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An Investigation into the Welfare and Management Status of Elephant Mariappan of Samayapuram Mariamman Temple, Thiruchirapalli, Tamil Nadu, southern India

Surendra Varma and Ramesh Belagere

Elephants in Captivity: CUPA/ANCF - Occasional Report. 11

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Preface

Temples have a long history of keeping elephants for the many rituals or religious significances associated with them. However, there may or may not be any convincing evidences to help trace the significant cultural or religious reasons that motivate them to keep elephants. Investigations, on tracing the reasons are very important as these may be directly linked to the welfare of the animals kept there.

According to traditions, one of the reasons elephants are kept in temples is to bring water from the river nearby for daily sacred rituals associated with the deity or temple. The containers holding water are reported to be heavy and except for the elephant, no other mode of transportation can go up to the sanctum and sanctorum of the temple. If water has to be brought everyday or even only on specific occasions, then female elephants which are easy to handle and do not undergo the state of musth could be the right choice. In addition to this work, elephants in temples have no other role to play. However, maintaining elephants is a challenging task. Some of the temples that are not in a position to manage the resource required for maintaining elephants have, with or without their knowledge, permitted them to beg for food by way of blessing devotees. This has also helped the mahouts (elephant handlers) to generate additional income for themselves. Due to financial constraints, temples have no control over this aspect and without understanding the strains these animals undergo, this practice has continued.

A few specific circumstances have made some temples to keep male elephants. However, when they undergo the stage of musth, they are assumed to be aggressive. During this period, the elephant cannot be used for temple rituals and the mahout also, is unable to generate resources for himself. These aspects have made keeping male elephants in temples difficult and have led to their welfare being compromised. Elephant Mariappan is a classic example of a temple using a male elephant and involving circumstances that have led to the animal being tied in one location for a long period of time. Mariappan was brought to the temple when he was 7 ½ years old. He carried out tasks related to the temple without any difficulties until his first musth that was recorded at the age of 14 (years). Once musth started, problems associated with fulfilling temple duties, and issues between the mahout and the animal arose. According to the mahout, elephant Mariappan was aggressive towards him and attacked him once which led to the animal being chained for a prolonged period in one place.

The investigation into the current welfare status of elephant Mariappan is an attempt to identify the circumstances leading to this stage, to gauge the seriousness of the problem and to recommend the most practical way in which improvements can be brought about. A specific visit to the temple was undertaken in order to make direct observations of the animal. Details collected while studying Mariappan's welfare in 2005 were compared with the observations made during the present investigation.

During the investigation, it was found that the management of this elephant was based on the knowledge the mahout had and this knowledge had emerged by observing the animal.

Despite having vast experience (starting the profession at a very early age, father and forefathers being mahouts), circumstances led the mahout to adopt current ways of managing the elephant. Discussions were held with him to understand the issues associated with chaining the elephant for a long period. A meeting was held with the Joint Commissioner of the temple and it was possible to gain a positive signal as well as the administration's commitment to change the current welfare status of elephant Mariappan.

The data processing of the investigation was on a scale of welfare rating designed and critically reviewed by the expert. The document thus developed has two specific sections; the first provides background of the animal, consequences of prolonged chaining and exposure to hard substrates, efforts to release the elephant and the approaches adopted by the captive elephant research team to understand the issues, outcomes and recommendations.

Section 2 describes in detail the welfare status of elephant Mariappan through an executive summary and welfare parameters such as source of the elephant, shelter, availability of water, sleep, social interaction, walk, work, behavior of the animal, chaining method and duration, food and reproductive status of the animal. The results were compared with the acceptable standards of welfare and management. Mahout's socio-economical state has also been recorded.

It is important to note that a subsequent development, in the form of a notification issued by the Chief Wildlife Warden (CWW), Tamil Nadu, has brought in relief to the Elephant Mariappan. The notification states that Mariappan, maintained at Samayapuram Temple at Trichy, should be shifted to the Arignar Anna Zoological Park, Vandalur for further maintenance. The Order is deeply appreciated for the compassion and sensitivity it has shown, and it also provide scope for improving welfare status of other elephants like Mariappan, who may be caught in inappropriate situations

Overall, this investigation and the resultant document is an attempt to project the current status of male elephants kept in temples. The investigation also argues that male elephants should not be kept in temples and a critical review of keeping them in temples must be attempted. It is expected that this investigation and the findings would help in moving towards the aforesaid directions.

Acknowledgements

The authors and the captive elephant research team members are grateful to Mrs. Radha Swamy for bringing the situation of Mariappan to their notice. Though the animal had been on the Survey of Captive Elephants in Tamil Nadu report, the matter was thought to have been resolved. Her concern at the management of the elephant has greatly been the reason for further discussion and action.

We further thank Mrs. Bharathi, Joint Commissioner of the Samayapuram Temple, and Mr. Sukumaran, elephant Mariappan's mahout for their interactions with us and for allowing a healthy discussion on the subject of the elephant. Discussions with Thiruvanaikoil Temple elephant's mahout, Mr. Jambonathan, were very motivating.

The team is indebted to Ms. Sujata Srinivasiyengar, Ms. Lalitha Murali, Members of Mission Mariappan (initiated during the period of investigation) for helping to put the report and the concept together.

Section 1

Elephant Mariappan Of Samayapuram Mariamman Temple,
Thiruchirapalli, Tamil Nadu

Profile of Elephant Mariappan

Name of the Elephant	Mariappan
Age (in years)	23
Female/ Male	Male
Current location of animal	Samayapuram, Thiruchirapalli, Tamil Nadu
Makhna/Tusker	Tusker
Tusk type	Parallel
Source	Purchased
Date and year of source	23-08-1995
Age/height at source	7.5 years/194 cm
Location of origin	Top Slip, Anamalai, Tamil Nadu
Type of shelter	Closed
Type of flooring	Concrete/ stone
Source of water	Bore-well/ tap
Interaction with other elephants	Occasional with Elephant Kamala belonging to the Mahout
Interaction in hours/day	1
Number of elephants	1
Personality	Unpredictable
Number of people killed/injured	1 (Injured)
Stereotypic behaviour	Yes
Type of work	No work
Hours/day	Not applicable
Source of food	Stall fed
Type of food	Rice, ragi, sugarcane, green gram, dall with pepper
Status of 'musth'	Reported (first musth at 14years)
Number of calf sired	Nil
Type of disease reported	No
Availability of veterinary doctor	Yes
Number of mahout changed	No change

Mahout name	Sukumaran
Age (in years)	50
Community	Hindu
Mahout's experience (in years)	35
Total experience with this animal	17 years
Source of training	Experience
Mahout's father occupation	Mahout
Mahout's grand father occupation	Mahout
Education	10th Standard
Salary/year (in Indian Rupees)	60000
Job status	Permanent
Marital status	Married
Number of children	3
Type of tool used	Stick -angush
Health status	Good
Insurance	No
Source	NA
Will his children join this profession	Yes

Background

An adult tusker, Mariappan, has been maintained by the Mariamman temple in Samayapuram, Trichy (Thiruchirapalli) in Tamil Nadu since its shift from the Anamalai forest camp at the age of 7.5 yrs. The temple is administered by the Hindu Religious and Charitable Endowments department of the state. The elephant was brought to the temple to perform duties associated with the temple. Initially, the elephant was perceived to be normal and allowed to perform its duties. As it neared sexual maturity, during its pre-musth phase, the elephant showed signs of aggression. Circumstances forced it to be chained within a concrete room (Fig Ia and b) for the last seven years without any opportunity to walk or move out of its confinement.

(a) (b)

Figure 1a and b: Elephant Mariappan kept chained in a closed enclosure with concrete flooring for the last seven years

Consequences of prolonged chaining and exposure to hard substrates:

- The forefeet of elephants has a digitgrade structure and hind feet are semi-plantigrade (Mikota et al, 1994) implying weight bearing by the digits of the fore legs and sole & digits of the hind legs. Thus, an elephant that is severely restricted in its movement due to chaining cannot have a choice in its decision to shift weight from the fore/ hind legs by assuming suitable postures such as lying down/spreading its feet to suitable distance to distribute weight uniformly. Kurt and Garai (2007) suggest formation of deformed limbs to be a consequence of abnormal postures caused by chaining on uneven substrates. Restricting movement and/or keeping the elephant on cold, damp concrete surfaces is thought to lead to degenerative joint diseases in elephants (Mikota, et al., 1994).
- Abrasions caused by continuous chaining can result in skin cracks and wounds which are difficult to heal in elephants; chain scars occurred more on the hind feet as chains exert pressure when pulled by the elephant (Kurt and Garai, 2007).
- Chain injuries on legs were recorded in 60% of the observed zoos in the U.S. (Mikota et al., 1994)
- Overgrown nails/cuticles, excessive foot pad growth, are linked to inadequate exercise leading to poor wear and tear of the feet, necessitating regular feet

trimming procedures such as trimming of the pad, filing of the cuticle/ nails (Mikota, et al., 1994).

- According to Varma (2009) and Buckley (2008), captive elephants in natural habitats— large space with earthen natural substrate— required little foot care. According to the authors, joints stiffen in elephants made to stand for long periods on concrete; in a confined environment liquid waste from the elephant is difficult to remove, which can lead to infection. The rocking/ swaying stereotypic movements exhibited by elephants result in pressure on feet and nails with consequent tissue damage and thin foot pads.
- Non-human animals such as elephants undergo trauma in close confinement captive situations: such situations include loss of control by the elephant over its life, deprivation in the form of social isolation, chaining, restricted movement, among other features. Trauma is described as a form of stress in which the animal experiences a physical/ psychological event that is perceived to be life-threatening. Manifestation of such stressors include behavioural expressions such as stereotypy, increased aggression, etc (Bradshaw, 2007). The elephant Mariappan shows signs of aggression and stereotypy.
- Increased frequency of stereotypic behaviour was observed among elephants that were chained (both fore and hind legs) as compared to the same elephants being left loose in a fenced place (penned) (Friend, et al., 1999).
- The rear feet of "penned" elephants were cleaner and healthier as the elephants' excreta (dung/ urine) did not accumulate around their feet (Friend, et al., 1999). Unhygienic/ unsanitary conditions of the tethering site were said to be one of the pre-disposing factors for foot ailments such as pododermatitis/ abscesses/foot-rot (Subramaniam et al., 2010). Severe and chronic cases of foot/leg problems in elephants in zoos have led to euthanasia of some elephants: of the sixteen captive Asian elephants euthanized in a span of ten years (1977-1987) in the U.S., nine were euthanized due to severe pododermatitis (Mikota, et al., 1994).
- The study by Friend et al., (1999) observed penned elephants appearing to be more relaxed— a previous study (Delmeier, et al., 1985) on confined calves (Holstein bulls) showed such calves performing increased locomotor behaviours as compared to those which were left free in a yard.

In a study of foot problems, most number of foot ailments, considered to be major, were observed for elephants in temples of Tamil Nadu (Subramaniam et al., 2010). The same authors suggest the practice of keeping elephants on hard substrates to be a cause for foot ailments which initially appear as minor problems and can, if neglected, lead to major ailments of the foot.

The elephant Mariappan continues to be chained in its shelter in the temple, day and night, till date.

- Knowledge of elephant behaviour and biology was gained by observing a captive animal in close proximity. All the information on elephants, thus gained, was then used to manage the elephant

- Continuous and prolonged chaining of the male elephant without any exercise whatsoever was resorted to as a way of controlling the animal. Obvious and overt damage to the animal by this act was not noticed.
- Serious consequences of long-term chaining and lack of exercise on the physical and psychological health of the elephant were not known.

Efforts to release the elephant:

- The temple administration and Mariappan's mahout were, unfortunately, held solely responsible for the situation of the elephant being in chains without any recourse to walk. General public and other mahouts (working in temples in surrounding areas) also did not approve of Mariappan's mahout's actions and some opined that male elephants could be maintained without being in chains. The circumstances and the opinions on Mariappan's mahout made no negotiations possible.
- Overt signs of health and body condition of elephant Mariappan may have been used as positive indicators of absence of a problem; however, the damage to the psychological profile of the fettered animal and to the structure of the legs made to bear the massive weight of its body without recourse to free and unhindered movement on natural substrates would have become visible as the animal grew older.

Approach adopted by the captive elephant research team to understand the issue:
The following strategy was used:

- A dialogue with the temple administration and elephant's mahout (Fig 2a and b) was initiated to understand the basic issue for the elephant's chained situation

(a) (b)

Figures 2a and b: Discussions with the temple administration and elephant Mariappan's mahout

- Problem or constraint enforced on both temple administration and the mahouts was mapped
- Provided knowledge about elephant biology and behaviour by the expert to the mahout; and to the temple administration by explaining long term implications of

continuous chaining on the elephant's life, on the mahout's and his family's life in the event of an accidental injury by the elephant

- In the event of the mahout agreeing to let go of the elephant, to look for suitable alternative sites for the elephant in the same region or elsewhere by collecting details of other temples suitable for the elephant
- Initiate dialogue with institutions to move the animal to a suitable location; develop a protocol for the transfer

Outcome:

a) Information was recorded from the mahout, and awareness on the negative aspects of long-term chaining of elephants was provided; mahout agreed that the elephant should be shifted
b) Temple administration was willing to provide all support to transfer the elephant
c) Initial location of transfer was also identified within the region in a temple where a female elephant had recently died. The mahout of this elephant appeared to be knowledgeable about certain aspects of elephant keeping.
d) A notification issued by the Chief Wildlife Warden (CWW), Tamil Nadu, has brought in respite for Elephant Mariappan. The Order states that Mariappan, maintained at Samayapuram Temple at Trichy, to be shifted to the Arignagar Anna Zoological Park, Vandalur for further maintenance. The costs of maintenance to be borne by the Tamil Development Endowment, Hindu Religious Charity Endowment and Information Department (see Figure 3a and b for the notification). It's important to note that an investigation carried out to assess the status of Asian elephants in Indian Zoos (Varma, et al., 2008) indicates mean welfare rating of 6 with a deviation of only 31% from expert rating. Among all the zoos studied, the minimum deviation was observed for Bannergatta Biological Park and Zoo, Karnataka followed by Arignagar Anna Zoological Park, Vandalur, Tamil Nadu.

TAMILNADU FOREST DEPARTMENT

From
Thiru. R. Sundararaju, I.F.S.,
Principal Chief Conservator of Forests
and Chief Wildlife Warden,
Panagal Building, Saidapet,
Chennai –600 015.

To
The Special Commissioner,
Tamil Development
Endowment, Hindu Religious
Charity Endowment and Information
department, Nungampakkam High
Road, Chennai 600 034.

C.No.WL6/57014/2009 dated 20-10-2010.

Sir,

Sub: Shifting of male elephant maintained in Samayapuram Temple at Trichy to Arignar Anna Zoological Park, Vandalur.

Ref: GO.Ms No. 35 Tamil Development Endowment, Hindu Religious Charity Endowment and Information(H.R1-1) department dated. 15.02.2008.

I wish to inform that it is decided to shift the male elephant named Mariappan maintained in Samayapuram Temple at Trichy to Arignar Anna Zoological Park, Vandalur for further maintenance. I therefore request you to inform to the concern officers of the Samayapuram Temple to hand over the elephant to the Chief Conservator of Forests & Director, Arignar Anna Zoological Park, Vandalur, Chennai immediately under proper TCR. The elephant should be shifted to Vandalur at the cost of Tamil Development Endowment, Hindu Religious Charity Endowment and Information department.

Sd/- R. Sundararaju
Principal Chief Conservator of Forests &
Chief Wildlife Warden.

Copy to Joint Commissioner, Arulmigu Samayapuram Mariamman Temple, Trichy.

Copy to Chief Conservator of Forests & Director, Arignar Anna Zoological Park, Vandalur.

The Chief Conservator of Forests & Director is informed that the Central Zoo Authority of India in their letter No. 26-1/210 dated. 12.10.2010 has informed that the male elephant may be housed in off-exhibit area of the Arignar Anna Zoological Park, Vandalur. I therefore request that the male elephant may be received from Samayaburam Temple and maintain in Arignar

Anna Zoological Park, Vandalur. He may also claim maintenance charges from Central Zoo Authority towards the maintenance of elephant. The Government in its GO (MS) No. 35 Tamil Development Endowment, Hindu Religious Charity Endowment and Information (H.R1-1) department, dated 15.02.2008(copy of the GO is enclosed for ready reference) has issued orders to obtain funds from the Government under the head of account.

2406 Forestry and Wildlife – 01 Forestry - 101 Forest Conservation, Development and Regeneration - I Non Plan - AA Upkeep of Department animals.

(D.P. Code 2406-01-101-AA-0001)

Copy to District Forest Officer, Trichy.

The District Forest Officer is requested to arrange to shift the elephant from Samayapuram to Arignar Anna Zoological Park, Vandalur under the technical supervision of Forest Veterinary Officer, Coimbatore.

Copy to the Conservator of Forests, Trichy.

Copy to Thiru. N.S. Manoharan, Forest Veterinary Officer, Coimbatore (through Conservator of Forests, Coimbatore).

Copy to Conservator of Forests, Coimbatore.

Sd/- R. Sundararaju
Principal Chief Conservator of Forests &
Chief Wildlife Warden.

True Copy // By Order

Superintendent 2010

Figures 3a and b: Notification issued by the Chief Wildlife Warden (CWW), Tamil Nadu, to shift Mariappan, maintained at Samayapuram Temple at Trichy, to the Arignagar Anna Zoological Park, Vandalur for further maintenance

Recommendation:

1. The order issued by the CWW, Tamil Nadu should be implemented as soon as possible.
2. Mariappan could be initially shifted to Sri Jambukeswarar Akilandeswari of Thiruvanaikoil (Fig 3a, b, c and d) situated 3km from Trichy. Certain modifications need to be implemented such as provision of large physical space, not exposing the elephant to concrete/hard surfaces, eventual removal of chains, regular walks (during early morning or late evening) and gradually exposing the elephant to a balanced nutrition and diet(not providing sweets/ fruits).

a

b

Figure 4a, and b: Research team at the proposed relocation site of Elephant Mariappan; dialogue with the mahout of Thiruvanaikoil (a), open enclosure with concrete flooring (b)

c

d

Figure 4 c and d: open enclosure with mud flooring (c); day time enclosure with sand flooring (d)

3. Continuous and prolonged chaining of any elephant and the use of all elephants for activities such as blessing/begging from the public should be banned. Efforts

should be made to bring together elephants living in proximity in different temples to a central point which has natural conditions like large open spaces, natural and varied vegetation, and streams/lakes as water source. This would be a step towards improving and setting minimum welfare standards and providing them with an opportunity to interact with other elephants.

4. The Chief Wildlife Warden's Order and the recommendations of this document is in conformity with the vision of the Elephant Task Force which in its report "Gajah" (August 31, 2010 Ministry of Environment and Forests) has stated....." Conservation policies that may diminish the status of the captive elephant should effectively integrate them into India's wildlife protection laws. This is especially important given that the vast majority of captive elephants today were born in the wild and subsequently taken into captivity. It fully recognizes the role of captive elephants in various living cultures and traditions. In keeping with the best in these very cultures, it cannot compromise on the welfare, health, safety and up keep of these animals".

Section 2
Welfare Assessment of Elephant Mariappan

Executive Summary

Arulmighu Mariamman temple in Samayapuram, Trichy, southern India, maintains an elephant, a 23y old male, named Mariappan in its premises since its transfer here from the Anamalai forest camp in the mid 90s at the age of 7.5y.

A review of the welfare status of the elephant is presented here, based on data collected by the captive elephant research team during their visit in October 2010. This investigation also compares the welfare status of the same elephant surveyed during the All India Captive Elephant Survey, 2005.

The data collected during both the period was subjected to a rating logic, developed and reviewed by experts. The existing welfare conditions have been rated in terms of their suitability to elephants using Expert Rating and compared the same with the mean rating M-R derived from the ground investigation.

The elephant was born in captivity in the Anamalai Forest camp; sold to the temple when it was 7.5y old. M-R for the source elephant was 1.5 indicating a deviation of 75% from E-R.

The elephant was confined to its concrete-based room day and night, the flooring was concrete, shade was available in the form of a concrete roof, and maintenance of hygiene in the shelter was moderate. M-R for shelter and associated parameter was 1.8 implying a deviation of 78% from E-R.

Bore-well water was provided implying inaccessibility of clean free-flowing water to the elephant. Although a small stream of water flows next to the shed where Mariappan is tied, this is assumed to the water source for the elephant as well as for the temple visitors. Evidences of this stream being used for death rituals of humans were found during the visit. M-R was 3.5 with a deviation of 56% from E-R.

The elephant was maintained in social isolation. The male elephant did not have any opportunity to interact with the two female elephants maintained by the mahout. M-R was 0.0, showing 100% deviation from M-R.

The elephant was described as a “little agitated”. The elephant had reportedly tried to attack its mahout once, the animal showed high intensity of stereotypic behaviour of “head bobbing” and it seems to react to every unusual sound and new comers. M-R was 1.5 showing a deviation of 81% from E-R.

Work used to be carrying water to the temple deity, the time used to be 9a.m.to11a.m and the elephant was not given any work following his chaining. M-R was 8.0 showing no deviation from E-R.

The elephant was chained 24h/day. Both hind legs and one fore leg was chained, the chain length for the hind legs was less than 2m. M-R was 0.0 indicating complete deviation (100%) from E-R

Only stall feed was provided to the elephant, no grazing/ browsing opportunity was allowed. Food provided included: Rice (*Oryza sativa*)-12kgs, Green-gram (*Vigna radiata*)-2kg, horse-gram (*Dolichos biflorus*) – 2 kg, *kel varagu* (ragi - *Eleusine coracana*) - 4kg, a combination of millets and dry ginger (*Zinziber* sp.) powder and pepper- 50gms, Jaggery (unrefined sugar)- 200gms, gingelly oil (*Sesamum indicum*) – ¼ litre. During musth, food included banana (*Musa* sp.) stems, water melon (*Citrullus lanatus*) and cucumber (*Cucumis sativus*); horse-gram and green-gram were not given. M-R was 2.8 with a deviation of 69% from E-R.

The elephant showed signs of musth, duration was 90days; first musth occurrence was at the age of 14 yrs, and it was exposed to females occasionally; had not mated/ sired offspring. It was said to be aggressive during its musth and chained during that period, practice of chaining continued even after the musth period. M-R was 3.3 showing a deviation of 75% from E-R.

The mahout handled elephants since his childhood and experience with this particular elephant was since its arrival at the temple. The mahout's family occupation involved handling elephants, both his sons also handled elephants. There was no insurance cover for the mahout. Tools used to control the elephant included: *valliakol*, metal ankush and stick, similar to those employed by mahouts in Kerala. Overall M-R for mahout welfare was 6.8 showing a deviation of only 15% from E-R.

The overall M-R for the elephant was 2.0 implying a deviation of 75% from norms considered acceptable by experts. In 2005, the overall M-R for this elephant was 2.6 showing a deviation of 67% from E-R. Thus, the welfare status of the elephant was comparable to that observed in 2010. Additionally, with an increase in the number of parameters observed, the rating in 2010 appears to have reduced further.

Introduction:
Arulmighu Mariamman temple in Samayapuram is located 15kms from Trichy (Thiruchirapalli), along the Chennai-Trichy highway. This temple maintains an elephant, a 23y old male, named Mariappan in its premises since its transfer here from the Anamalai forest camp in the early 90s at the age of 7.5y. The elephant was brought to the temple for performance of duties associated with the temple: to bring water from river for the temple deity, to stand in temple premises to offer blessings to the public, etc. A handler, Mr. Sukumaran, has been taking care of the elephant since its arrival and is employed by the temple; the temple provides food for the elephant.

A review of the welfare status of the male elephant, Mariappan, of the Samayapuram temple in Trichy is presented here. This knowledge is based on data collected (Fig Ia and b) by the captive elephant research team during their visit in October 2010. This investigation also compares the welfare status of the same elephant surveyed during the All India Captive Elephant Survey, 2005.

Objective:
The shift from natural conditions experienced by elephants in captivity may vary from one location to another, resulting in varying environments for the animals. This report aims to:

- Assess the welfare status of the elephant by considering the physical/social and reproductive condition in captivity
- Assess the professional experience and socio-economic status of elephant handlers as they form an integral part of a captive elephant's life

Method:
The biological and ecological needs of captive elephants, which are no different from those of wild elephants, are integral to their welfare; these animals have not been selectively bred in captivity to modify their behaviour in consonance with those of human needs. Hence, welfare has been measured by comparing captive conditions with those observed in the wild in terms of the physical, social, psychological and reproductive aspects. The existing conditions have been rated in terms of their suitability to elephants.

(a) (b)

Figure 1a and b: Data collection; through direct observation of elephant Mariappan (a) and interaction with elephant Mariappan's mahout (b)

Rating method:

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

- The experts, based on their concept of importance of a particular parameter to an elephant, developed a rating for each parameter. For example mean expert rating of 8.0 (SE= 0.5, N=29) for a parameter 'floor' and 9.0 (SE=0.4, N=31) for 'source of water' was arrived at from the ratings suggested by each expert by averaging across all the experts' values.
- A mean rating for each parameter, across all the participating experts, has been used as the Experts' Rating (E-R) which represents the importance attached to a parameter i.e., for a parameter with 8.0 as the maximum value, only 2.0 (20%) deviation and parameter with maximum value 9.0 only 1.0 or 10% from the prescribed norm is considered acceptable.
- For example, if an elephant is exposed only to natural flooring, the animal receives a rating of 8 and for entirely unnatural flooring the value is 0; if animal is exposed to both natural and unnatural flooring, the value is 4 (as 8+0/2= 8/2= 4). If an elephant is exposed to a natural water source, such as a river, it receives a value of 9; if the source of water is large lakes or reservoirs, it gets 4.5. A value of 2.25 is assigned for small water bodies like tanks and ponds. Tap water (running) gets 1.125 and if only buckets, pots, and tankers are in use, then the allocated value is 0.5. This rating is then averaged across all individuals in that institution to get a Mean Rating (M-R) for that feature. Thus M-R represents the actual situation existing for the elephant/s.
- Therefore, using the maxima given by experts as a base, a rating scale starting from zero to the particular maximum value for that parameter has been used and the data for each animal was collected, in a given regime (for example, forest camp or temple).
- In this investigation, variables which represent a common feature of the captive condition have been grouped to form a parameter. The variables have been termed sub-parameters. For example, the variables shelter type, shelter size, floor type in the shelter; all represent different aspects of the physical space provided to the elephant. Hence, they are grouped together to form the parameter "Shelter" and each constituent variable is a sub-parameter. In this investigation, the E-R for a parameter (say, shelter) represents the mean of E-Rs across all related sub-parameters. The Mean Rating (M-R) for a parameter is the mean of M-Rs across related sub-parameters and denotes welfare status of existing conditions on the ground for the particular parameter.
- The number of such related parameters (sub-parameters) varies for each regime.

- Results have been presented comparing E-R and M-R as a means of comparing the extent of deviation present in the parameters observed. The difference between E-R and M-R (expressed as percent) indicates deviations from the prescribed norm.
- For handlers, the difference between the maxima provided by experts (E-R) and existing status (M-R) have been used to indicate the professional/ socio-economic status of value to the handler and his elephant.
- Graphs have been presented comparing the rating for each of the parameters observed in 2005 with those of 2010.
- N* refers to number of sub-parameters observed.

Results:

Source

Elephants experience change in their living conditions when they are moved across locations, this is all the more valid when a change of management systems is involved. Translocated African elephants showed higher glucocorticoid levels (Millspaugh, 2007); increased glucocorticoid levels are considered to be one of the indicators of stress.

- The elephant was born in captivity in the Anamalai Forest camp; sold to the temple when it was 7.5y old

M-R was 1.5 indicating a deviation of 75% from E-R.

Shelter

Male elephants, in the wild, are known to range over larger areas than females (Fernando et al., 2008). In general, home-range size varies from 250-1000km^2 in India (Sukumar, 2006) depending on habitat quality.

Fig 2. Closed shelter of elephant Mariappan (note: concrete floor)

- The elephant was confined to its concrete based room day and night
- Flooring was concrete (Fig II)
- Shade was available in the form of a concrete roof
- Ventilation to the shed was poor. Light was falling on the elephant from three patches of broken shed
- Maintenance of hygiene in the shelter was moderate

M-R was 1.8 (SE= 1.3, N*= 7) implying a deviation of 78% from E-R. Figure 2 gives the comparative rating for shelter for 2005 and 2010. There is no difference in the rating for shelter across the observed years due to the overlapping variance. Figure 3 and 4 give the rating for the year 2010

only.

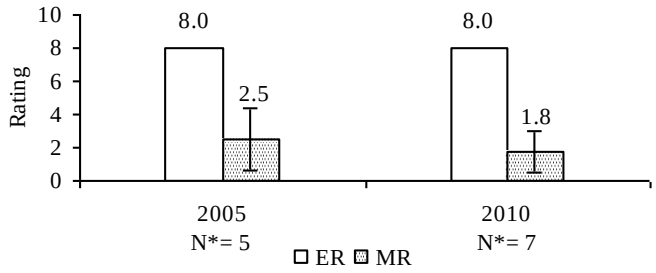


Figure 2: Comparison of rating for shelter across years

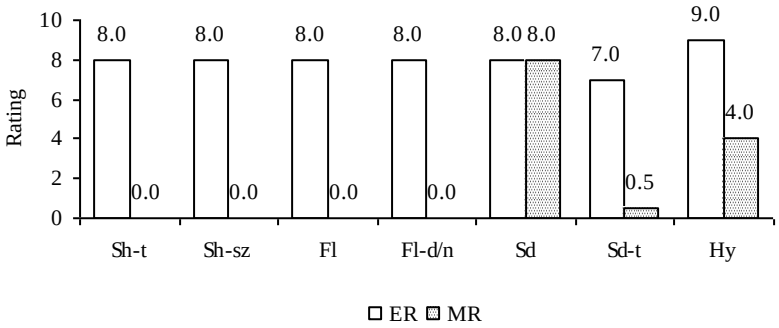
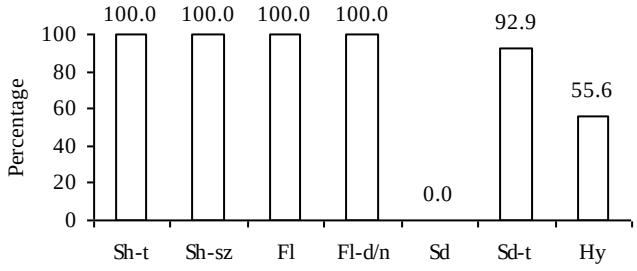


Figure 3: Comparison of E-R and M-R for shelter (2010)



Sh-t: Shelter type Sh-sz: Shelter size Fl: Flooring Fl-d/n: Flooring (day/night)
Sd: Shade availability Sd-t: Shade type Hy: Maintenance of hygiene

Figure 4: Percent deviation from E-R for shelter (2010)

Water

Elephants use water as a way of thermo-regulation (McKay, 1973), in addition to consumption. Thus, water sources which provide easy access to the animal when needed are important.

- Bore-well water was provided implying inaccessibility of clean free-flowing water to the elephant
- Water for drinking was provided 3-4 times/ day
- Bath frequency was once/day, bathing duration was 3h; materials used were brush and stone
- Small stream of water flows next to the shed where Mariappan was tied. This is assumed to be the water source for the elephant and temple visitors (Fig 5a and b). Evidences of this stream being used for death rituals of humans were found during the visit

(a) (b)

Figure 5a and b: One of the sources of water for elephant Mariappan, note the evidence for the source being utilized for other activities

M-R was 3.5 (SE= 1.0, N*= 6) with a deviation of 56% from E-R. Figure 6 gives the comparative rating for shelter for 2005 and 2010. Though the 2010 rating for water showed improvement, deviation from prescribed norms was more than 50%. Figure 7 and 8 give the rating for the year 2010 only.

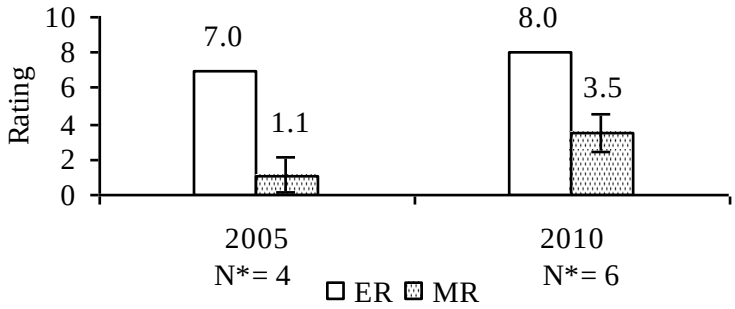


Figure 6: Comparison of rating for water across years

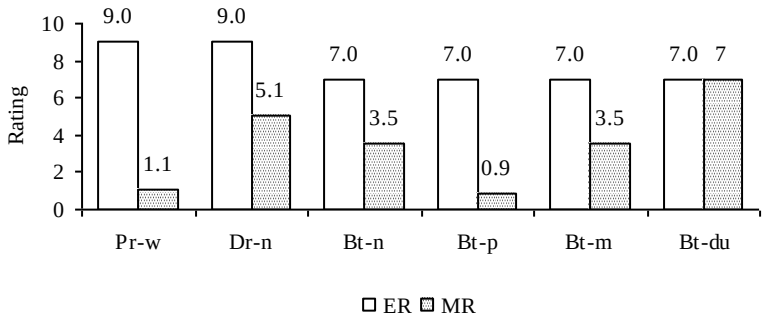
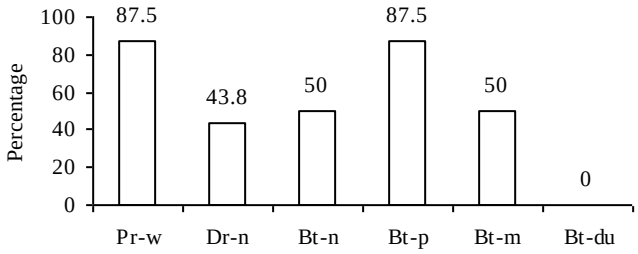


Figure 7: Comparison of E-R and M-R for water (2010)



Pr-w: Occurrence of perennial source of running water Dr-n: Drinking water (number of times)
Bt-n: Bathing (number of times) Bt-m: Bathing materials Bt-du: Bath duration

Figure 8: Percent deviation from E-R for water (2010)

Sleep

Suitable surface and sufficient space are important parameters for improving captive conditions while sleeping.

- The elephant was chained by its fore and hind legs; thus sleep area was severely restricted
- Shelter formed the sleeping place also
- Duration of sleep was 3h

M-R was 2.2 (SE= 2.4, N*= 3) showing a deviation of 73% from E-R. Figure 9 gives the comparative rating for shelter for 2005 and 2010. The rating for sleep, in 2005, was based only on its occurrence; hence there was no deviation from E-R. The rating in 2010 showed mean rating which deviated from E-R by nearly 75%. Figure 10 and 11 give the rating for the year 2010 only.

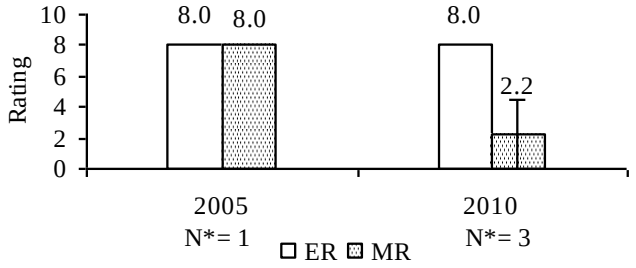


Figure 9: Comparison of rating for sleep across years

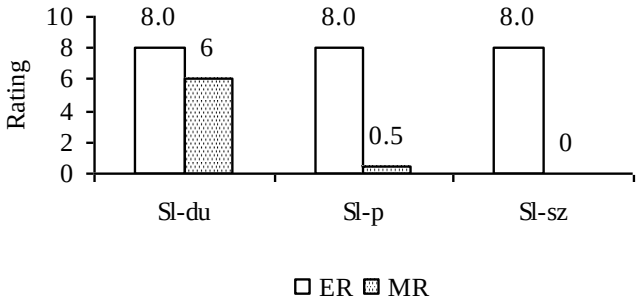


Figure 10: Comparison of E-R and M-R for sleep (2010)

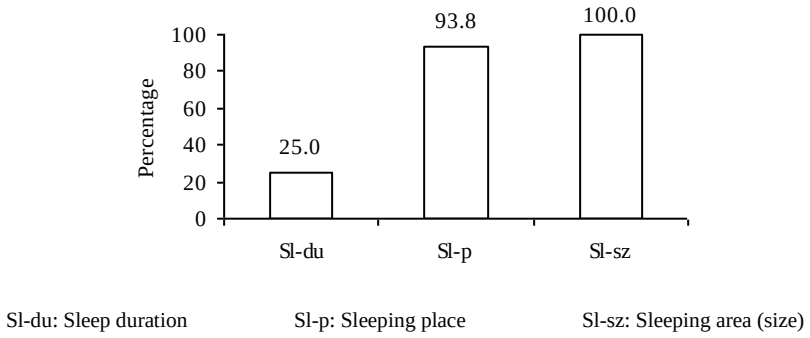


Figure 11: Percent deviation from E-R for sleep (2010)

Social interaction

McKay (1973) observed non-negative interaction among wild male elephants. Poole and Granli (2009) state young males interact with others in order to know the strength and weakness of other males, useful while competing for females. Males disperse from their natal herds when they are 10-15y old, adult males living solitarily or associating with female herds/ forming bachelor groups (Vidya and Sukumar, 2006). This would imply a degree of social interaction prevalent among adult males also.

- The elephant was maintained in social isolation
- The male elephant did not have any opportunity to interact with the two female elephants (Fig 12a and b) maintained by the mahout

(a) (b)

Figure 12a and b: Two female elephants maintained by elephant Mariappan's mahout that do not interact with the adult tusker

M-R was 0.0, (N*= 1) showing 100% deviation from M-R. Figure 13 gives the comparative rating for shelter for 2005 and 2010. The situation was no different in 2005, as seen in the graph.

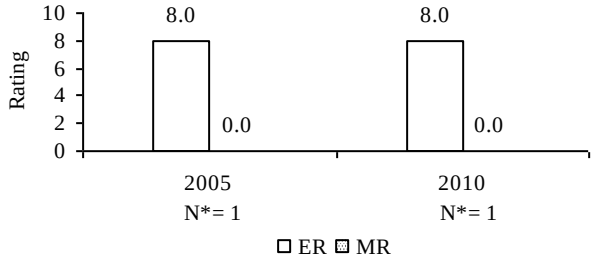


Figure 13: Comparison of rating for social interaction across years

Walk

Walking on suitable substrates forms a key issue for elephants in captivity as inadequate exercise can lead to foot and leg problems (Olson, et al., 1994), excessive weight gain and absence of suitable psychological stimulation in the event of a barren environment.

- The elephant was not taken for walks for the past several years, since its chaining following an aggressive episode

M-R was 0.0 (N*=1) showing complete (100%) deviation from E-R. Figure 14 gives the comparative rating for shelter for 2005 and 2010. The situation was no different in 2005, as seen in the graph.

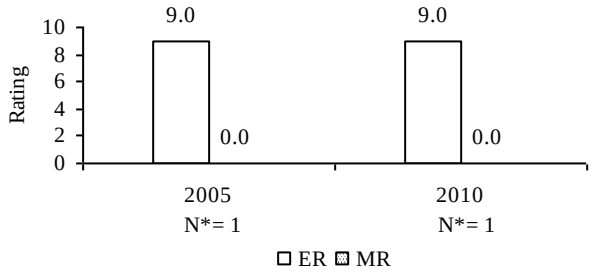


Figure 14: Comparison of rating for walk across years

Observed Behaviour

The temperament of an animal is a factor in determining response to handling by people causing greater stress to the animal when handled roughly (Grandin, 1997). In addition, occurrence of stereotypic behaviours can be considered to be an indicator of poor welfare conditions (existing/ previous).

- The elephant was described as a "little agitated"
- The elephant had reportedly tried to attack its mahout once
- The animal showed high intensity of stereotypic behaviour of "head bobbing"
- The animal seems to react to every unusual sound and new comers.

M-R was 1.5 (SE= 1.7, N*= 4) showing a deviation of 81% from E-R. Figure 15 gives the comparative rating for shelter for 2005 and 2010. Based on the variation observed for the two years, it is evident that there is difference in behaviour for the parameters observed. Figure 16 and 17 give the rating for the year 2010 only.

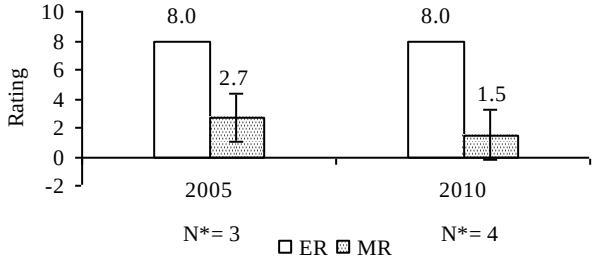


Figure 15: Comparison of rating for observed behaviour across years

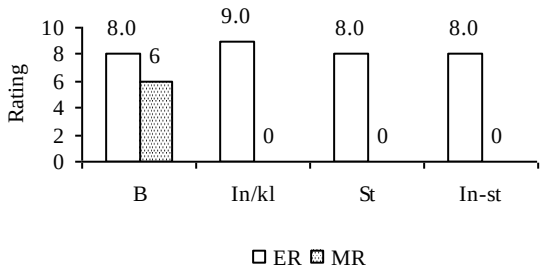
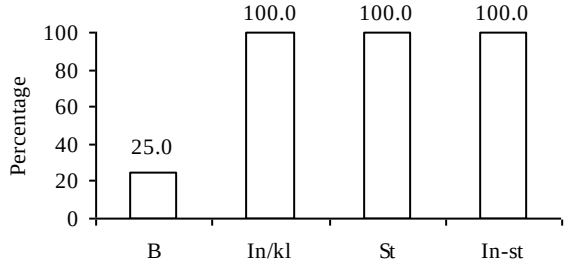


Figure 16: Comparison of E-R and M-R for behaviour (2010)



B: Observed behaviour (temperament) In/kl: incidence of killing/ injury St: Occurrence of stereotypy
In-st: Intensity of stereotypy

Figure 17: Percent deviation from E-R for behaviour (2010)

Work

In captivity, elephants may perform work consistent with their natural behaviour like walking in natural conditions (patrolling forests) or performing unnatural behaviours such as blessing or standing stationary for hours. Thus, work in a suitable environment may be psychologically stimulating.

- The elephant used to work from 9a.m.to11a.m.
- Work type was carrying water (drawn from a bore-well) to the temple deity
- The elephant was not given any work following his chaining

M-R was 8.0 (N*= 1) showing no deviation from E-R. Figure 18 gives the comparative rating for shelter for 2005 and 2010. The situation was no different in 2005, as seen in the graph.

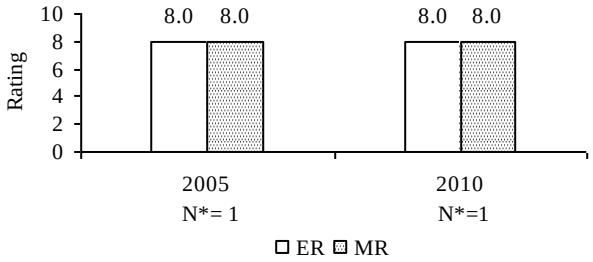


Figure 18: Comparison of rating for work across years

Chaining

Gruber, et al., (2000) observed increased stereotypic behaviours in chained elephants.

- The elephant was chained 24h/day
- Both hind legs and one fore leg was chained (Fig 19a and b)
- Chain length for the hind legs was less than 2m

(a) (b)

Figure 19a and b: Type of chain used (note that three legs are chained)

M-R was 0.0 (SE= 0.0, N*= 4) indicating complete deviation (100%) from E-R. Figure 20 gives the comparative rating for shelter for 2005 and 2010. There was no difference in the overall rating across the observed years. Figure 21 and 22 give the rating for the year 2010 only.

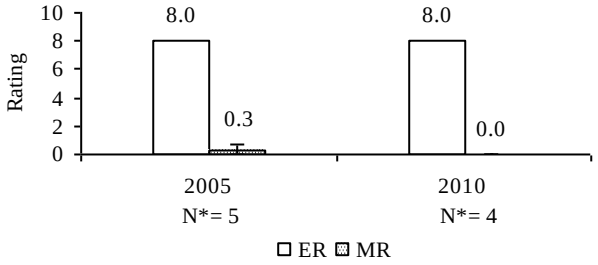


Figure 20: Comparison of rating for chaining across years

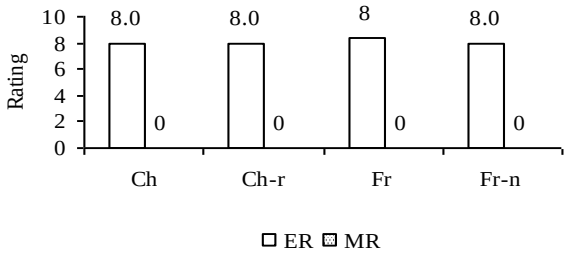
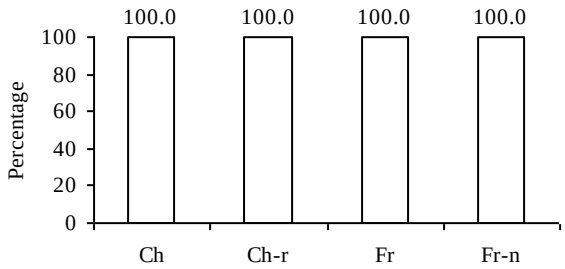


Figure 21: Comparison of E-R and M-R for chaining (2010)



Ch: Chaining status Ch-r: Region of chaining Fr: Opportunity for free-ranging
Fr-n: Opportunity for free-ranging at night

Figure 22: Percent deviation from E-R for chaining (2010)

Food

A major activity for wild elephants involves foraging, occupying most parts of a day (Sukumar, 2006), feeding on diverse plant types and plant parts. In captivity, stall feed cannot replicate the diversity of vegetation consumed by wild elephants and there is no opportunity to forage as the stall fed animals are confined.

(a) (b)

Fig. 23 a and b: Source of food (stall fed) - examples of food provided; sugarcane (a) and fruits (b)

- Only stall feed (Fig 23 a and b) was provided for the elephant, no grazing/ browsing opportunity was allowed
- Food provided included: Rice (*Oryza sativa*)-12kgs, Green-gram (*Vigna radiata*)- 2kg, horse-gram (*Dolichos biflorus*)- 2kg, *kel varagu* (*Eleusine coracana*)- 4kg, a combination of millets, dry ginger (*Zinziber* sp.) powder and pepper- 50gms, Jaggery (unrefined sugar)- 200gms, gingelly oil (*Sesamum indicum*) – ¼ litre.

- During musth, food included banana (*Musa* sp.) stems, water melon (*Citrullus lanatus*) and cucumber (*Cucumis sativus*); horse-gram and green-gram were not given

M-R was 2.8 (N*= 2) with a deviation of 69% from E-R. Figure 24 gives the comparative rating for shelter for 2005 and 2010. Variation was observed for M-R of 2005, but the M-R of 2010 was based on two sub-parameters only; despite this the deviation from E-R was close to 50% even in 2005. Figure 25 and 26 give the rating for the year 2010 only.

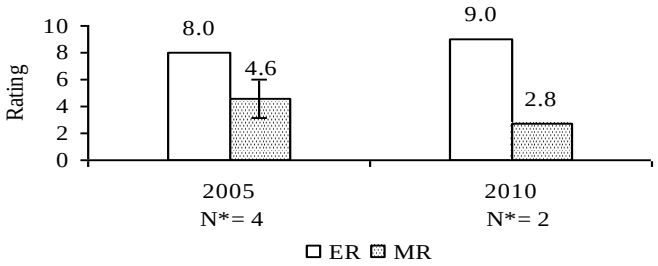


Figure 24: Comparison of rating for food across years

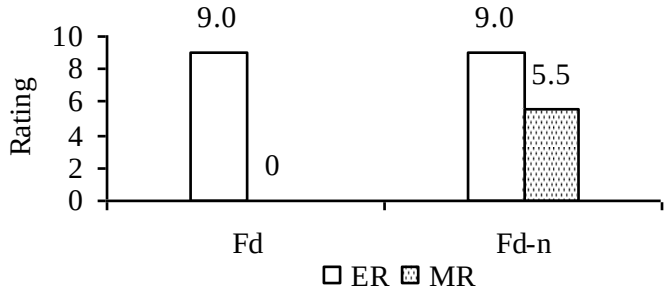
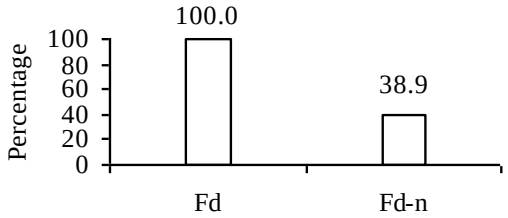


Figure 25: Comparison of E-R and M-R for food (2010)



Fd: Food provisioning type Fd-n: Number of stall fed items

Figure 26: Percent deviation from E-R for food (2010)

Reproductive status

Reproductive phase among males shows occurrence of musth, search for females, competition among males, mating by the dominant male with an oestrus female. In captivity, this period of musth, is usually observed by confinement of the elephant/s.

- The elephant showed signs of musth, duration was 90days; first musth occurrence was at the age of 14y
- The elephant was exposed to females occasionally; had not mated/ sired offspring
- It was said to be aggressive during its musth
- Chained during musth, practice of chaining continued after musth period also

M-R was 3.3 (SE= 1.5, N*= 6) showing a deviation of 75% from E-R. Figure 27 gives the comparative rating for shelter for 2005 and 2010. The 2005 rating was based on occurrence of musth only, hence a high rating is observed. Figure 28 and 29 give the rating for the year 2010 only.

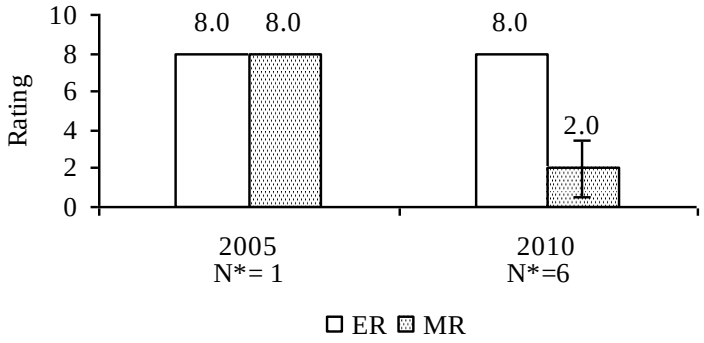


Figure 27: Comparison of rating for reproductive status across years

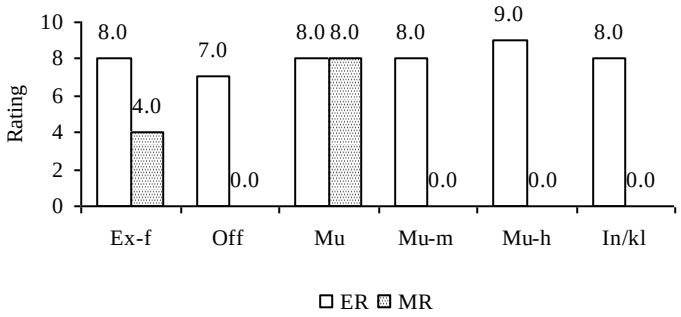
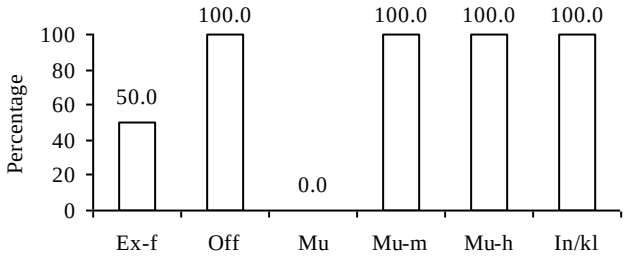


Figure 28: Comparison of E-R and M-R for reproductive status (2010)



Ex-f: Exposure to females Off: Offspring sired Mu: Occurrence of musth
Mu-h: Handling of musth In/kl: Injured/ killed during musth

Figure 29: Percent deviation from E-R for reproductive status (2010)

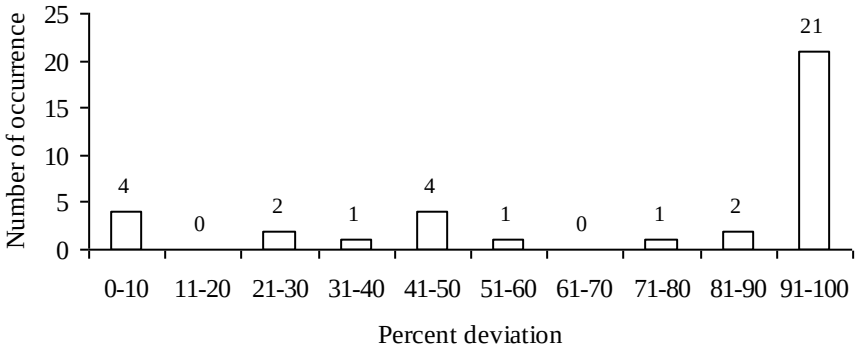


Figure 30: Distribution of percent deviation from E-R for observed parameters

Mahout

In captivity, an elephant's life is decided by actions or decisions taken by the mahout/s in terms of the animals' husbandry and management. Thus, a mahout's experience in this profession as well as his social background may influence the decisions made by him.

- The mahout handled elephants since his childhood
- Experience with this particular elephant was since its arrival at the temple
- The mahout's family occupation involved handling elephants, both his sons also handled elephants (Fig 31 and 32)
- The mahout had been educated up to class 10
- Salary drawn was Rs. 5000/- per month
- There was no insurance cover for the mahout
- Tools used to control the elephant included: *valliakol*, metal ankush and stick, similar to those employed by mahouts in Kerala

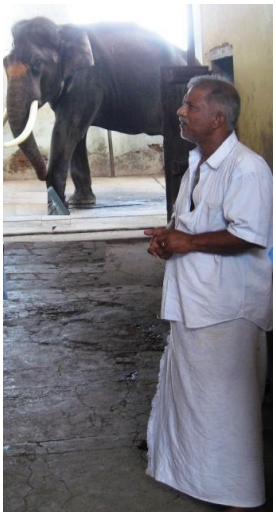


Figure 31: Elephant Mariappan's mahout

Overall M-R was 6.8 (SE= 1.6, N*= 6) showing a deviation of 15% from E-R.

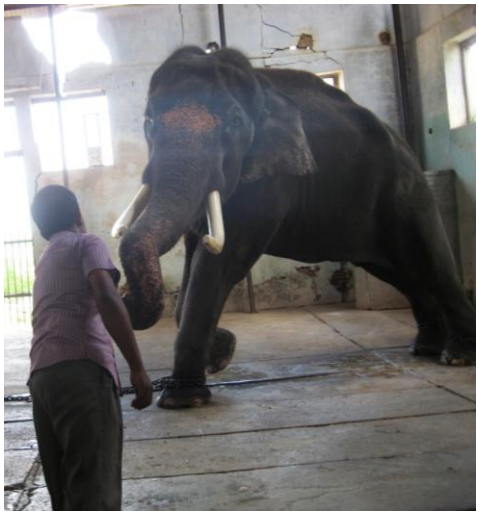


Figure 32: one of mahout's son interacting with the elephant

Overall welfare status of elephant Mariappan

The overall M-R for this elephant was 2.0 (SE= 0.5, N*= 36) implying a deviation of 75% from norms considered acceptable by experts. Figure 30 gives the distribution of deviations from E-R for each of the observed parameters. It can be seen that maximum occurrence belongs to parameters deviating by 91-100% from E-R.

In 2005, the overall M-R for this elephant was 2.6 (SE= 0.6, N*= 26) showing a deviation of 67% from E-R. Thus, the welfare status of the elephant was comparable to that observed in 2010. Additionally, with an increase in the number of parameters observed, the rating in 2010 appears to have reduced further.

Discussion:

The deviation experienced from a wild environment (physical/ biological) has been used as a basis for rating the welfare status of captive elephants. The following features characterized the life of the elephant that were completely in conflict with a positive welfare status:

- The all encompassing practice of continuous and unbroken periods of chaining the elephant effectively ensured curtailing of almost all species-typical behaviours: walking, foraging, searching for mates, comfort behaviours dust-bathing, socializing, sleeping all aspects of the elephant's life was severely restricted.
- Irrespective of the physical environment around the elephant, the fact that the elephant was chained for 24h without any opportunity to be left-free or even walk using chains, ensured complete dissonance from the behavioural and ecological needs of the elephant
- The elephant was chained within a concrete enclosure: there were no natural elements in the room: no earthen floor/ no water source/ the room had a concrete roof and hence, exposure to sunlight was only through an opening along the wall; efforts to manipulate itself or the substrate in changing weather was not possible
- Water source was from a bore-well which was not accessible to the animal when needed by it
- There was no opportunity to graze or browse: food source was only stall feed. Foraging is an important part of an elephant's life in the wild as most parts of a day are spent in walking and feeding. Absence of this feature and rigorous curtailment of movement guarantees total absence of physical and psychological stimulation

- Despite the occurrence of musth, opportunities to express species-typical activities were not possible.

The elephant was completely dependent on its human care-takers for all its needs: the only needs that were provided were food, water and a shelter each of these features was provided at complete odds with the behavioural and ecological requirements of a non-domestic species, viz., the elephant. Overt signs of health and body condition may have been used as positive indicators of absence of a problem; the damage to the psychological profile of the fettered animal and to the structure of the legs made to bear the massive weight of its body without recourse to free and unhindered movement on natural substrates would have become visible as the animal grew older.

A related aspect of this elephant's situation in terms of the stress undergone was its acquisition from a forest camp (Anamalai FC) the elephant was shifted from a near-natural forest based system to one with completely alien surroundings (both physical and biological) at an age when wild elephants are yet to disperse from their natal herds, i.e., when the animal was still dependent on its natal family. The loss of genetic stock (if this elephant was sired by a wild male) due to its unnatural way of life in the present location cannot be under-rated.

Possible reasons for continuous and permanent chaining of elephant, with no exercise, for more than five years

- Mahout's experience in this profession appears to be on par with those recommended by experts. Circumstances such as absence of insurance coverage may have been a deterrent in a job involving occurrence of injury and even death. Motivation to put one's life at risk (perceived by the mahout) will not happen if his medical expenses are to be borne by the mahout himself in the event of an injury.
- The need for employment in a field known to the mahout may have motivated the continued existence of the elephant in its present situation
- Single-handed efforts by the mahout to correct the problems faced while managing his elephant may have been unnerving; the presence of an assistant would have helped manage the elephant in a better way
- Coordinated response by the handler and the management in trying to solve the inherent issues in managing male elephants might have helped reduce the negative welfare status of the elephant

This investigation clearly shows that male elephants cannot be kept in temples, without a drastic reduction in their welfare status. It is recommended that the keeping of male elephants in temples and private owners be reviewed for their welfare status and suitable remedial action initiated in the event of poor welfare conditions.

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Compassion Unlimited Plus Action (CUPA) is a non-profit public charitable trust that was registered in 1991 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 whatever is required to alleviate their suffering at the hands of humans. CUPA does not differentiate between pet, stray or wild animals, since all 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 up to meet the need for an informed decision-making body to address 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 issues relating to conservation of natural resources and biodiversity, endangered flora and fauna, wildlife habitats and environment, including forests and wetlands. It participates in, and disseminates the acquired information, knowledge and inferences at, professional, academic and public forums.

Club for Awareness and Nature Study (CAN) is a registered Non-Government Organisation (NGO), imparting knowledge and creating awareness about nature conservation. CAN works in coordination with the Karnataka Forest Department for organising programmes on conservation education. Members of this NGO have been trained by the Wildlife Conservation Society (WCS), USA, in conducting environmental education programmes. In collaboration with ANCF, CUPA and A Roacha, the club also participates in captive and wild elephant research projects.

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.

Photo credit:

Section1: Fig. 1 (b). Section 2: Fig. 2, Fig. 12 (a & b) and Fig. 19 (a) and Front cover, Surendra Varma

Section 1: Fig. 1 (a), Fig. 2 (a & b), Fig. 4(a to d). Section 2: Fig. 1 (a & b), Fig. 5 (a & b), Fig. 19 (b), Fig. 23 (a & b) and Fig. 31, Fig 32 and Back Cover,
Ramesh Belagere

An adult tusker, Mariappan, has been maintained by the Mariamman temple in Samayapuram, Thiruchirapalli, southern India. The elephant was brought to the temple at the age of 7.5 (years) to perform duties associated with the temple. Initially, the elephant was perceived to be normal and allowed to perform its duties. During its first musth, circumstances forced Mariappan to be chained in one location. A review of the welfare status of the elephant is presented here, based on data collected by the captive elephant research team during their visit in October 2010. Direct observation of the elephant was undertaken and discussions were held with Mariappan's handler and the temple administrators. The investigation also highlights the progress made in providing better welfare conditions for the elephant with the support of the stakeholders concerned.

Compassion Unlimited Plus Action
ANCF ASIAN NATURE CONSERVATION FOUNDATION
CAN Club for Awareness and Nature Study
WSPA World Society for the Protection of Animals