water (mean =10, S.E.=0, N= 25). However, mean rating for source of water (Figure 2) with respect to type of water (stagnant/ running) was 3.14 (S.E. = 0.05, N = 25). Eighty percent of the temples scored < 5 for this variable indicating availability of poor quality water. Only four temples had availability of running water.

The mean rating for the kind of bathing materials used was 0 (S.E. = 0, N = 22) reflecting on the use of unsuitable bathing materials. When the quantity of water that these elephants drink was scored, mean value was 2.04 (S.E. = 0.06, N = 23) with 78.26 % of the elephants reported to drink < 150 l. of water a day while in the temples. Only three temples were reported to provide 150-200 l. of water. None of the temples had conducted tests on quality of water (mean = 0, S.E. = 0, N= 13).



Pr-w: Availability of perennial water source DR/Bt-s: Drinking/ Bathing water source
 Qn: Quantity of water consumed Ql: Tests of water quality
 Bt-p: Bathing place Bt-m: Bathing materials
 Vr: Seasonal variation in water availability

Figure 2: Mean rating for water related parameters

Availability of rest, shade and sleep

The sizes of resting and sleeping places were the same with a mean of 696sq.ft. (S.E = 1.37, N = 16). Mean duration of sleep was 7.95 hours (S.E = 0.14, N = 21) with 61 % sleeping in the night and 38 % sleeping during the day and night.

All the elephants were accompanied by their mahouts during walks. Mean distance was 4.88Kms (S.E = 0.11, N = 16) with a mean duration of 3.24 hours (S.E. = 0.10, % CV = 0.03, N= 19). The elephants walked on plain surfaces, which was usually road, or within the temple. Elephants in captivity have limited opportunity to rest or sleep. Their managers/ handlers decide when these elephants can/ cannot rest/ sleep. Mean rating averaged across several parameters (rest, shade and sleep related variables) was 5.99 (S.E. = 0.41, N = 6). An average 53% of the sub-parameters were of the yes-no type. Mean scores for individual locations ranged from 5.00 to 7.80.

Specific Rest, Shade, Sleep parameters

Availability of rest, sleep and shade availability per se get a score of 10. However, scores for related and equally important parameters were low. Mean rating for resting place was 0.88 (S.E = 0.09, N = 17) indicating poor resting conditions with 83.25% of the locations getting a score of 0. The resting places (Figure 3) for three elephants were given a rating of 5.0 indicating availability of natural substrates in the resting place. The results were similar for sleeping place with a mean of 0.65 (SE = 0.06, N = 23) with 86.9% of the shelters getting a score of 0.

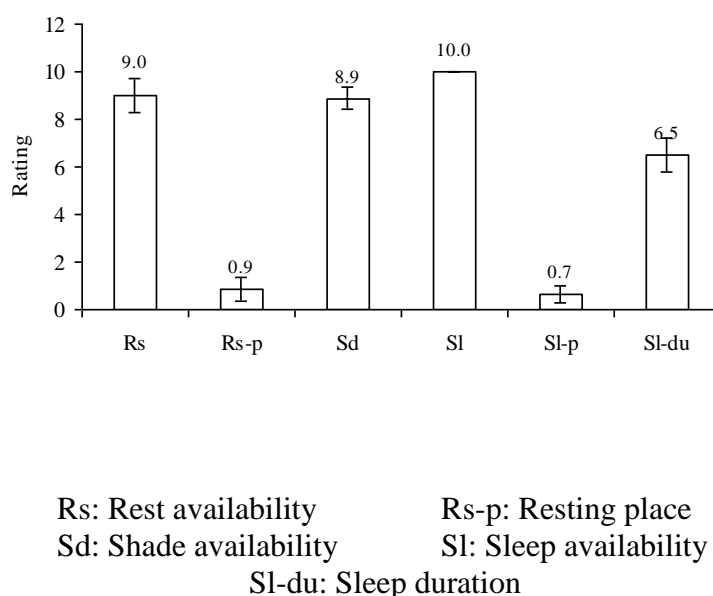


Figure 3: Mean Rating for rest, sleep, shade parameters

Provision of physical exercise (Opportunity to walk)

Captive elephants, owing to the nature of their captive situation, usually have restricted access to free movement. Hence, provision of physical exercise has been scored. Mean rating for providing exercise to the elephants by allowing them to walk was 9.58 (S.E. = 0.06, N = 24). The mean rating value for nature of terrain on which elephants were made to walk was 0 (S.E. = 0, N = 9) indicating unsuitable substrates. One adult male elephant had not been given an opportunity to walk for the last six months (from March-August, 2005, at the time of data collection).

Training

Tamil, Malayalam, Urdu and Hindi were the languages used to give commands to the elephants. The mean number of commands was 23 (S.E = 0.39, N = 15). Though all the elephants had temple related work to perform, the number of commands ranged

from 7 to 50. Training is believed to be an integral part of a captive elephant's life. Scores were designed to reflect easier training period for the elephant and minimum number of commands to learn. The mean rating for providing training was 1 (S.E. = 0, N = 21). The mean score for number of commands to be learnt was 2.22 (S.E. = 0.12, N = 18) with 77.77% of the elephants getting a score of 0. The rating indicates that the elephants were forced to learn higher number of commands for a longer period of time.

Opportunity for social interaction

Of the animals observed for social interaction, only one was allowed to interact: a 38 yrs old female was allowed 14h interaction with an 8 yrs old female.

Despite the knowledge that elephants need to interact with their own kind, most captive elephants are subjected to a solitary life. The mean rating for prevalence of social interaction was only 0.57 (S.E. = 0.20, N = 7).

Behaviour

Of the observed elephants, twenty-two were reported to be quiet. Two adult elephants, female and male were reported to be nervous. Among these two elephants, the female had injured one person and the male was aggressive towards his mahout. Stereotypic behaviour observed were — ear, trunk and tail movements — among twelve elephants.

Lack of opportunity to express species-typical behaviours in a captive situation may be a source of stress (Bradshaw, in press). The mean rating for observed personality was 9.58 (S.E. = 0.05, N = 24) indicating pliant nature of the elephants. However, this may be due to conditioning to be submissive. A related factor of equal importance is the occurrence of stereotypy. The mean rating was 0 (S.E. = 0, N = 9) with intensity of stereotypy being 0.92 (S.E. = 0.05, N = 12). These values indicate that elephants exhibit stereotypy with noticeable intensity.

Work parameters

All the elephants belonged to temples and hence work was temple oriented: standing in front of temple, going around it, taking part in temple functions. Mean work duration was 6.54 hours (S.E. = 0.21, N = 13) ranging from no work to 10h/day. Two female elephants were not provided shade, water, food or rest during work.

Work type defines the captive environment of an elephant. Scores were designed such that work type closest to an elephant's natural way of life was given a higher rating. The mean rating for work type was 0 (S.E. = 0, N = 18), while the mean for duration of work was 0.71 (S.E. = 0.12, N = 15). Work type (Figure 4) for temple elephants was to stand in front of the temple with/ without provision of shade. Although this may not seem to be physically demanding for the animal, holding a constant posture of one kind over a long duration on unsuitable substrates will lead to health problems.

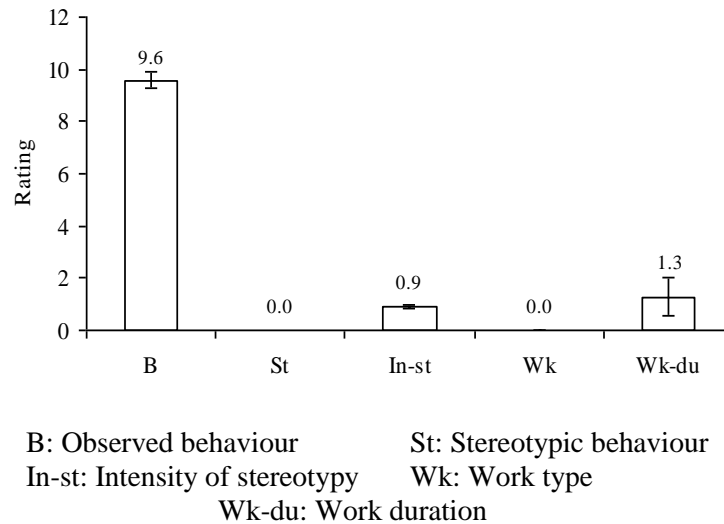


Figure.4: Mean Rating for 'observed behaviour' and 'work' parameters

Provision of food

Ninety-two percent of the elephants were stall fed while two percent were allowed to free range and were provided stall feed. None of the elephants depended on free ranging only, for food. Food types were varied: rice, sorghum, ragi, pongal, pulses, coconut leaves, green fodder, mineral mixture, salt, ghee and sugar. Provision of the three major food types: carbohydrates, proteins and roughage were observed in eight elephants. Mean number of food items was 4.04 (S.E = 0.08, N = 25). Provision of unsuitable foodstuff such as sugar, ghee or spicy food was observed for 17 elephants.

Overall mean rating for food related parameters were 6.31 (S.E. = 0.29, N= 3). Ratings ranged from 5.00 to 8.33, with 24% of the temples scoring 8.33 and 48% of the locations scoring 5.00. Scores for method of providing food, i.e., whether allowed to free range or were stall-fed revealed a mean value of 5.42 (S.E = 0.05, N = 25) with 91.7 % of the elephants getting a score of 5. This indicates most of the elephants are not allowed to forage for themselves in forest conditions, with only two temples allowing their female elephants to free range and provided her with stall-feed.

Mean rating for the type of food given (provision of pulses, carbohydrates and roughage) was 6.25 (S.E. = 0.05, N = 25) indicating provision of less than three types of food (pulses, roughage, carbohydrates) with 68% of elephants getting a rating of 5 indicating provision of only two types of food. Five temples provided all three classes of food types. Average rating for number of food items was 7.2 (S.E. = 0.06, N = 25), which shows that the elephants were given 2-5 items of food.

Chaining details

All the elephants observed had chains on their legs with 46 % of the animals having two chains— front legs shackled or front and hind leg chained (N = 19). Mean chain length was 504cms (S.E. = 1.22, N =15), mean chain weight was 43kg (SE. = 0.40, N = 14). An adult male elephant had its two front legs shackled and length of the chain was 300cms. A feature characteristic of captive elephants is the presence of chains and use of the same to restrict movement of the animals.

The overall mean rating for chain related parameters was 0.47 (SE. = 0.21, N= 5). Mean rating for individual elephants ranged from 0.00 to 1.25. There was no significant difference among the elephants for this feature. Constant and prolonged chaining can prove to injurious to the animal's skin (Kurt and Garai, 2007), may result in increased frequency of stereotypy (Gruber, et al., 2000).

Mean score for allowing the elephant to free-range (Figure 5) was 0.09 (SE. = 0.02, N= 23) with 100% of the sampled elephants scoring < 1 for this variable. Similarly, when region of chaining was scored, mean value was 0.4 (S.E. = 0.04, N = 20) specifying use of more than one region of chaining for 95.7% of the animals and one region chaining for all sampled animals. The parameter 'chain weight' averaged 0.14 (S.E. = 0.04, N= 14) with 85.71% of the temples using chains weighing greater than 10 kg.

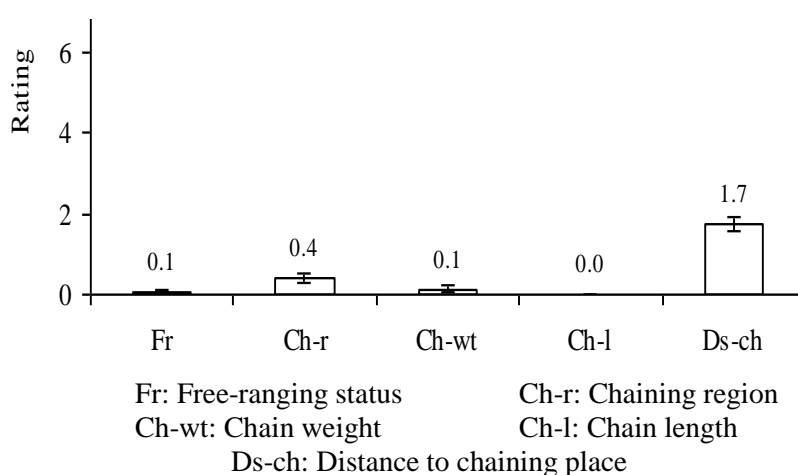


Figure.5: Mean Rating for 'chaining' parameters

Reproductive status

Forty-two percent of the observed elephants were not in oestrus cycles while the status was not known in 25 % of the animals. 25 % of the animals were reported to be cycling. However, none of these animals were exposed to males. The male elephant in one of the temples was reported to have been in Musth.

It is assumed that a reliable indicator of health is the reproductive status of a captive animal. Mean rating for the occurrence of oestrus cycles was 3.33 (S.E = 0.28, N = 9). 66.7% of the sampled female elephants were not cycling, with only three elephants said to be in oestrus cycles. The mean for exposure to males was 0 (S.E = 0, N = 8). The lone male elephant in this sample was reported to be in active reproductive status and in Musth; however, no data was available for exposure to females or number of calves sired.

Veterinary treatment routine

Ribs were not visible for all the elephants observed (N = 21). Scapula was reported to be spinous, not visible for 91% of the elephants while 9 % had their scapula partially visible or visible. Of the twelve elephants observed, elasticity of skin was described as slow for ten while it was quick for two animals. Vaccination was provided against anthrax for twenty-two elephants. A 37y old female elephant was reported to have

opacity of the eye for which treatment was being given. All the temples (N = 25) had access to a veterinary doctor with 16 locations having access to a doctor on call with a mean distance of 3.94kms (S.E. = 0.14, N = 16). Ten locations maintained medical records along with insurance particulars in some cases. Adherence to the veterinary routine prescribed for the captive animal (for the observed period) was scored. Overall mean rating for this feature was 9.84 (SE= 0.17, N= 3). An average 35% of the sub-parameters were of the yes-no type. Individual mean values ranged from 6.667 to 10.

Veterinary doctor - Availability and facility

The mean value for veterinary facility (availability of doctor, doctor's experience, availability of clinic facility, etc.) was 6.84 (S.E. = 0.38, N= 7). The individual mean rating (Figure 6) ranged from 4.6 to 9.5. This may indicate that a significant variation in the kind of veterinary facility available. However, even with access to a veterinary doctor in all the locations, 50% of the doctors did not have any elephant experience.

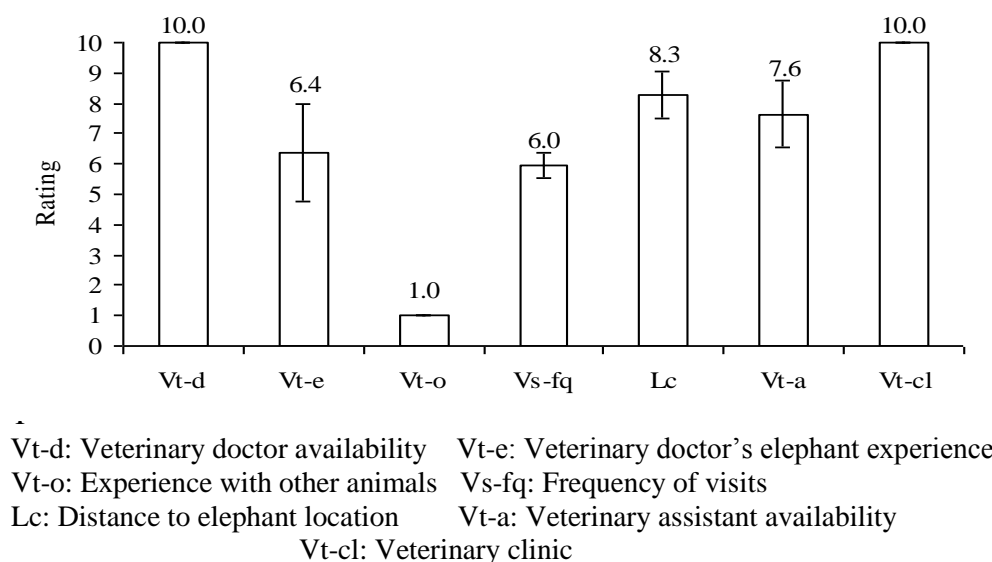


Figure.6: Mean Rating for 'Veterinary Doctor Availability and facilities' parameters

Mahout's socio-economic status and experience with elephants

The welfare status of a captive elephant is directly linked to the Mahout/ Cawadi's relationship with the animal. In addition, welfare is indirectly linked to the mahout/ cawadi's socio-economic status, as inadequate income or poor housing facility may show up in the form of bad handling of the animal. The Mahout/ Cawadi's welfare status was assessed using 16 different parameters such as experience as an elephant handler, education level, salary per year, marital status, availability of accommodation, etc. An average of 26 % of the parameters were of the yes-no type. Mean age for mahout was 41.5 yrs (SE. = 0.27, N = 25) and for cawadi, mean age was 36.9 yrs (SE = 0.43, N = 15).

Mahout/Cawadi experience

The overall mean rating for mahout experience (Figure 7) was 8.39 (S.E = 0.44, N= 4) ranging from 2.5 to 10. The overall mean rating for Cawadi experience was 7.58 (S.E = 0.48, N= 4) ranging from 3.33 to 10. Twenty one percent of the cawadis scored 10 for this feature.

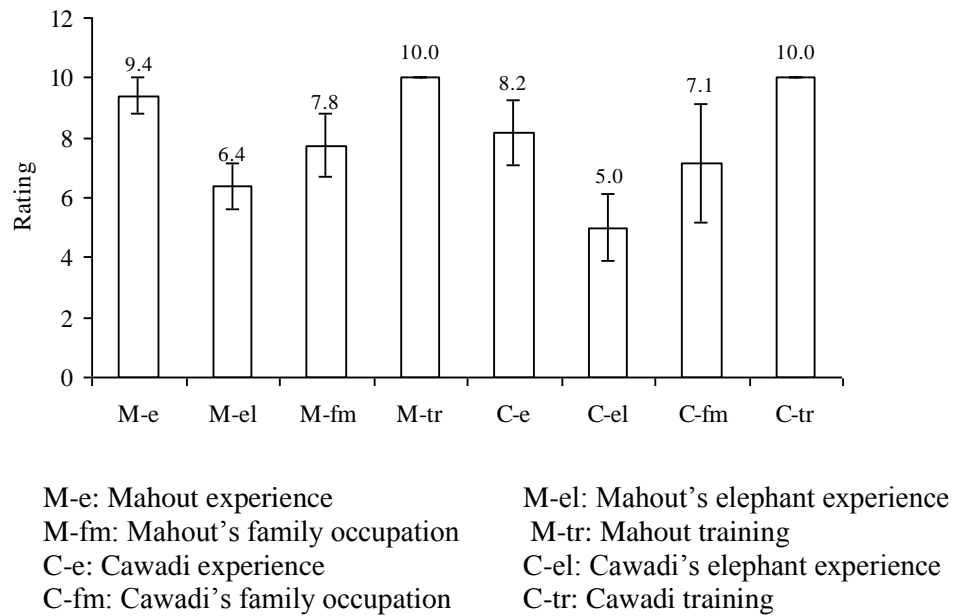


Figure 7: Mean rating for 'Mahout/ cawadi experience' parameters

Use of tool to control elephant

The mean rating for the use of tools by Mahout was 3.9 (SE= 0.12, N=19) indicating prevalence of use of tools. Also, mean rating for tool type (Ankush, wooden stick, etc) was 0.46 (SE. = 0.06, N = 12).

Socio-economic status

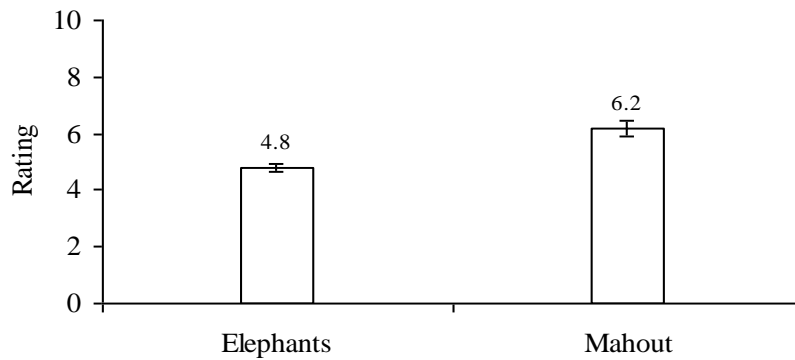
Mean wages for mahout was Rs. 17,218/ year (S.E. = 6.25, N = 22). Mean rating for Mahout's salary was 1.23 and Cawadi salary was 0.25. These two values indicate insufficient wages in each profession, as any value below 3 is considered poor. Mean rating values for Mahout and Cawadi education status were 7.06 and 6.87 respectively indicating a few years of schooling. Average number of children for mahout was 2 (S.E. = 0.10, N = 16) while average for cawadi was also 2 (S.E. = 0.16, N= 10).

Accommodation availability

The mean rating for Mahout and Cawadi for accommodation availability was 7.86 (SE = 0.159, N = 13) and 7.14 (SE = 0.368, N = 6) respectively.

Overall welfare status of temple elephants and their handlers

The overall mean rating for elephants across all the parameters observed was 4.8 (SE = 0.14, N= 967). The overall mean for mahout/ cawadi (calculated across each individual score for each parameter) was 6.2 (SE. = 0.26, N= 282). The welfare ratings for handlers may be different from the welfare ratings of elephants (Figure 8). This may suggest that the welfare status of Mahout/ Cawadi may be relatively better than that of the elephants.



Mahout: includes both mahout/ cawadi

Figure8: Comparison of overall mean rating between elephants and handlers

Discussion

Overall status of captive elephants in Temples of Tamil Nadu

1. Seventy five percent of the sampled elephants got an overall mean rating for 'shelter' parameter less than the group average of 3.81. Rating values less than three for individual elephants for shelter were observed for eight temples.
2. All the elephants had access to water. 76% of the elephants had access to stagnant sources of water, scoring less than 3 for this feature. 78% of the elephants scored less than 3 for the amount of water consumed indicating less than ideal consumption. 100% of the shelters used hard, unsuitable materials while bathing the elephants. 71% of the shelters used the elephant's enclosure as a bathing place also. Rating values less than three for water availability and use were observed for nine temples.
3. Hundred percent of the sampled elephants were reported to be allowed to sleep. However, 87% of the shelters scored 0 indicating provision of unsuitable sleeping place for its animals. Similarly, 82% of the shelters did not provide suitable resting place as seen in the score of 0.
4. 77% of the shelters were given a rating of 10 indicating provision of shade.
5. Ninety five percent of the sampled elephants had access to physical exercise by walking. However, one adult male elephant, had not been allowed to walk for six months (from March to August, upto the time of data collection) due to his aggressive behaviour.
6. Seventy seven percent of the elephants were trained to respond to more than ten commands.
7. Eighty five percent of the seven elephants observed did not have access to social interaction with other elephants.
8. Almost all the elephants (91%), were reported to be calm. However two elephants, male and female, were reported to be aggressive. Twelve elephants were reported to exhibit stereotypic behaviour with noticeable intensity showing a rating of less than three for individual elephants for occurrence of stereotypic behaviour
9. All the sampled elephants were given a score of 0 for type of work indicating the unnatural nature of work preformed by them. Also, most of the elephants (93%) scored less than 1 for work duration.
10. Ninety percent of the elephants were not allowed to forage for themselves.

11. All the sampled elephants were given a rating of less than two for chain related features such as: allowed to free-range or not, region of chaining, chain weight and chain length.
12. Only three of the sampled female elephants were reported to be in oestrus cycles, however, two of these elephants were not exposed to males.
13. Adherence to the prescribed veterinary schedule was given an overall mean rating of 9.84— indicating maintenance of a veterinary schedule for the observed period. At the time of this report, a 38y old female elephant had reportedly died.
14. All the temples had access to a veterinary doctor. But, 50 % of the doctors did not have experience with elephants.
15. Most of the mahouts (94%) and cawadis (72%) had a minimum of 10 years experience in the profession. However, there was significant variation in the years of experience that some Mahouts/ cawadis had in their profession.
16. Eighty six percent of the Mahouts and all the cawadis were given a rating of less than two for salary, indicating insufficient wages.
17. Sixty-three percent of the mahouts were reported to be using tools while making the elephants respond to their commands.

The overall mean rating, considering all the observed temples together, was 4.8 implying poor welfare conditions for the elephants. The data revealed absence of natural/ semi-natural conditions for the elephants among the observed temples. There was no provision for ecological and behavioral needs of elephants integral to their continued psychological and physical health: the vast space that elephants are known to traverse was limited to a maximum of just 0.1 acre among these elephants, they were provided with unsuitable flooring and confined within for more than ten hours per day; no provision for access to water when the elephants needed to drink/ bathe; all temples, except one, maintained their elephants singly, hence, all associated features of their social behaviour was absent in these temples; poor or absent reproductive functioning among adults either due to absence of oestrus or due to absence of members of opposite sex; the elephants' living conditions were characterized by features provided and controlled by people. Control by the elephants was minimal or absent.

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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 in alleviating suffering at the hands of humans. CUPA does not differentiate between pet, stray or wild animals, since all often require assistance and relief from cruelty, neglect and harm. The organization's objective has been to design services and facilities which are employed fully in the realization of these goals.

Asian Nature Conservation Foundation (ANCF) is a non-profit public charitable trust set 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 co-ordination with Government agencies, research institutions, conservation NGOs and individuals from India and abroad, in all matters relating to conservation of natural resources and biodiversity, endangered flora and fauna, wildlife habitats and environment including forests and wetlands. It participates and disseminates the procured information, knowledge and inferences in professional, academic and public forums.

Sahyog mainly deals with rescue of animals that are transported/ slaughtered illegally and takes action against cruelty to animals. People indulging in illegal cow slaughter were booked and the animals rescued, those transporting animals in violation of set norms were also booked. The organization is also involved in rescue and rehabilitation of wildlife used for entertainment/ trade. Snakes and pigeons, among other species, were rescued in the recent past. A circus performing in the city of Hyderabad was made to close its show following Sahyog's efforts; shops engaged in illegal wildlife trade were also closed down. The organization is also involved in creating awareness about animal issues.

Elephant Welfare Association (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.

Plant and Animal Welfare Society (PAWS) was established in 2001 by 4 youngsters with the mission to save urban wildlife, and help distressed domestic animals. The other activities of PAWS also include conducting awareness programs on animal rights, environmental Conservation & tree protection. PAWS has strength of 3 People's staff, 200 volunteers, 2 Ambulances for animal rescue and the team working tirelessly to help distressed animals & wildlife past 7 years. In first year PAWS helped around 600 animals, now PAWS helps more than 1,500 animals each year.

Hindu Religious and Charitable Endowment (HR&CE) Department, Government of Tamil Nadu: The Hindu Religious and Charitable Endowments Act, 1951 was enacted provincialising

the administration of the Hindu Religious Institutions. For a considerable period of time, including elephants, many species of animals have been considered to be integral parts of these institutions and the presence of different species signifies the cultural and traditional values the institutions. The department has evolved and also practicing specific management guidelines for these animals' upkeep and welfare.

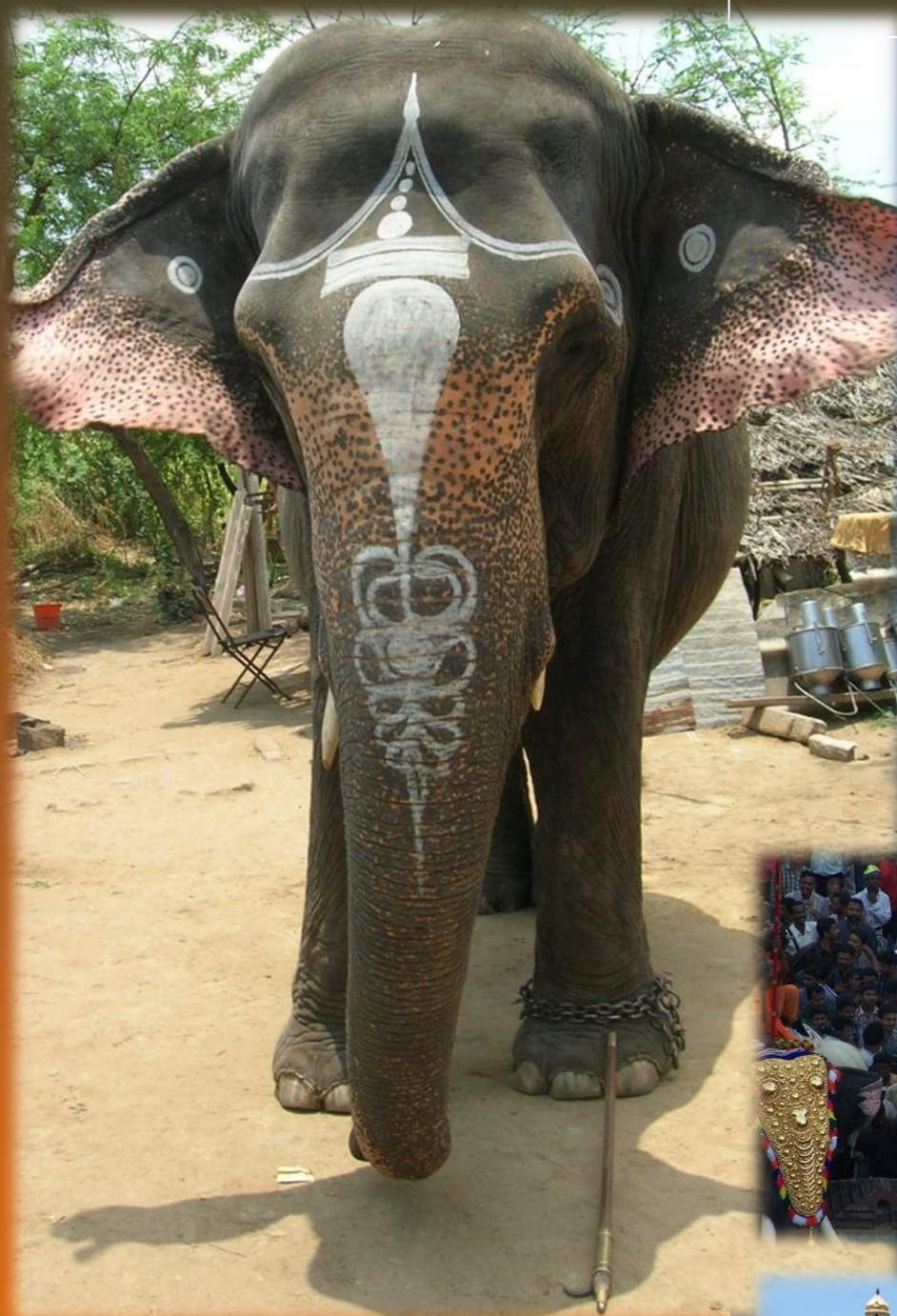
A.V.C College: In 1955, the Anbanathapuram Vahaira Charities [A.V.C] founded the A.V.C. College (Mayiladuthurai, Tamil Nadu) to serve cause of higher education and the reputed service of the college is well recognized throughout Tamil Nadu and other parts of our country. Presently, the Department of Wildlife Biology at the college has a research department conducting full time and part time in Doctor of Philosophy (Ph.D), Master of Philosophy (M.Phil) and Master of Science (MSc) programmes. The department has a reputation of initiating and successfully running many major and minor research projects in Wildlife Science and Conservation funded by reputed National and International funding agencies.

World Wide Fund for Nature (WWF) is one of the world's largest and most respected independent conservation organisations. Its mission is to stop the degradation of the plant's natural environment, which it addresses through its work in biodiversity conservation and reduction of humanity's ecological footprint. It has been working on these issues in India for over four decades now.

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 organizations in 153 countries. WSPA brings together people and organizations throughout the world to challenge global animal welfare issues. It has 13 offices and hundreds of thousands of supporters worldwide.

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This investigation on assessing welfare states of elephants kept under temples is based observing 267 elephants from 5 states in India. Here 15 welfare parameters name of few (source of the animal), purpose keeping, shelter, water, work, food, reproductive status, health care and mahouts) and their associated parameters were considered. The findings that are presented through this document are first of its kind, and hope to provide much needed insights on elephant-keeping in Karnataka.

