

Captive Elephants at Bandipur Forest Camp



An investigation into population status, management and the significance of welfare parameters

SURENDRA VARMA

Elephants in Captivity: Occasional Report No. 4



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Preface

Keeping captive elephants in government forest camps has been a tradition of the state forest departments in many parts of India, including Karnataka. The Bandipur Elephant Camp had been a part of the Mysore Maharaja's hunting entourage, when the royal family would go hunting on elephant backs into the forests of Bandipur. However, in modern times, the management practices have not been reviewed nor the welfare of these elephants examined on scientific lines to enhance conservation measures or welfare initiatives.

Fourteen elephants were observed in the forest camp at Bandipur. Their well-being was assessed on 54 parameters and 15 each for the mahouts and cawadis. A rating value was assigned to each of the observed parameters, ranging from 0 to 10, with 0 representing adverse condition of welfare and 10 near-natural conditions replicating those that the animal experiences in the wild. The data was processed to understand the status and management of elephants and their handlers, and the significance of welfare parameters based on observing the following aspects: Population status, source of elephants, purpose of keeping, shelter type, shade type, water availability, physical exercise, free ranging or chained status, opportunity for social interaction, observed behaviour, occurrence of stereotypy, nature of work, provision of food, reproductive status, healthcare, veterinary care, availability of veterinary doctor and experience, maintenance of records and welfare status of mahout/cawadi.

The report is developed for forest officials, research institutions or individual elephant researchers, policymakers, elephant enthusiasts and NGOs who work on welfare aspects of the species. We hope the findings help in understanding the current status of captive elephants and their mahouts. It is important to appreciate that mahouts form an integral part of elephant management. It is hoped that this report will motivate concerned individuals and the authorities to implement the suggestions and improve the living conditions of both the elephants and their handlers.

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Special thanks are also due to Mr. Rajendra Hasbhavi, Ms. Shama Karkal, Ms. Vydehi Kadur, Mr. Daniel Sukumar and Mr. Karthik, who provided critical data and information on the Bandipur camp elephants. Ms. S. R. Sujata provided support in data processing; Mrs. Suparna Baksi-Ganguly, Dr. Shiela Rao and Ms Deepika Prasad of Compassion Unlimited Plus Action (CUPA) provided critical inputs .

Executive Summary

The Maharaja of Mysore established the Bandipur Elephant Camp (BEC) to employ the elephants for hunting and to entertain his guests.

The camp comprises entirely of adult female elephants. Except for one adult male and male calves that were born here, male elephants do not form a part of this particular camp system.

The well-being of each animal was assessed by observing the physical environment, morphology of the animal, behavioural characteristics and physiological features along with several parameters relating to economic and social situations and the attitude of the mahouts towards the animals.

The elephants were assessed on 54 parameters and the mahouts on 15. A rating value was assigned to each observed parameter, ranging from 0 to 10, with 0 representing adverse welfare condition and 10 near-ideal conditions, replicating those that the animals experiences in the wild.

Rating values were graded in the following manner:

- 0.0–2.4: Bad
- 2.5–4.9: Poor
- 5.0–7.4: Moderate
- 7.5–10.0: Satisfactory

The camp has three adults ranging from 35 to 60 years, three sub-adults ranging 12–13 years, three calves of 1–1.6 years and 4 juveniles of 4–6 years. Three of the calves were rescued from the wild, when separated from their natal herd. One adult female was rescued from a circus (Rani, 60 years). The single adult male in the group (Jayaprakash, 45 years) was captured from the wild about three decades ago.

The mean value for source of animals for this camp was 7 with 64% of the elephants being born in the camp. This implies moderate breeding opportunities.

The current number and group structure kept in the camp are very similar to the patterns seen in the wild for elephant herds—28.5% of adult females (two breeding sub-adults + one breeding adult), 7% of adult male, 0% of sub-adult females (since reflected in the adult ratio), 21% of juvenile males, 14% of juvenile females and 21% of calves.

For all the observed forest camp elephants, the forest itself is the natural shelter. Elephants are reported to be in the forest at all times except for 4 h, when they are used for tourist rides.

Currently, Tavarekatte kere, Pick-up kere, Bandipur kere, Sulli katte kere water bodies, located at a mean distance of 200 m from the camp, are used for both drinking and bathing purposes.

The elephants drink on an average 2.2 times per day, averaging about 18–20 trunk fills (approximately 100 l/day). The mean duration for bathing is 2 h; the elephants are scrubbed with stones.

Overall mean value for water (drinking and bathing) is 6.33 with values for individual parameters ranging from 2.0 to 10.0.

All the 14 elephants of this camp are allowed to interact socially among themselves for all the 24 h in a day. Overall mean for interaction is 10.0.

Sixty-four percent (N = 14) of the animals at the camp are docile while 21% are disobedient, 14% show signs of being unruly as they have thrown people off their backs, while on joy rides. Jayaprakash (male, 45 years) shows signs of stereotypic behaviour in the form of resting his trunk on the tusks.

Overall mean value for behaviour is 8.81 implying occurrence of normal behaviour.

Four elephants are used for work purpose; this involves carrying tourists on a 'howda' for trips within the forest. Working hours are between 9 and 11 am, and 4 and 6 pm, a total of 4 h daily, for a distance of approximately 1 km per trip with a weight of 400 kg.

All the elephants are provided with stall-feed and are also allowed to range free for food. The stall rations include cooked horse gram, ragi, raw jaggery, coconut and salt. Rice is also added along with other items for the juvenile males and calves.

Three females show occurrence of estrus cycles and Rani (60 years) is not cycling. The elephants are exposed to both captive and wild males and their age at first offspring's birth ranged from 12 to 22 years with one calf being born at each calving.

The adult male elephant Jayaprakash is said to have mated with all the females and has been also observed to mate with wild female elephants. The presence of an active male and the free-ranging nature of the camp (wild males freely mating with camp females) have contributed to the birth of many calves.

Rani has toe nail cracks which persist across all seasons and are attributed to neglect by the previous management. Overall mean for health status is 4.7 indicating poor conditions.

A veterinary doctor with 10 years of experience in treating elephants is available but is based at the Nagarhole Elephant Camp and visits this camp once a month. The current doctor-to-elephant ratio is 1: 54.

Overall mean value for veterinary care is 7.3 indicating good veterinary care conditions. However, some specific parameters such as frequency of veterinary doctor's visit and availability of veterinary facilities score poorly, as shown by their ratings.

The overall mean value for this camp, when considered across individual scores for each animal, is 7.9 indicating good well-being of the elephants, in general.

Mean experience as a mahout is 6.42 years ranging from 0.67 to 20 years. The mean experience

with the elephant that the mahout is currently handling is 4.8 years, ranging from 1 to 10 years. The mean annual salary for a mahout/cawadi is Rs. 38,457 which ranges from Rs.15, 000 to 62,000 (1 US \$ = Rs. 43.75) per year. Only 43% percent of the mahouts have permanent jobs.

Welfare status and work experience of mahout was assessed across 15 parameters each and the overall mean value for mahout/cawadi is 6.9.

However, some basic facilities are inadequate. These include:

The kitchen-cum-storeroom is very small

There are no animal stands (partitions) that separate the elephants from the kitchen-cum- storeroom

There is no water tank

Elephant equipment and accessories including “howda” are kept in vehicle parking area, and are exposed to rain and weather

Mahout quarters, on an average, are about 3 km from the camp

Due to lack of manpower resources, the mahouts are also engaged in forest-fire control operations as well as in conducting tourist rides

Also due to lack of manpower, mahouts are changed often and have no/little control over development of a trusting relationship with the elephant

Benefits available for permanent staff are not available to non-permanent staff.

The current campsite is dominated by lantana plants with low grass cover

Calves have no food source around the camp; during summer the situation gets worse

During summer, the food fed to the elephants should be changed to paddy-grass and grains

Ragi (millet) is not processed in time due to many constraints at the camp; consequently elephants do not get their rations on time everyday.

Recommendations

It is recommended that the current number of elephants (14) be distributed in 2–3 small units. This could be achieved in the following manner:

- A i) Rescued animals
- A ii) Seized animals with both rescued and seized animals together acting as a small family unit
- B i) Elephants born in the camp along with their mothers
- B ii) Tourism/working elephants
- B iii) Creating a combination of the above in a way which would not separate their social unit

The separation into different units should not disturb the family unit of the animal.

- Changing the current campsite to smaller units in Rampura and such other places is recommended. The current BEC, even with a smaller number, does not have running water source close to the camp. Campsites should not be established close to the main roads, making both Bandipur and Moolahole unsuitable locations. Sites with less disturbance and are closer to a good source of running water need to be selected.
- Staff should be appointed at Forester level with independent charge exclusively for camp management. He should be able to devote to this work only and not be employed for any other work. This point person is to be in charge of the Bandipur elephants exclusively at the proposed 3/2 camps The recommended staff structure is:

Forester
One Head Mahout or Camp Officer (C.O.)
One Veterinary Doctor

- Provide staff quarters closer to the camps.
- Shift food habits to raw food, ragi/paddy straw with grains as supplement, as mentioned earlier. Ragi and other food items are not processed in time and elephants do not get their rations on time; the problem be sorted out soon.
- Two keepers have to be appointed for the management of each adult elephant.
- An increase in the doctor–elephant ratio is strongly recommended in lieu of which a qualified veterinary assistant be appointed.
- Tourist rides should be avoided or kept to a minimum. Due to overload of visitors, elephants often do not get enough time for bathing or foraging. The elephants with calves do not get adequate resting time to suckle them. Given that the welfare of the elephants is the uppermost concern, the interest of tourists is secondary to the welfare of the animals.

- Not more than two adult human beings should be allowed on the back of elephants. Along with the mahout, this constitutes about 150–200 kg weight on the spine, which is a delicate part of the elephant anatomy. Elephant gear like howdahs, etc. should be kept under proper care and supervision. Rusted or worn-out parts damage the skin of the animal by scratching, chafing and also will lead to serious injuries.
- Elephant Rani needs special care; being a rescued animal (from a circus) and old it is not habituated to eating forest food. Food intake for this animal has to be increased. Nutrient mixes, fruits, soft feed and green grass should be given to her under the supervision of a specially appointed mahout.
- Given that much of the private establishments around the Bandipur National Park have benefited greatly from the forests and the environment, they should be drawn into and engaged in certain aspects of management of the elephants in different locations. They should be encouraged to contribute to the upkeep, care and monitoring of the facilities. A model is available for an Elephant Nature Park and Rescue Center based on the famous Thailand model of Ms. Lek Chailbert at the Bannerghatta National Park, Bangalore, which is a government–public–private enterprise. It is recommended that the same be studied and implemented and a management committee of both officials and non-officials be formed for proper management of the elephants at the BEC.
- Old elephants, juveniles and calves need specific management. Their day-to-day care should be overseen closely. Members of the above-mentioned governing body should visit the sites regularly and give written reports to the DCF on the functioning, improvements made, and problems, if any.

Introduction

The Maharajah of Mysore established the Bandipur Elephant Camp (BEC). At that time, elephants were used for hunting and entertaining the guests of the Maharajah. Each elephant was under the custody of a mahout. Grass-paddy was the staple diet and rations were under the mahout's control. The camp was established with all adult female elephants. One male elephant, Jayaprakash, joined this camp when he was about 6 years old. Except for male calves born, some of which died or were sold, male elephants did not form a part of this particular camp system. Elephants in forest camps have rarely been studied in a scientific manner. This investigation is a part of all India Captive Elephant Survey conducted to understand the current status of elephants and their handlers at the Bandipur Elephant camp.

Survey methods and data processing

Investigators observed 14 elephants (eight males, six females) using a standard datasheet covering factors such as space, facilities, manpower and funds. The main objective of the investigation was to evaluate the animal's living conditions, physiological, behavioural and health profile. Each of these parameters was rated on a scale of 0–10, ten representing satisfactory conditions and 0 bad conditions. The well-being was assessed on 54 parameters for the elephants, and 15 for the mahouts (see Appendix 1 for parameters used and their rating scale). The suitability of a parameter depended on the replication of near-natural conditions for the animal. Any feature which provided conditions similar to those experienced by the animal in the wild state was given a rating of 10. The more the deviation from this state, the lesser the rating accorded to it. Scores between 0.0 and 2.4 constitute bad living conditions and those between 2.5 and 4.9 imply poor conditions. Ratings in the range 5.0–7.4 indicate moderate living conditions while those between 7.5 and 10.0 represent satisfactory status.

For example, hard surfaces for resting, 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 reflect the ill-effects of such substrates on the health of the animal, specifically the feet of an animal as large as the elephant. Each parameter representing different facets of captivity was measured using several sub-parameters. For instance, the shelter or enclosure provided to the animal was measured in terms of its type (whether there was provision of natural forest conditions or was it a man-made structure), size, floor type, maintenance of hygiene and availability of shade within. The rating for each parameter was averaged across its sub-parameters to give a mean value for that feature. Welfare status of the mahout/cawadi was rated by studying his socio-economic profile. The rating scale is the same as for the elephants. High rating values imply suitable social and economic conditions prevailing for the mahout/cawadi. Some parameters were rated based on "Yes–No" type of information. In such cases, rating was either 10 or 0 without any scores in between. A score of 10 implies occurrence of a parameter suitable to the animal and 0 its absence.

For some parameters mean value (with standard deviation and error) was calculated (e.g., mean of age class of elephant kept in each regime, or mean distance from camp to water, etc.). For some parameters, proportions of individuals or occurrence were calculated (for example, proportion of male and female (of all age class) kept in each regime or proportion of an individual elephant is exposed to water from a river or other sources). Mean with standard deviation, standard error (SE) and percentage coefficient variation (%CV) was calculated for each category.

Results

Population status

Currently, the camp has 14 elephants (Table 1); 64% are captive born, 28.5% are orphaned and 7% are confiscated (from circus). Mean age of the observed elephants was 14.6 years with ages ranging 1.260 years (Figure 1). The overall sex ratio of the animals kept currently is biased towards males. However, the adult sex ratio is clearly biased towards females. Juveniles and calves are biased towards males. Breeding females outnumber breeding males, since sub-adult females are also breeding in this camp.

Table 1: Name, age and source of the elephant at Bandipur Elephant Camp

Sl No.	Name of the Elephant	Age (Years as on March 2008)	Source
1	Jayaprakash	45	Captured
2	Diana	13	Captive born
3	Theresa	12	Captive born
4	Chaitra	36	Captive born
5	Rani	60	Rescued from circus
6	Rajendra	6	Captive born
7	Roopa (now Seetha)	6	Captive born
8	Muruthanjai	4	Orphan calf (rescued from wild)
9	Padmaja	6	Orphan calf (rescued from wild)
10	Pritiviraj	8	Orphan calf (rescued from wild)
11	Hamsaraja	4	Captive born
12	Krishna	1.6	Captive born
13	Manikantan	1.3	Captive born
14	Bhatra (Diana's Calf)	1.2	Captive born

The current number kept at the camp is similar to the patterns seen in the wild of elephant herds, that is 28.5% of adult females (2 breeding sub-adults + 1 breeding adult), 7% of adult male, 0% of sub-adult females (since reflected in the adult ratio), 21% of juvenile males, 14% of juvenile females, and 21% of calves.

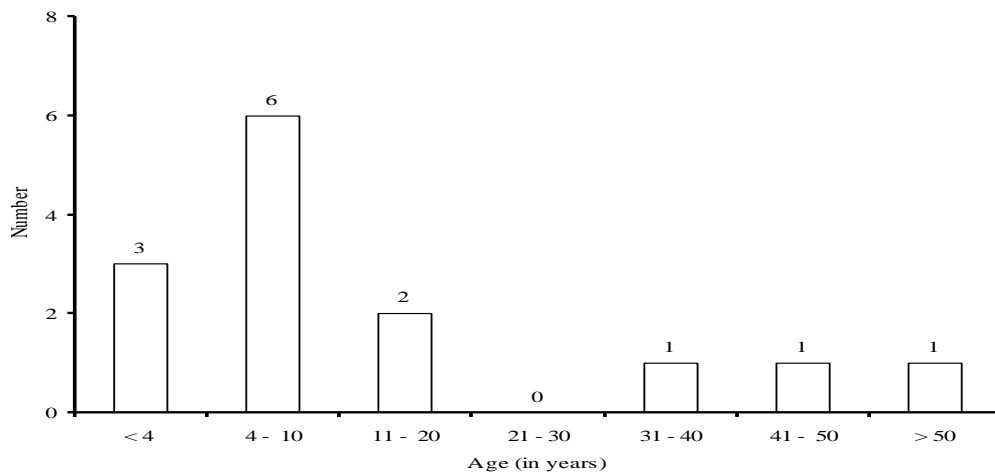


Figure 1: Age distribution of elephants.

Source of elephants

Of the 14 elephants, 9 were born in captivity in the same camp (Figure 2). Three calves were rescued from the wild as they had lost their natal herd. One adult female was rescued from a circus (Rani, 60 years). The single adult male in the group, Jayaprakash (45 years) was captured from the wild three decades ago. This parameter provides a measure of the origin of the elephant: whether it was born in captivity or was caught from the wild or obtained from other sources. The mean rating for this camp was 7.91 (SE = 0.48, N =14) with 64% of the elephants being born in the camp.



Figure 2: Captive-born constitutes the major source of elephants for the camp.

Shelter and associated parameters

- All the observed elephants belonged to forest camps and hence the forest itself was the shelter.
- The size of the shelter was thus vast and open.
- The camp has earthen flooring.
- Natural forest shade is available for all the elephants.

Shelter was rated using five sub-parameters to include different aspects of the enclosure (Figure 3). The overall mean for shelter was 10.0 (SE = 0.0, N = 5) implying natural, forest conditions in terms of housing, floor type and availability of shade for all the animals. There is no variation in any of the recorded parameters.

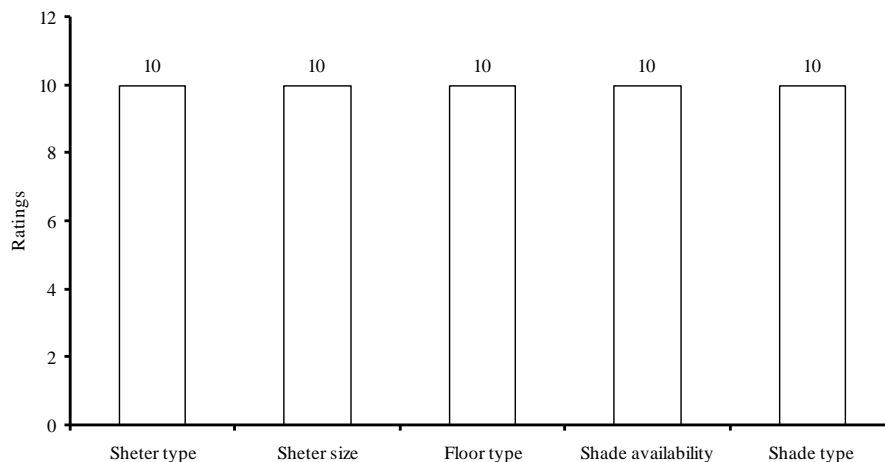


Figure 3: Mean rating for shelter.

Water and associated parameters

- Currently, Tavarekatte kere, Pick-up kere, Bandipur kere, Sulli katte kere water bodies are used for both drinking and bathing.

- Source of water for drinking and bathing are tanks at a mean distance of 200 m from the camp.
- In the morning, the elephants are taken to Bandipur kere and Pick-up kere which are 0.5 km away from the camp. During summer, bore well water is used and water is provided in buckets.
- The elephants drink 2.2 times per day on an average (SE = 0.06, N = 14) at a rate of 18–20 trunkfuls. This worked out to 100 l per day.
- The mean number of times the elephants were bathed in a day is 2.0 (SE = 0.0, N = 14) with varying size of the bathing place depending upon the availability of tanks.
- Mean duration of bath is 2 h (S.E = 0.0, N = 14).
- All the elephants are scrubbed with stones.

The availability of bathing and drinking water was rated over nine sub-parameters which included quantity and quality of water provided the place of provisioning of water, bath duration, etc. Higher rating values show the occurrence of running water under free-ranging conditions in forests.

Overall mean rating for water (drinking and bathing) was 6.33 (SE = 0.21, N = 9) with values for individual parameters ranging from 2.0 to 10.0. Of the nine sub-parameters, four were given a rating below 6

(Figure 4) implying poor conditions for water-related parameters. The sub-parameters which were given a rating less than 6 were:

- Drinking and bathing water source: score of 4 (SE = 0, N = 14)
- Number of times drinking water: score of 5 (SE = 0, N = 14)
- Place of bath: score of 4 (SE = 0, N = 14)
- Materials used for bath: score of 2 (SE = 0, N = 14)

A significant and essential feature of water for the Bandipur elephants was the source of water for drinking and bathing. Tank water provided a source for both purposes, which was given a rating of only 4 implying a poor source. This is important because all other water-related features are dependent on this source. Thus, even though the elephants were said to range free, their water intake was less than recommended and the number of times they were to drink water was also low.



Figure 4a: Water tank at cooking shed, one of the sources of water.

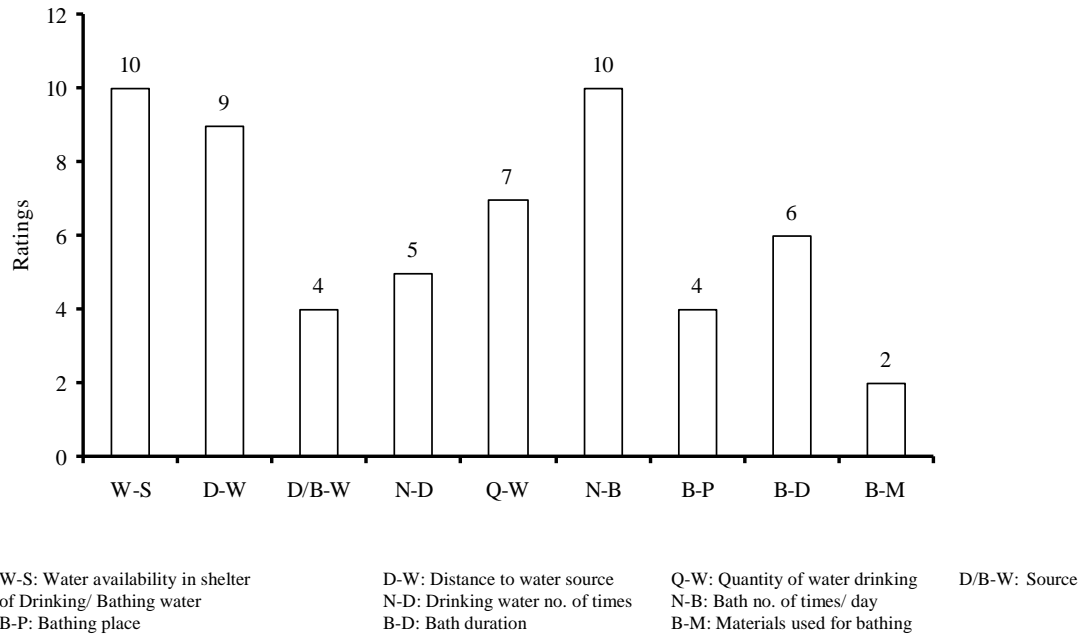


Figure 4b: Mean rating for water.

Rest and resting place

All the observed elephants were allowed to rest and sleep in forest or natural conditions with access to shade. They were reported to be in the forest at all times except for four hours when being used for tourist rides.

Mean sleep duration was 4 h (SE = 0, N = 14) and time of sleep was at night.

Higher rating values were given for parameters that replicated natural conditions for the animal. If the sleeping place had hard substrate, it was given a lower rating value as compared to one with natural conditions. Overall mean rating for sleep parameters, consisting of three sub-parameters (Figure 5) was 10.0 (SE = 0.0, N = 3) indicating provision and occurrence of near-natural conditions for sleep-related parameters for all the elephants.

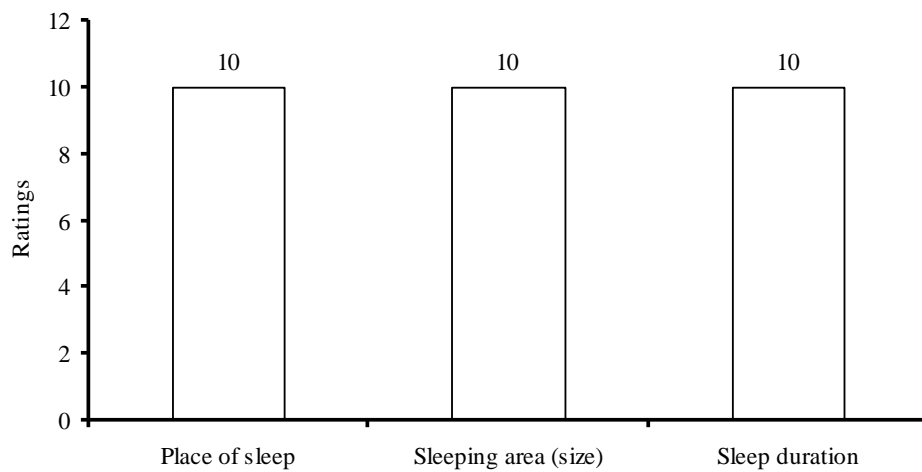


Figure 5: Mean ratings for sleep.

Physical exercise

All the elephants are allowed to walk over an area of 2 km². The mean distance walked is 5 km (SE = 0, N = 14). Time of day for walking is between 9 and 11 am, and 4 and 6 pm. Mean rating for the elephants to walk is 10.0 (SE = 0.0, N = 14) showing opportunity to walk. All the animals are given a rating of 10.0 for physical exercise (Figure 6).

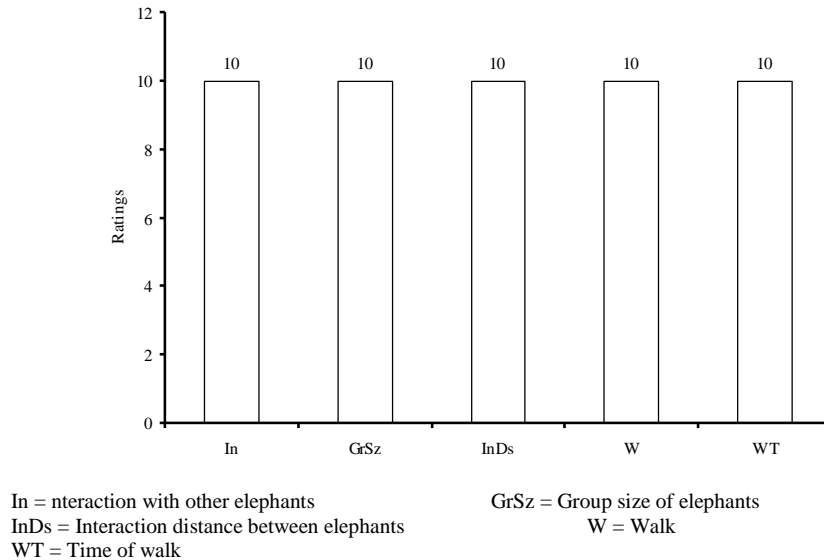


Figure 6: Mean rating for social interaction and physical exercise.

Interaction with other elephants

All the elephants are allowed to interact socially among themselves. The area of interaction is vast as it is in the forest. Interaction is allowed all through the day among all the individuals (Figure 6).

The isolation of captive elephants and lack of opportunity for interaction with others makes it a feature of importance (Poole *et al.*, 1997) for assigning rating values. Higher values indicate interaction conditions, in terms of number, age and sex of the animal, distance between elephants and hours of interaction, replicate near-natural conditions. This parameter is evaluated using three sub-parameters (Figure 6). Overall mean for interaction is 10.0 (SE = 0.0, N = 3) with all the animals being allowed interaction among themselves.

Group size (Figure 7) of the animals was:



Figure 7: Current group size (number and age classes) is ideal for social interaction.

- 5 adults: four females—Diana (13 years), Theresa (12 years), Chaitra (36 years) and Rani (60 years); one male—Jayaprakash (45 years)
- 3 calves: all males—Krishna (1.6 years), Manikantan (1.3 years) and Bhatra (1.2 years)
- 6 juveniles: 4 males—Priitviraj (8 years), Rajendra (6 years), Hamsaraja and Mruthunjai (4 years)—Two females; Padmaja and Roop/Seetha (6 years)

The elephants are together and move together inside the forest.

Mean rating for occurrence of interaction was 10.0 (SE = 0.0, N = 14) indicating provision and opportunity for social interaction among all the animals. Mean rating for group size of elephants is 10.0 (SE = 0.0, N = 14) showing near-natural conditions of group size. Kurt and Garai (2007) report high incidence of species-specific social behaviour in extensive systems. Rating of 10.0 for physical distance among the animals (SE = 0.0, N = 14) shows that the animals were not too far apart to prevent feeling and touching another animal which is essential for their well-being.

Training

All the animals were trained. The rescued elephant, Rani, was also trained in circus-related activities. A total of 16 commands are used, of which six are for work and the rest are for other activities.

Observed behaviour

Sixty-four percent (N = 14) of the animals are docile while 21% are disobedient. Only 14% showed signs of being unruly as they had thrown people off their backs. None of the elephants had shown any aggression towards people, either by injuring or killing. Only one elephant, Jayaprakash (male, 45 years), shows signs of stereotypic behaviour in the form of resting his trunk on the tusk.

Captive conditions, however comfortable they may be, impose restrictions on the animals; at times. These might be alien to the animal's natural way of life and result in abnormal behaviour; stereotypy is one such which is used to assess the quality of a captive animal's life. This parameter was assessed using three sub-parameters. Overall mean rating for behaviour is 8.81 (SE = 0.61, N = 3) implying normal behaviour. However, Jayaprakash expresses medium intensity of stereotypic behaviour. The other probable reasons for such abnormal behaviour are early separation from natal herd or restricted performance of 'appetitive' behaviours (Kurt and Garai, 2007).

- Mean rating for observed behaviour is 7.1 (SE = 0.16, N = 14) with 64% of the animals described as docile. Juvenile male elephants were disobedient.
- None of the animals were aggressive; mean rating is 10.0 (SE = 0, N = 14).
- Only one elephant, Jayaprakash, exhibited stereotypic behaviour; mean rating is 9.3 (SE = 0.13, N = 14).

Chaining and chain-related parameters

Except for the calves and the juvenile Hansaraja (4 years, male), all the animals were left for free ranging with a drag chain. The chains were 50 feet long, weighed 50 kg, and measure 0.85 cm in thickness.

An attributed characteristic of captive elephants is the use of chains for a variety of reasons leading to restricted movement of the animal. Chain-related variables were assessed over three sub-parameters (Figure 8), with high scores indicating near-ideal conditions of free-ranging opportunity for the animal. Overall mean for chaining is 5.81 (SE = 1.1, N = 3)

- All the elephants are allowed to free range at night. This is given a rating of 10.0 (SE = 0, N= 14).
- The elephants, except the four calves, are chained in the leg with a drag chain. This is given a rating of 1.0 (SE = 0.0, N = 10).
- The parameter free ranging with drag chain is given a rating of 6.43 (SE = 0.12, N =14) with 71% of animals carrying a drag chain while free-ranging (Figure 8).

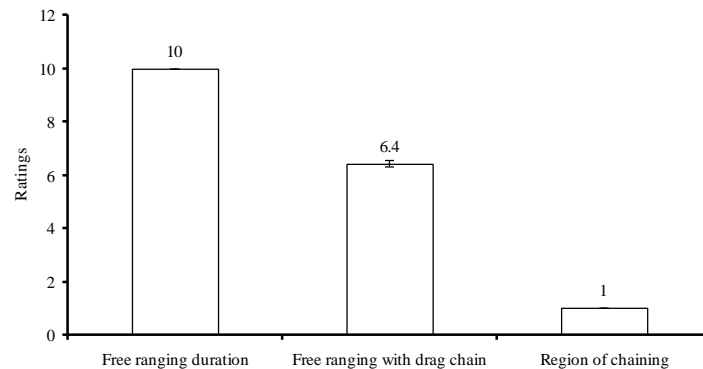


Figure 8: Ratings for chaining.

Nature of work

Only four elephants are used for work purpose. They are: Jayaprakash (male, 45 years), Diana (female, 13 years), Theresa (female, 12 years) and Chaitra (female, 36 years). Work involves carrying tourists on howdah (Figure 9) for trips within the forest. Working hours are between 9 and 11 am, and 4 and 6 pm, for a total of 4 h. The distance covered is 1 km per trip with a weight of 400 kg. All the four animals have begun working since they were 15 years of age. They are not given any rest, food or water during the work period.

Captive elephants are made to work, usually of a kind that is alien to their natural behaviour. Rating is given for nature of work that replicates the animal's natural behaviour in the wild. Work type such as patrolling in forests is given higher rating than that which subjects the animal to perform such tasks as standing for hours in one place or raising itself on its hind legs, etc. Mean rating is 8.6 (SE = 0.12, N = 14) with 71% of the animals getting a rating of 10.0 for not being given any work. The animals that are given work are given a rating of 5.0 implying poor work type.



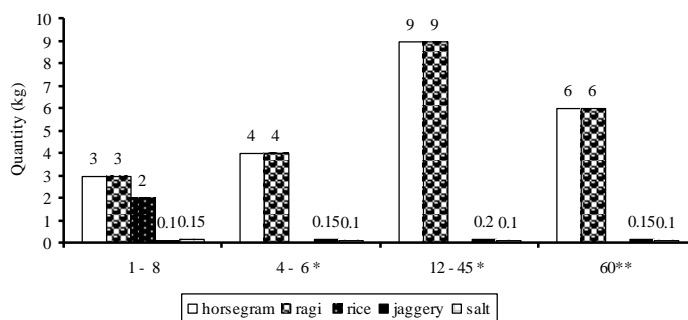
Figure 9: Work type involves carrying tourists on howda.

Provision of food

- All the elephants are stall-fed and are also allowed to range free for food.
- Time of feeding is 8–9 am and 3–4 pm.
- Stall-feed includes: Horse gram, ragi, jaggery, coconut and salt (Figure 10). Rice is added to other items for juvenile males and calves.

- Straw/hay is not provided.
- Free ranging for feeding is allowed across all seasons.
- Commonly eaten food is grass, tree leaves, bark, etc.

None of the elephants has raided crop fields while free ranging.



male and female elephants, ** For the elephant Rani

• Includes both

Figure10: Food provisioning.

This parameter was measured using three sub-parameters which included food provisioning type (stall-fed or allowed to range free in natural conditions), the number of food items during stall feeding and usage of a ration chart.

Overall mean rating is 10.0 (SE = 0.0, N = 3) implying ideal food provisioning. Higher rating is given for elephants which are stall-fed and allowed to range free. This also gives a scope for foraging and socializing (Kane *et al.*, 2005; Sivaganeshan & Johnsingh, 1995).

Food type (number of food items)

Food which includes supplementation of natural feeding by the animal with stall-feeding is given higher rating. Mean rating is 10.0 (SE = 0.0, N = 14). The camp maintains a ration chart for the animals.

Reproductive status

Female

Three females, Diana (13 years), Theresa (12 years) and Chaitra (36 years) showed oestrus cycles (Figure 11, a, b and c). Rani (60 years) was not cycling. Remaining female animals are yet to show oestrus signs, being only 6 years of age.

The elephants are exposed to both captive and wild males. Age at first birth ranged from 12 to 22 years with one calf being born at each calving. Chaitra had given birth to four calves, of which one female died when it was 3 years old.



Figure.11: Reproductive females of the camp. a) Chaitra.



Figure.11: Reproductive females of the camp.
b) Theresa.

in the forest camps of Karnataka

Captive female elephants with access to both wild and captive males are given a higher rating. All the breeding females have mated with captive and wild males. The presence of other female elephants while the pregnant mother delivers has been scored, as it forms an important feature of their natural behaviour.

All the elephants are given a rating of 10.0 for this feature. The observation of mating by the elephants, with wild or captive animals, is also rated as this provides input on the male source. All the breeding females mate and thus are given a rating of 10.0.

Reproductive status of the female elephant is assessed by examining variables such as whether the elephant is cycling or not, opportunity to mate, etc. Of the adult female elephants in the camp, only Rani (60 years) was not exhibiting estrus cycles and a consequent rating value of 0.0 is allotted to her. The other elephants (age range 12–36 years) are cycling and are given a rating of 10.0.

Two juvenile females (both 6.0 years) are yet to come into estrus and hence are not rated. Sukumar (2003) had reported active reproductive status in many female elephants



Figure 11: Reproductive females of the camp.
c) Diana.



Figure 12: Reproductively active male of the camp.

Male

The adult male elephant Jayaprakash (Figure 12) is reproductively active and exhibits signs of musth. Period of musth is four months during which the animal is allowed to roam in the forest. Male elephants are assessed for reproductive status by rating several sub-parameters such as: reproductively active/not, occurrence of musth, exposure to females, etc.

In this camp, only one male elephant, Jayaprakash (45 years), is in the adult age group. All the other males are calves/juveniles (age range 1.2–6.0 years) and are not considered for rating for this feature.

Elephant Jayaprakash is reproductively active and is given a rating of 10.0. The elephant also exhibits signs of musth. The rating for this feature is 10.0. The elephant has mated with captive females. This is given a rating of 10.0. Behavioural changes in an elephant during musth make management of the animal a challenging task.

Higher values indicate provision of natural conditions for the animal while low scores denote isolation, chaining or other un-natural conditions. The elephant, when in musth, is allowed to roam free in the forest. This is given a rating of 10.0 reflecting ideal reproductive status and a measure of well-being (Moberg, 1985)

Disease/injury occurrence and veterinary schedule practiced

- Sixty-four percent of the animals suffer from diarrhoea three times a year. This is attributed to eating fresh grass or eating mud. Rani has toe nail cracks which persist across all seasons and is attributed to lack of care by the previous management.
- All the animals have been de-wormed.
- None of the elephants is vaccinated.
- Tests of blood/urine/dung have not been conducted.
- Weight of any of the animals has not been measured.

Veterinary care facility

Veterinary doctor with 10 years of experience in treating elephants is available for all the animals (N = 14). The doctor works at the Nagarahole Elephant Camp and visits this camp once a month. The current doctor-to-elephant ratio is 1:54. No veterinary clinical facility is available within the camp. The health of a captive animal assumes greater importance when its correlation with captive conditions is considered (Cheeran, 1997).

Poor captive conditions, both physical and/or social, result in ill-health among animals. The health status of the elephants is assessed by rating eight sub-parameters (Figure 13) such as disease/injury occurrence, nature, adherence to prescribed veterinary schedule, etc. Overall mean for health status is 4.7 (SE = 0.82, N = 8) indicating poor conditions. Mean rating for this sub-parameter is 2.1 (SE = 0.57, N = 14) with 79% of the animals experiencing disease/injury (Figure 10).

Disease/injury type is rated based on whether it could lead to further health problems, if it is amenable to treatment and if it caused distress to the animal. When an animal has a disease or injury of chronic nature that cannot be treated, causes pain to it and leads to other health problems, it is given a rating of 0. Maximum value of 8 is given to an animal with a disease or injury without any of the above-mentioned features.

Mean rating is 5.5 (SE = 0.42, N = 10) with 90% of the animals getting a rating of 6.0 implying occurrence of disease/injury that does not lead to further health problems but is not easily curable. Only one, Rani (60 years, female), is given a score of 1.0 indicating harmful/painful disease/injury that might lead to further health problems, which fortunately is curable. All the animals are de-wormed. Thus, the rating is 10.0 (SE = 0, N = 14).

However, none is vaccinated. A rating of 0.0 is given to this parameter. Oiling is done for all the elephants; hence a score of 10.0 (SE = 0.0, N = 14) is given. The frequency of oiling is also given a rating of 10.0 (SE = 0.0, N = 14). None of the tests is done for any of the elephants; hence, a score of 0.0 (SE = 0.0, N = 14) is given. The weight of the animals was not measured, hence, a rating of 0.0 (SE = 0.0, N = 14).

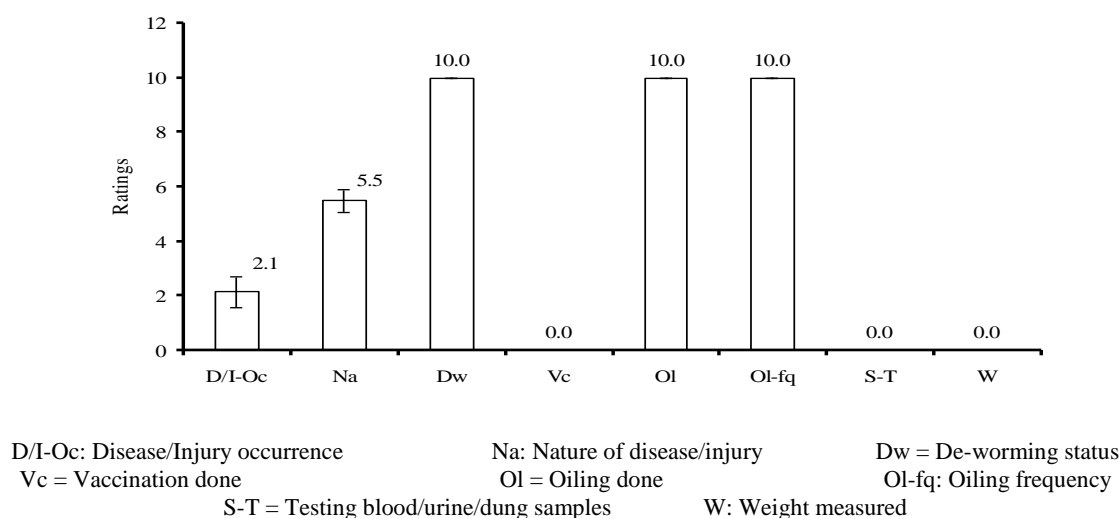


Figure 13: Health status.

Veterinary care and facilities

Availability of veterinary care and facilities are of utmost importance for the welfare of a captive animal. This parameter is assessed based on seven sub-parameters such as: availability of veterinary doctor, his/her experience with elephants, years of experience, availability of veterinary assistant, etc. Overall mean rating is 7.3 (SE = 0.80, N = 7) indicating good veterinary care (Figure 14). However, some specific parameters such as the frequency of veterinary doctor's visit and availability of veterinary facilities are poor as shown by their rating.

Mean rating is 10 (SE = 0, N = 14) indicating veterinary doctor's availability for all observed elephants. The veterinary doctor visits and checks the elephants once a month or in the case of an emergency. However, the doctor is located at Nagarahole at a distance of 150 km. A rating of 5.0 is assigned. The camp does not have clinic or emergency care facility; and hence a rating of 0.0 is given.

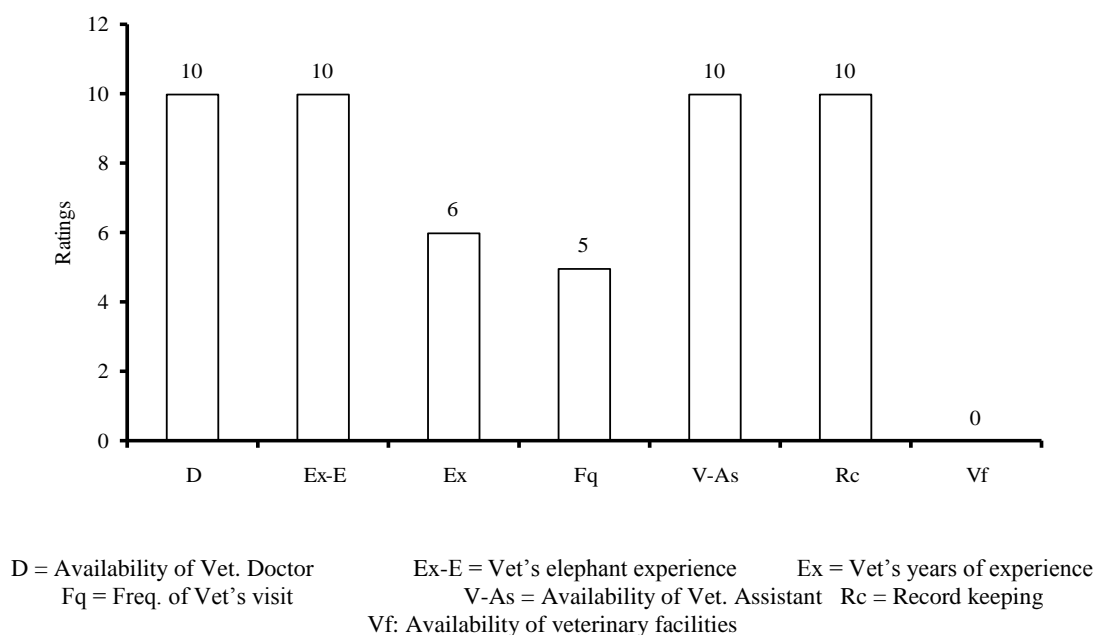


Figure 14: Veterinary care.

Number of mahouts changed for each animal

Mean number of mahouts changed per animal is 0.76 (SE = 0.09, N = 13) ranging from 0 to 3. Sixty-two percent of the animals have had no change in mahout while Jayaprakash had three.

Infrastructure and fund

The following are available at the camp:

- staff quarters
- cooking shed (Figure 15)
- cooking vessels
- provision shed (Figure 15)



Figure 15: Shed for cooking and storing of provisions.

However, all of the above are in bad condition and both animal stands and Kraals are not available.

Annual funds required for maintaining an animal are of the order of Rs. 3–4, 00,000 (1 US\$ = Rs 43.75). Annual veterinary cost is Rs. 5000. Salary range for the mahout/cawadi is Rs. 50–96,000.

Overall rating pattern

Percentage rating for Bandipur camp is biased towards 10 (56%) followed by 6, 0 and 9. Some percentage of negative rating (0 to 5) reflects in the management of elephants (Figure 16). The rating did not differ among individual elephants, i.e., there is no variation in the rating for the parameters provided by the management. Parameters such as reproductive status, observed behaviour of the animal and occurrence of disease/injury showed variation in rating.

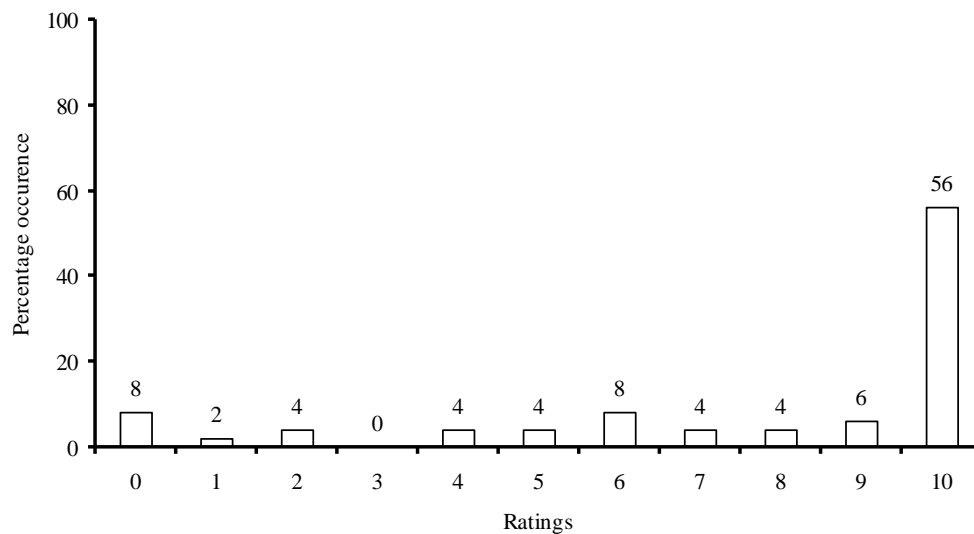


Figure 16: Percentage occurrence of mean ratings for Bandipur elephants.

Mahout/Cawadi

Socio-economic and welfare status

Average age of the mahout is 30.3 years (SE = 0.52, N = 7) ranging from 19 to 45 years. Mean experience as a mahout is 6.42 years (SE = 1.0, N = 4) ranging from 0.67 to 20 years. Mean experience with the elephant the mahout currently handling is 4.8 years (S.E = 0.5, N = 5) ranging

from 1 to 10 years. Forty-three percent (N = 7) expressed interest in being a mahout and hence preferred to join the profession and the remaining joined as it was a family occupation. All the mahouts/cawadis belonged to tribal community among all the handlers interviewed. All the mahouts (N = 13) have received training, while 71% learnt by experience. Most mahouts have attended school (Figure 17).

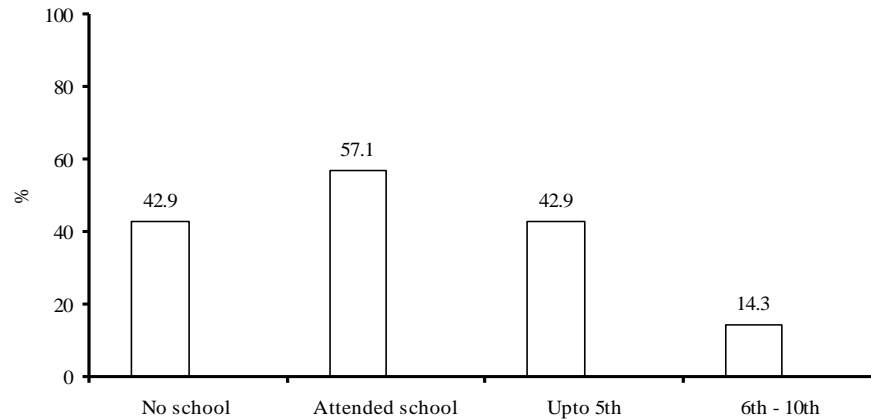


Figure 17: Education status of mahout/cawadi.

Mean annual salary for mahout/cawadi is Rs. 38,457 (SE = 22.8, N = 7) ranging from Rs.15, 000 to 62,000 (1 US\$ = 43.75) per year. Forty-three percent of the mahouts have permanent jobs (N = 7) (Figure 18a & b). Seventy-one percent of the mahouts/cawadis are married (N = 7) with a mean number of 3.2 children (SE = 0.1, N = 5). Fifty-seven percent of mahouts are provided with accommodation (N = 7). However, the condition of the quarters is bad. All the mahouts use tool (stick) to control their



Figure 18: Elephant handlers. a) Permanent mahout with government uniform.



Figure 18: Elephant handlers. b) Provisional mahout without government uniform.

elephant. Fifty-seven percent of the mahouts and cawadis had periodic health check-ups. The check-ups for the mahouts are conducted once in six months.

Welfare of the elephant is indirectly affected by the welfare of its handlers, the mahout/cawadi. Hence, their economic and social aspects are recorded and rated. Also, elephant-handler aspects such as experience as a mahout, whether trained or not, etc. are rated. The ratings are on a scale of 0–10, with 0 representing adverse conditions and 10 the

best possible status for the mahout/cawadi. For example, if a mahout or cawadi's salary is more than or equal to Rs.60, 000 (1 US\$ = 43.75) per year, he gets a rating of 10. The rating reduces as the salary decreases with a wage of Rs.10, 000–20,000 getting a rating of 2.

There were seven mahouts with more than one elephant per mahout/cawadi in most cases. Rani did not have any mahout/cawadi attached to her. Welfare status and work experience of mahout was assessed across 15 parameters each (Figure 19). Overall mean value for mahout/cawadi was 6.9 (SE = 0.43, N = 15).

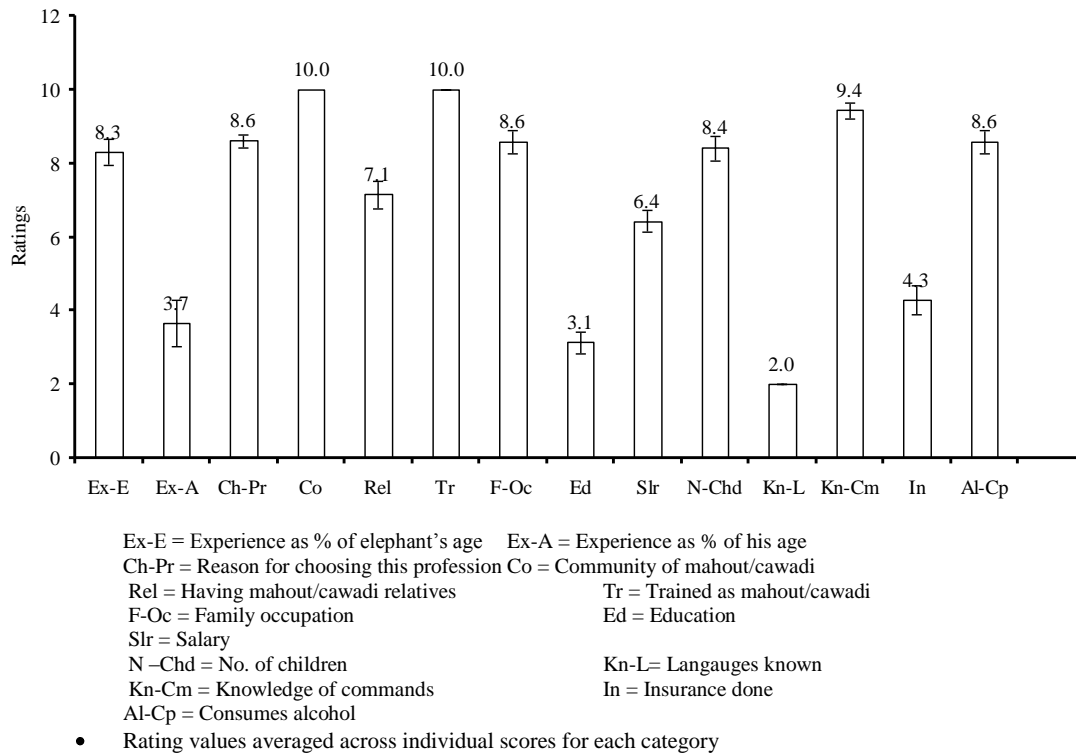


Figure 19: Mean rating for mahouts.

Experience as a mahout/cawadi which accounts for >50 % of his age indicates longer duration spent in this profession. Hence, it is given a score of 10. Lesser percentages are given lower ratings. Mean value for mahout/cawadi is 8.3 (SE = 0.36, N = 5).

The more time a mahout/cawadi spends with his elephant, the more he will know about the animal's idiosyncrasies, this being true for the elephant also in relation to the mahout/cawadi's behaviour. Mean value for mahout/cawadi is 3.7 (SE = 0.64, N = 4). As the profession of handling elephants has a long historical tradition with generations of a family practicing it, family occupation is rated for each mahout/cawadi. High rating scores are given for mahout/cawadi's families which practised the same profession. The mean value for mahout/cawadi is 8.6 (SE = 0.32, N = 7).

Wages determine the ability of a person to maintain a household. Deficiency in meeting the family's requirements may be expressed in ways that may affect work performance. Wages were scored such that an income that equaled or exceeded Rs. 5000 per month was rated as good. Mean value for mahout/cawadi was 6.43 (SE = 0.3, N = 7). Handling elephants can be dangerous for the mahout/cawadi as unforeseen situations may result in injury or death of the handler when the animal becomes uncontrollable. Kurt and Garai (2007) mention several such instances in captive

conditions. In this context, insurance cover for the person provides a degree of security for the mahout/cawadi's family.

Mean value for mahout/cawadi is 4.3 (SE = 0.39, N = 7). Alcohol consumption is a practice deleterious to the handler as well as to the animal. Mean value for mahout/cawadi is 8.6 (SE = 0.32, N = 7).

Discussion

Rating of each parameter represents the suitability of that feature in the context of the animal's welfare. Rating values between 7.5 and 10 represent satisfactory welfare conditions while those between 5.5 and 7.4 imply a moderate state. Values from 3.5 to 5.4 indicate poor state of welfare. Ratings between 0.0 and 3.4 represent bad conditions of welfare.

Sixty-six percent of the rating values were given a score in the "satisfactory" category, i.e., ranging from 7.5 to 10.0. The overall mean value for this camp, when considered across individual scores for each animal, is 7.9 (SE = 0.003, N = 680) indicating satisfactory welfare status in general. Kurt and Garai (2007) also evaluated the significance of different keeping systems of captive Asian elephants.

The following parameters are given a mean rating below 6; they need to be considered as they represent poor to bad welfare conditions:

1. Availability of water

The elephants did not have access to running sources of water such as rivers/streams. At times, water is provided in buckets which imply that the animal cannot access it when it needs to drink or bathe.

2. Chain-related variables:

Camp elephants are allowed to range free but tying with drag chains offsets this benefit. The more free ranging time an elephant has, the greater is its welfare. Tying chains around the animal to ensure its return at the appropriate time or tracking is easier will adversely affect the elephant.

The practice of chaining even the younger elephants needs to be reviewed. Use of drag chains when 50% of the juvenile elephants are related to each other either as half-sibs or as offspring is not warranted as it is unlikely that these animals will wander away from their group. Kurt and Garai (2007) stress on the relation between chaining of elephants and the resultant injuries or wounds caused from abrasion to the skin.

3. Work type

Work type involves carrying tourists in the national park within a rigid time frame or schedule. The provision of food/water or rest while working needs to be considered. Also, a more flexible routine might be less taxing for the working animals.

4. Disease/injury occurrence

Health status appears to be of a nature that might not lead to further health problems, but ailments cannot be cured easily. The occurrence of stomach-related disorders on a consistent basis among the animals needs to be taken care of.





5. Physiological tests, body measurements and vaccination schedule

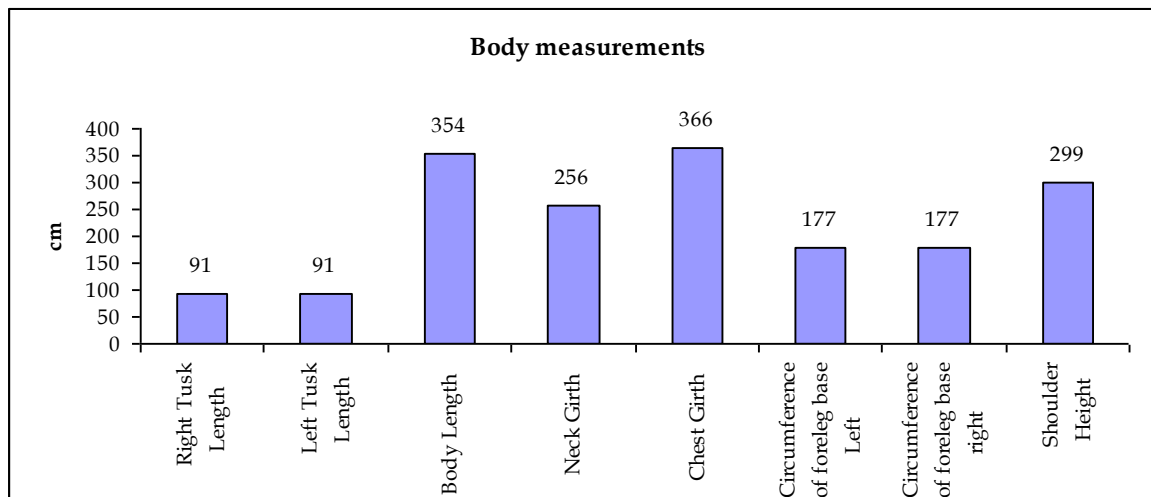
Tests of dung/urine/blood were not done for any of the elephants. Weight measurements were also not taken. Both these parameters are important indicators of the animal's health. None of the elephants had been vaccinated.

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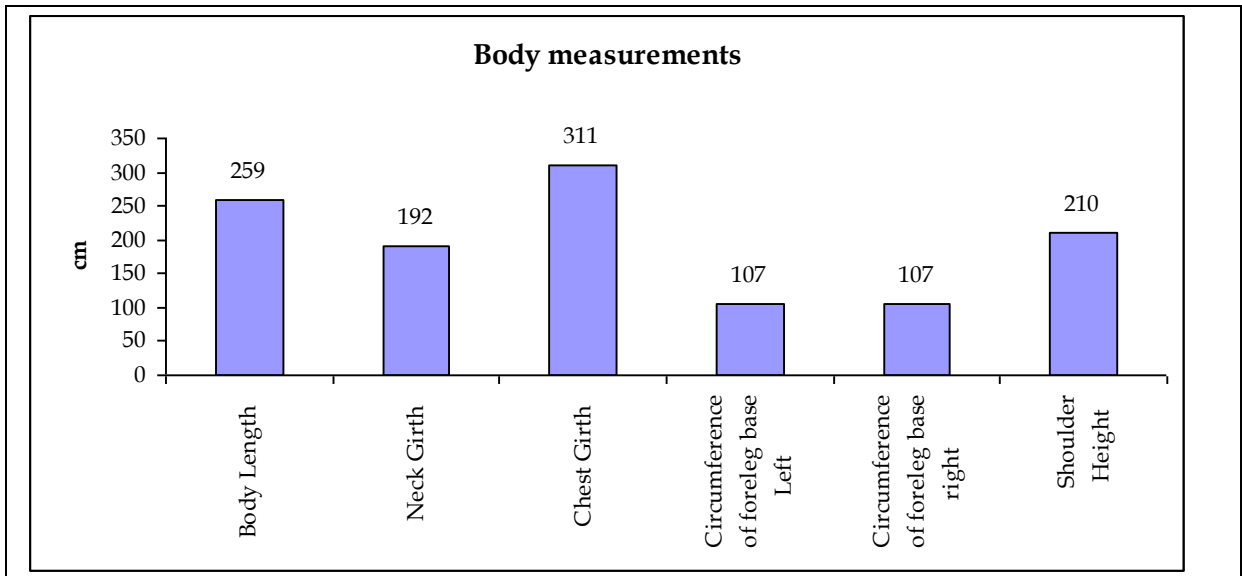
Profiles of elephants

Elephant profiles		
Name of elephant Sex Age (years) Location State Tusk type Source Date of birth Age/height at capture Location of capture Reason Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals interacts with Personality Number of people killed/ injured Stereotypic behaviour Type of work Hours/day Source of food Type Number of calf sired Disease reported Veterinary doctor availability Changes of mahout	Jayaprakash Male 45 Bandipur Karnataka Tusks full Captured Not known 9 (years) N. Begur Submersion of forest near Kabini Forest Earthen Tank Yes 24 h 13 Docile Nil Yes Carrying tourists on howdah 4 h Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt NA Diarrhoea Yes 3	   







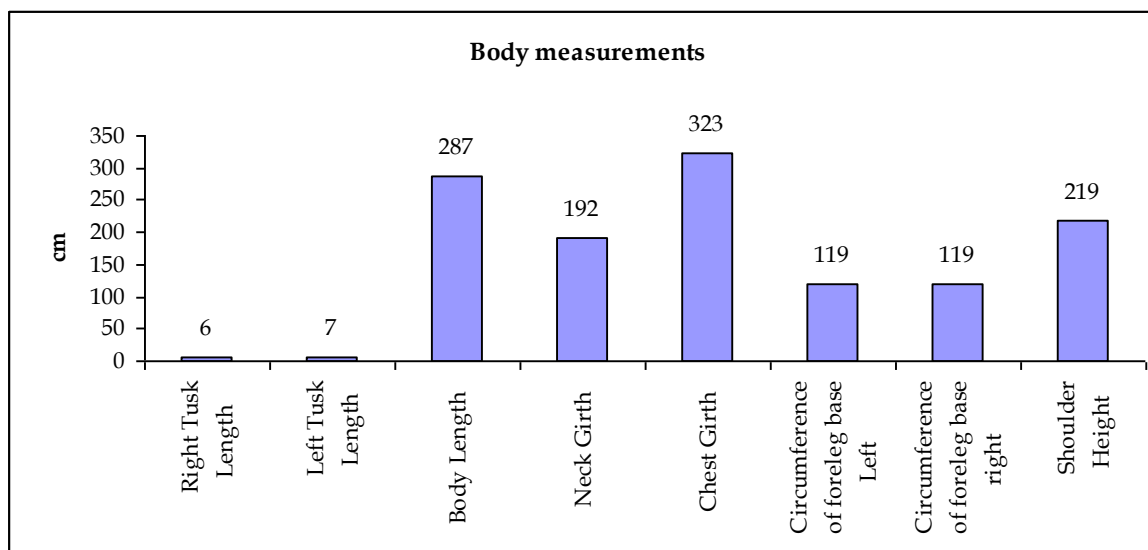
Mahout's name	Kullaiah	Cawadi's name	Masti
Age	47	Age	25
Total experience as a mahout (in relation to his age)	68%	Total experience as a cavadi (in relation to his age) %	24%
Total experience with this elephant (in relation to the elephant's age)	18%	Total experience with this elephant (in relation to the elephant's age) %	13%
Community	Tribal	Community	Jenu Kuruba
Source training	Experience	Source of training	Experience
Family occupation	Mahout	Family occupation	Mahout
Education	4th standard	Education	Not educated
Salary/year	Rs 132,000	Salary/year	Rs 30,000
Job status	Permanent	Job status	Temporary
Marital status	Married	Marital status	Married
Number of children	3	Number of children	1
Usage of tools	Yes	Usage of tools	Yes
Type	Stick	Type	Ankush, stick
Health status	Good	Health status	Good
Insurance	Yes	Insurance	No
Source	Self	Source	NA
Will his children join this profession?	Yes	Will his children join this profession?	No

Elephant profile		
Name of elephant Sex Age (years) Location State Tusk/Tushes Source Date of birth Age/Height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals interacted Personality Number of people killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Occurrence of heat cycles Calves born till date Disease reported Veterinary doctor availability Change of mahout	Diana Female 13 Bandipur Karnataka Full Captive born 26.03.1995 Not known Bandipur Forest Earthen Tank Yes 24 h 13 Usually docile, but moody (has thrown-off three people, but not injured) Nil No Carrying tourists on howdah 4 h Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt NA 1 Diarrhoea Yes No change	   








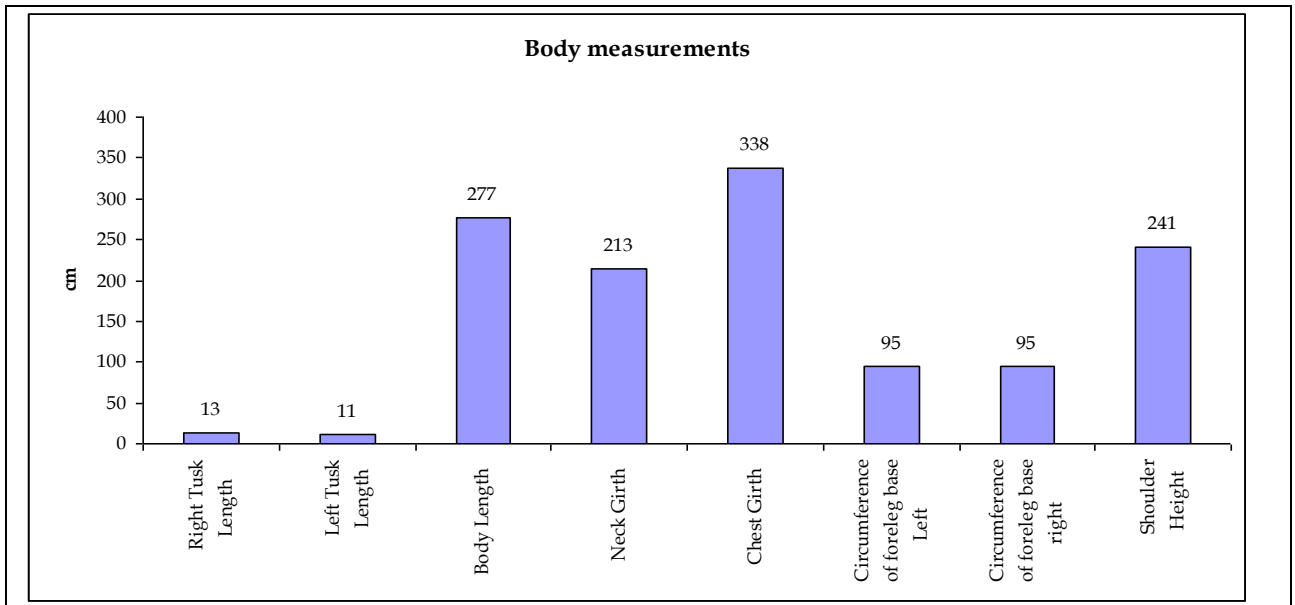
Mahout's name	Bhoja	Cawadi Name	No Cawadi for Diana
Age	40	Age	
Total experience as a mahout (in relation to his age)	50%	Total experience as a cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	77%	Total experience with this elephant (in relation to elephant's age) %	
Community	Jenu Kuruba	Community	
Source of training	Experience	Source of training	
Family occupation	Mahout	Family occupation	
Education	Not educated	Education	
Salary/year	Rs 50,000	Salary/year	
Job status	Permanent	Job status	
Marital status	Married	Marital status	
Number of children	2	Number of children	
Usage of tools	Yes	Usage of tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	Yes	Insurance	
Source	Self	Source	
Will his children join this profession?	No	Will his children join this profession?	

Elephant profile		
Name of elephant Sex Age (years) Location State Tusk Source Date of birth Age/Height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality Number of people killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Occurrence of heat cycles Calves born till date Disease reported Veterinary doctor availability Change of mahout	Theresa Female 12 Bandipur Karnataka Tushes, full Captive born 16.08.1995 Not known Bandipur Camp Forest Earthen River Yes 24 h 13 Usually docile, but moody (had thrown-off three people, but not injured) Nil No 4 h NA Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt NA 1 Diarrhoea Yes No change	   







Mahout's Name	B. Kullaiah	Cawadi's Name	Mahendra
Age	45	Age	26
Total experience as a mahout (in relation to his age)	64%	Total experience as a cavadi (in relation to his age) %	12%
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	25%
Community	Jenu Kuruba	Community	Jenu kuruba
Source of training	Yes	Source of training	Not trained
Family occupation	Mahout	Family occupation	Coolie (Labourer)
Education	Not educated	Education	Not educated
Salary/year (Rs)	Rs 62,000	Salary/year	Rs 28000
Job status	Permanent	Job status	Temporary
Marital status	Married	Marital status	Married
Number of children	3	Number of children	2
Usage of tools	Yes	Usage of tools	Yes
Type	Stick	Type	Stick, Ankush
Health status	Good	Health status	Good
Insurance	Yes	Insurance	No
Source	GPF, KID	Source	NA
Will his children join this profession?	NO	Will his children join this profession?	No





Elephant profile		
Name of elephant	Chaitra	
Sex	Female	
Age (years)	36	
Location	Bandipur	
State	Karnataka	
Tusk	Tushes, full	
Source	Captive born	
Date of birth	1971	
Age/height at birth	Not known	
Location of birth	Bandipur camp	
Type of shelter	Forest	
Type of flooring	Earthen	
Source of water	Tank	
Interaction with other elephants	Yes	
Hours/day	24 h	
Number of individuals	13	
Personality	Disobeys	
Number of people killed/injured	Nil	
Stereotypic behaviour	No	
Type of work	Carrying tourists on howdah	
Hours/day	4 h	
Source of food	Free ranging and stall- fed	
Type	Horse gram, ragi, jaggery, coconut, salt	
Occurrence of heat cycles	NA	
Calves born till date	4	
Disease reported	Diarrhoea	
Veterinary doctor availability	Yes	
Changes of mahout	2	
		
		

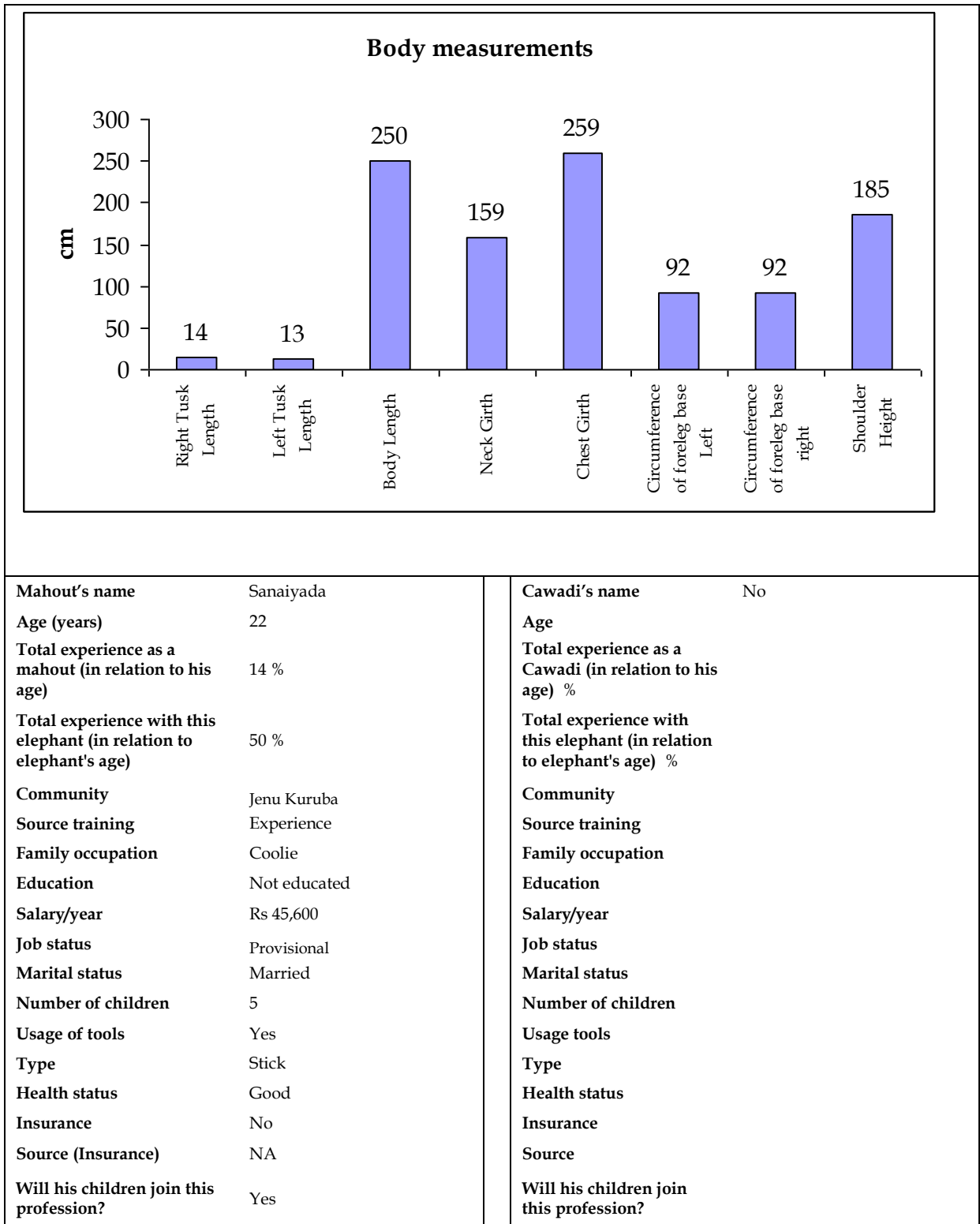






Mahout's name	Chennappa	Cawadi's name	No cawadi for Prithviraj
Age	35	Age	
Total experience as a mahout (in relation to his age)	46%	Total experience as a cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	3%	Total experience with this elephant (in relation to elephant's age) %	
Community	Jenu Kuruba	Community	
Source of training	Experience	Source of training	
Family occupation	Mahout	Family occupation	
Education	5th standard	Education	
Salary/year	Rs 51,600	Salary/year	
Job status	Permanent	Job status	
Marital status	Married	Marital status	
Number of children	4	Number of children	
Usage of tools	Yes	Usage of tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	Yes	Insurance	
Source	GPF, KJD	Source	
Will his children join this profession?	NO	Will his children join this profession?	

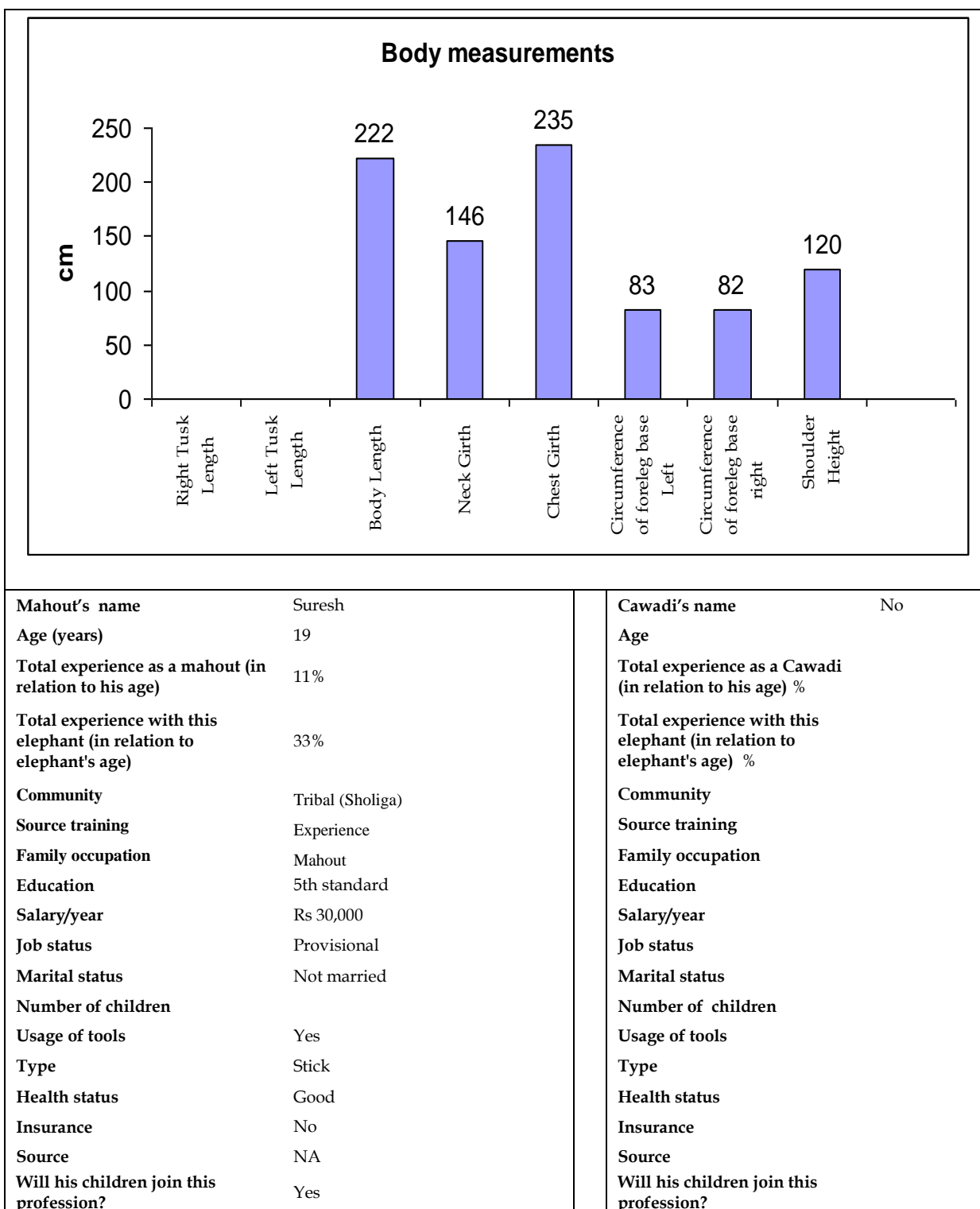
Elephant profile		
Name of elephant Sex Age (years) Location State Tusk Source Year of source Age/ height at confiscation Location Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality Number of people killed/ injured Stereotypic behaviour Type of work Hours/day Source of food Type Occurrence of heat cycles Calves born till date Disease reported Veterinary doctor availability Changes of mahout	Rani Female 60 Bandipur Karnataka NA Confiscated 2002 54 years Not known Free ranging Earthen Tank Yes 24 h 13 Docile Nil No No work NA Free-ranging and stall fed Horse gram, ragi, jaggery, coconut, salt Not known No Diarrhoea Yes Yes	
		
		





Mahout's name	No mahout	Cawadi Name	No Cawadi
Age		Age	
Total experience as a mahout (in relation to his age) %		Total experience as a cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age) %		Total experience with this elephant (in relation to elephant's age) %	
Community		Community	
Source of training		Source of training	
Family occupation		Family occupation	
Education		Education	
Salary/year		Salary/year	
Job status		Job status	
Marital status		Marital status	
Number of children		Number of children	
Usage of tools		Usage of tools	
Type		Type	
Health status		Health status	
Insurance		Insurance	
Source		Source	
Will his children join this profession?		Will his children join this profession?	

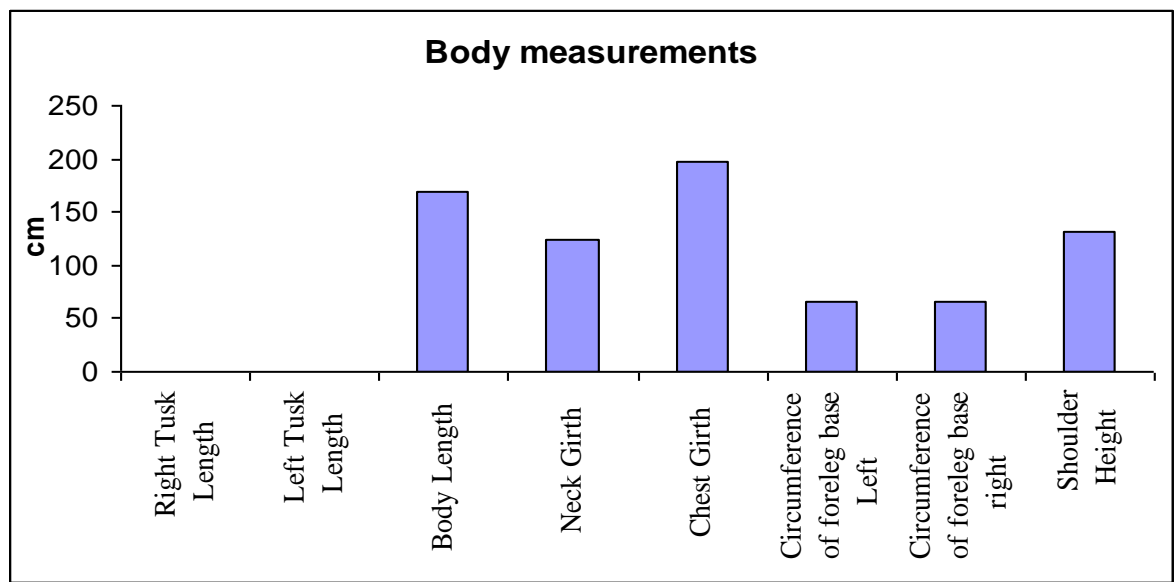
Elephant profile		
Name of elephant Age (years) Sex Location State Makhna/Tusker Tusk type Source Year of birth Age/height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality People killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Status of musth Number of calf sired Permanent injury/handicap Disease reported Veterinary doctor availability Changes of mahout	Rajendra 4 Male Bandipur Karnataka Tusker Small tusks Captive born NA NA NA Free ranging Earthen Tank Yes 24 h 13 Docile Nil No No work No Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt No NA No Diarrhoea Yes None	   







Elephant profile		
Name of elephant Age (years) Sex Location State Makhna/Tusker Tusk type Source Year of birth Age/height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality People killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Occurrence of heat cycles Calves born till date Permanent injury/handicap Disease reported Veterinary doctor availability Changes of mahout	Roopa/Seetha 4 Female Bandipur Karnataka NA NA Captive born Open, natural Earthen Tank Yes 24 h 13 Docile Nil No No work NA Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt Not known No No Diarrhoea Yes 1	   

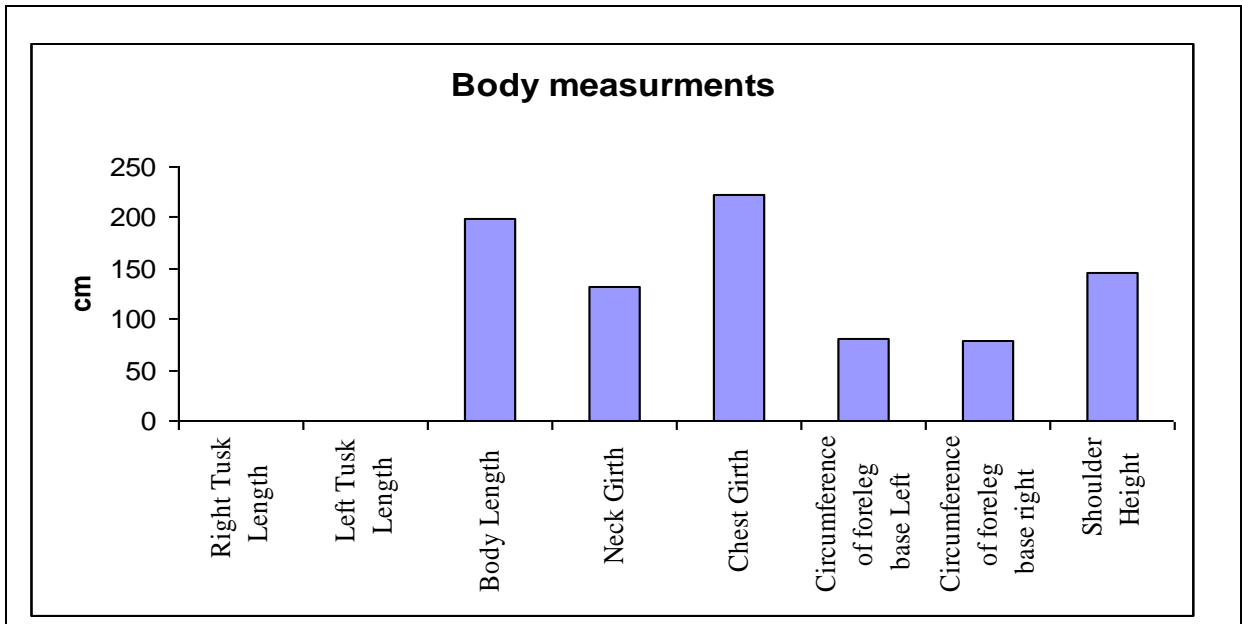


Elephant profile		
Name of elephant Age (years) Sex Location State Makhna/Tusker Tusk Type Source Year of rescue Age/height at rescued Location of rescue Reason Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality People killed/injured Stereotypic behaviour Type of work Hours day Source of food Type Status of musth Number of calf sired Permanent injury/ handicap Disease reported Veterinary doctor availability Changes of mahout	Mruthinjai 2 Male Bandipur Karnataka Tusker No Orphan 2004 15 days Mangala Separated from mother Open, natural Earthen Tank Yes 24 h 13 Disobeys Nil No No work NA Free ranging and stall-fed Horse gram, ragi, jaggery, coconut, salt NA None No Diarrhoea Yes No	   

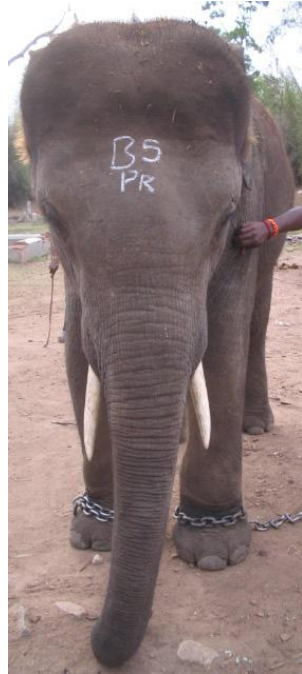





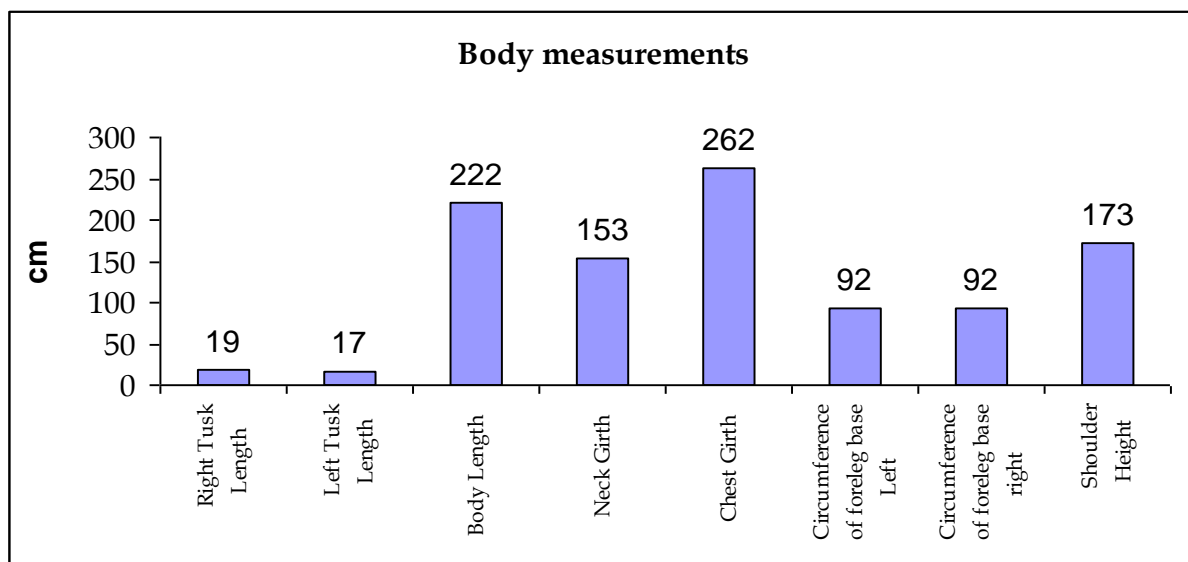
Mahout's name	Chandrashekar	Cawadi name	No
Age (years)	28	Age	
Total experience as a mahout (in relation to his age)	29%	Total experience as a Cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	
Community	Tribal (Betta Kurumba)	Community	
Source training	Experience	Source of training	
Family occupation		Family occupation	
Education	8th standard	Education	
Salary/year	Rs 30,000	Salary/year	
Job status	Provisional	Job status	
Marital status	Married	Marital status	
Number of children	2	Number of children	
Usage of tools	Yes	Usage tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	No	Insurance	
Source	NA	Source	
Will his children join this profession?	Not known	Will his children join this profession?	

Elephant profile		
Name of elephant	Padmaja	
Age (years)	6	
Sex	Female	
Location	Bandipur	
State	Karnataka	
Makhna/Tusker	NA	
Source	Orphan	
Year of capture	4 months	
Age/height at capture	Not known	
Location of capture	Moolehole Forest	
Reason	Mother rejected after a fire accident	
Type of shelter	Free ranging, chained 1.5 h	
Type of flooring	Earthen	
Source of water	Tank	
Interaction with other elephants	Yes	
Hours/day	24 h	
Number of individuals	13	
Personality	Docile	
People killed/injured	Nil	
Stereotypic behaviour	No	
Type of work	No work	
Source of food	Free ranging and stall fed	
Type	Horse gram, ragi, jaggery, coconut, salt	
Status of musth	NA	
Number of calf sired	None	
Permanent injury/ handicap	No	
Disease reported	Diarrhoea	
Veterinary doctor availability	Yes	
Changes of mahout	No change	







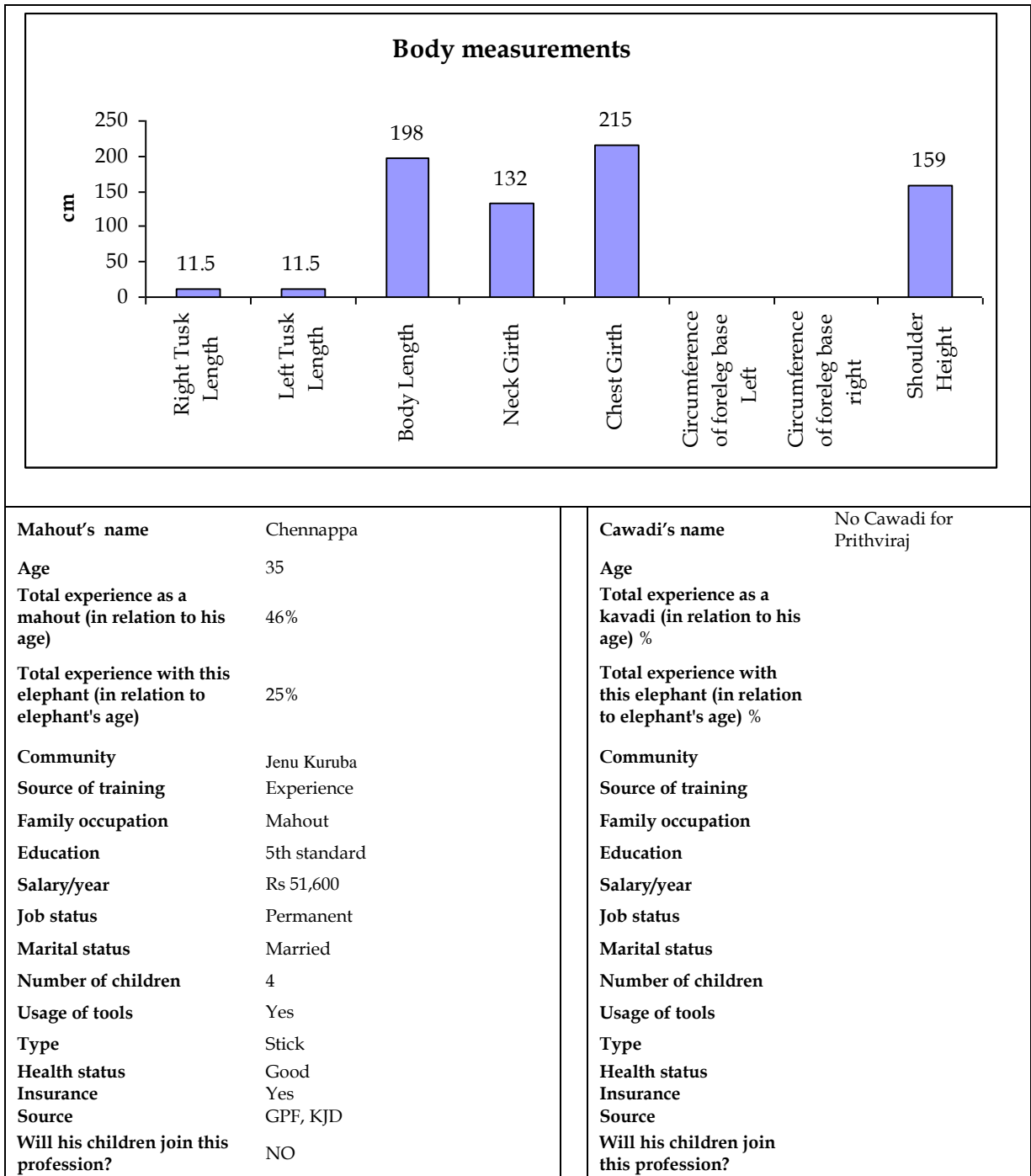
Mahout's name	Chandrashekar	Cawadi Name	No
Age (years)	28	Age	
Total experience as a mahout (in relation to his age)	29%	Total experience as a Cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	
Community	Tribal (Betta Kurumba)	Community	
Source training	Experience	Source training	
Family occupation	Elephant	Family occupation	
Education	8th standard	Education	
Salary/year	Rs 30,000	Salary/year	
Job status	Provisional	Job status	
Marital status	Married	Marital status	
Number of children	2	Number of children	
Usage of tools	Yes	Usage tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	No	Insurance	
Source	NA	Source	
Will his children join this profession?	Not known	Will his children join this profession?	





Elephant profile		
Name of elephant	Pritiviraj	
Sex	Male	
Age (years)	6	
Location	Bandipur	
State	Karnataka	
Tusk	Tusk visible	
Source	Orphaned	
Date of source	4 months	
Age/Height at source	Not known	
Location of source	Moolehole forests	
Reason	Mother rejected after a fire accident	
Type of shelter	Free ranging, chained 1.5 h	
Type of flooring	Earthen	
Source of water	Tank	
Interaction with other elephants	Yes	
Hours/day	24 h	
Number of individuals	13	
Personality	Disobeys	
Number of people killed/injured	Nil	
Stereotypic behaviour	No	
Type of work	No work	
Hours/day	NA	
Source of food	Free ranging and stall-fed	
Type	Horse gram, ragi, rice, jaggery, salt, and coconut	
Status of musth	NA	
Number of calf sired	None	
Disease reported	Diarrhoea	
Veterinary doctor availability	Yes	
Changes of mahout	Nil	

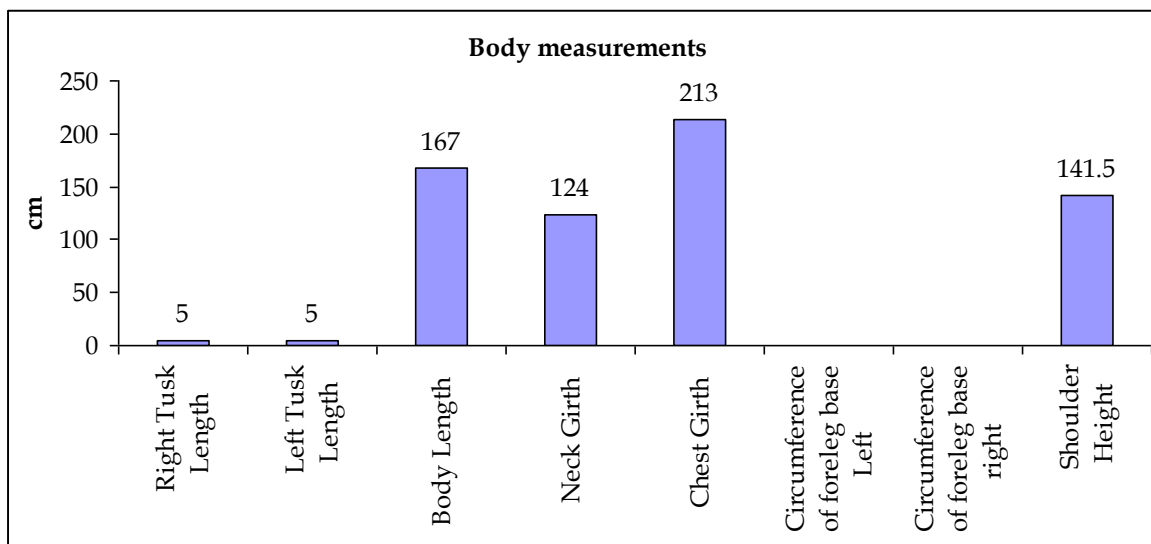


Mahout's name	Kalan	Cawadi Name	No Cawadi for Prithviraj
Age (years)	23	Age	
Total experience as a mahout (in relation to his age)	35%	Total experience as a Cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	
Community	Tribal (Jenu Kuruba)	Community	
Source of training	Experience	Source of training	
Family occupation	Elephant	Family occupation	
Education	4th standard	Education	
Salary/year	Rs 15,000	Salary/year	
Job status	Provisional	Job status	
Marital status	Not married	Marital status	
Number of children		Number of Children	
Usage of tools	Yes	Usage of tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	No	Insurance	
Source	NA	Source	
Will his children join this profession?	NA	Will his children join this profession?	

Elephant profile		
Name of elephant Sex Age (years) Location State Tusk Source Date of birth Age/Height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality Number of people killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Status of musth Number of calf sired Disease reported Veterinary doctor availability Changes of mahout	Hamsaraja Male 4 Bandipur Karnataka Full Captive born 2003 Not known Bandipur camp Forest Earthen Tank Yes 24 h 13 Disobeys Nil No No work NA Free ranging & stall-fed Horse gram, ragi, rice, jaggery, salt, and coconut NA No Lacerated wounds/Hernia/Diarrhoea/Papilloma Yes 2	   







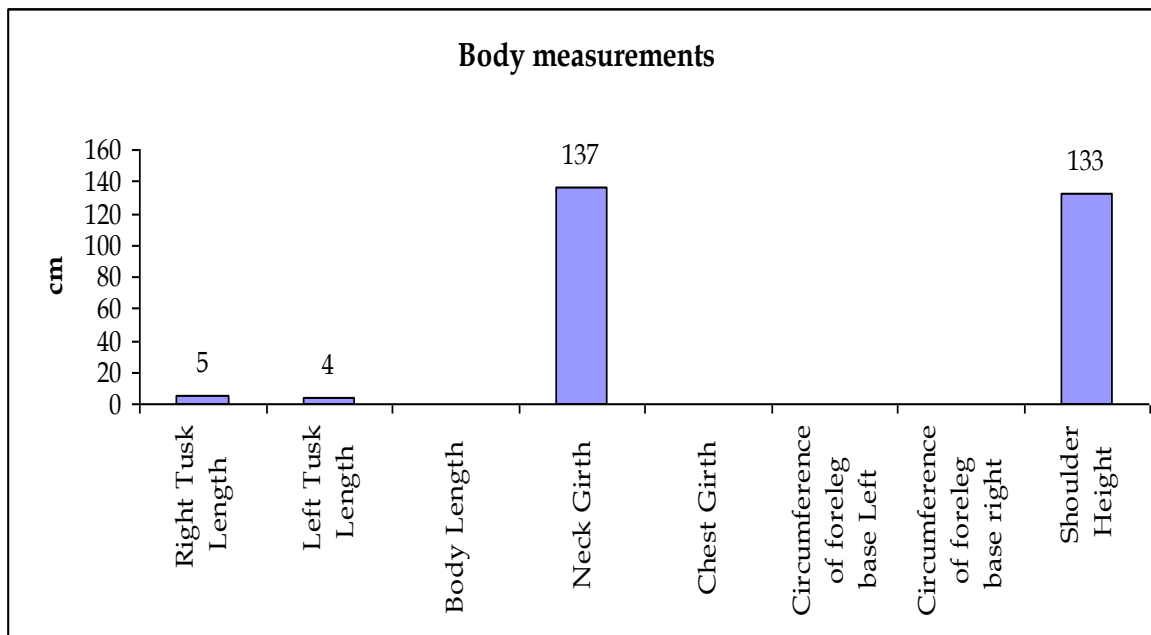
Elephant profile		
Name of elephant	Krishna	
Sex	Male	
Age (years)	1.6	
Location	Bandipur	
State	Karnataka	
Tusk	Tusk visible	
Source	Captive born	
Date of birth	2006	
Age/height at birth		
Location of birth	Bandipur camp	
Type of shelter	Forest	
Type of flooring	Earthen	
Source of water	Tank	
Interaction with other elephants	Yes	
Hours/day	24 h	
Number of individuals	13	
Personality	Docile	
Number of people killed/ injured	Nil	
Stereotypic behaviour	No	
Type of work	No work	
Hours/day	NA	
Source of food	Free ranging and stall-fed	
Type	Horse gram, ragi, rice, jaggery, salt, and coconut	
Status of musth	NA	
Number of calf sired	None	
Disease reported	None	
Veterinary doctor availability	Yes	
Changes of mahout	No change	







Mahout's name	B. Kullaiah
Age (years)	45
Total experience as a mahout (in relation to his age)	64%
Total experience with this elephant (in relation to elephant's age)	100%
Community	Jenu Kuruba
Source of training	Yes
Family occupation	Mahout
Education	Not educated
Salary/year	62,000
Job status	Permanent
Marital status	Married
Number of children	3
Usage of tools	Yes
Type	Stick
Health status	Good
Insurance	Yes
Source	GPF, KID
Will his children join this profession?	NO

Cawadi 's name	No Cawadi for
Age	
Total experience as a kavadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	
Community	
Source of training	
Family occupation	
Education	
Salary/year	
Job status	
Marital status	
Number of children	
Usage of tools	
Type	
Health status	
Insurance	
Source	
Will his children join this profession?	

Elephant profile		
Name of elephant Sex Age (years) Location State Tusk Source Date of birth Age/height at birth Location of birth Type of shelter Type of flooring Source of water Interaction with other elephants Hours/day Number of individuals Personality Number of people killed/injured Stereotypic behaviour Type of work Hours/day Source of food Type Status of musth Number of calf sired Disease reported Veterinary doctor availability Changes of mahout	Manikandan Male 1.3 Bandipur Karnataka Not visible Captive born 2006 Bandipur camp Forest Earthen Tank Yes 24 h 13 Docile Nil No No work NA Free ranging and stall- fed Horse gram, ragi, rice, jaggery, salt, and coconut NA None None Yes 2	   



Mahout's name	Chennappa	Cawadi Name	No Cawadi
Age	35	Age	
Total experience as a mahout (in relation to his age)	46%	Total experience as a cawadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	
Community	Jenu Kuruba	Community	
Source of training	Yes	Source of training	
Family occupation	Mahout	Family occupation	
Education	5th standard	Education	
Salary/year	Rs 51,600	Salary/year	
Job status	Permanent	Job status	
Marital status	Married	Marital status	
Number of children	4	Number of children	
Usage of tools	Yes	Usage of tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	Yes	Insurance	
Source	GPF, KID	Source	
Will his children join this profession?	No	Will his children join this profession?	

Elephant profile		
Name of elephant Bhatra (Diana Calf) Sex Male Age (years) 1.2 Location Bandipur State Karnataka Tusk Not visible Source Captive born Date of birth 2007 Age/Height at birth Location of birth Bandipur camp Type of shelter Forest Type of flooring Earthen Source of water Tank Interaction with other elephants Yes Hours/day 24 h Number of individuals 13 Personality Docile Number of people killed/injured Nil Stereotypic behaviour No Type of work No work Hours/day NA Source of food Free ranging and stall-fed Type Horse gram, ragi, rice, jaggery, salt, and coconut Status of musth NA Number of calf sired NA Disease reported No Veterinary doctor availability Yes Changes of mahout No change		
		
		

Mahout's name	Bhoja	Cawadi Name	No cawadi
Age	40	Age	
Total experience as a mahout (in relation to his age)	50%	Total experience as a kavadi (in relation to his age) %	
Total experience with this elephant (in relation to elephant's age)	100%	Total experience with this elephant (in relation to elephant's age) %	
Community	Jenu Kuruba	Community	
Source of training	Experience	Source of training	
Family occupation	Mahout	Family occupation	
Education	Not educated	Education	
Salary/year	Rs 50,000	Salary/year	
Job status	Permanent	Job status	
Marital status	Married	Marital status	
Number of children	2	Number of children	
Usage of tools	Yes	Usage of tools	
Type	Stick	Type	
Health status	Good	Health status	
Insurance	Yes	Insurance	
Source	NA	Source	
Will his children join this profession?		Will his children join this profession?	

Appendix 1: Welfare parameters and their rating scale for Bandipur elephant camp

Source of elephant		
S.no	Variables	Rating value
1	Captive born	10
2	Orphaned/rescue	5
3	Purchased/received/transferred/unknown	2.5
4	Captured	1
Enclosure/shelter type		
A	Free ranging—natural shade	10
B	Free ranging within any man-made enclosure	
1	With thatch	5
2	With concrete	4
3	With tin/plastic sheet/asbestos	3
C	Shelter as a structurally enclosed space	2.5
D	No man-made structures, no free range, natural conditions	1.0
E	No natural conditions + no man-made structures	0.0
Enclosure/Shelter size		
A	Free ranging	10
B	5000 sq m (=1.25*4047)	8
C	3750	6
D	2500	4
E	1250	2
F	less	0
Duration of free range		
A	Free ranging (max.) 20 h	10
B	18 h	9
C	16 h	8
D	14 h	7
E	12 h	6
F	10 h	5
G	8 h	4
H	6 h	3
I	4 h	2
J	2 h	1
K	0	0
Flooring		
A	Earthen	10
B	Concrete/any hard surface	0
Shade availability		
A	No shade	0
B	Shade available	10

Shade type		
A	a. Free ranging (natural shade)	10
B	b. Free ranging within any man-made enclosure	
I	i. With thatch	5
II	ii. With concrete	4
III	iii. With tin/plastic sheet/asbestos	3
C	c. Shade as a structurally enclosed space	2.5
	i. Shade as structurally enclosed space + natural shade	2.5
	ii. Shade as structurally enclosed space + no natural shade	1
D.	d. No natural conditions + no man-made structures	0
Water availability		
A	Availability of running water (river)	10
B	Large lakes/reservoirs/water holes	5
C	Smaller water bodies like tanks, ponds	4
D	Tap water (Running)	3
E	Buckets, pots, etc. and tankers	1
F	No water	0
Distance to source of water		
A	0–100 (m)	10
B	100–200	9
C	200–300	8
D	300–400	7
E	400–500	6
F	500–600	5
G	600–700	4
H	700–800	3
I	800–900	2
J	900–1000	1
K	Above 1000	0
Bathing no. of times/day (frequency of bath)		
A	At least twice	10
B	Once	9
C	Once in two days	5
D	Once a week	1
E	No bath	0
Bathing place		
A	Rivers	10
B	Large lakes/reservoirs/water holes	5
C	Smaller water bodies like tanks, ponds	4
D	Tap water (Running)	3
E	Buckets, pots, etc.	1
F	No water	0
Bath duration		
A	Within 3–4 h	10
B	2 h	6
C	1 h	5
D	30 min	2.5
E	< 30 min	0
F	Animal is allowed to free range (at night or whole day), a score of 10 is given for bath duration.	10
G	Bath duration > 5 h	0

Bathing materials		
A	Natural materials like 'Mundakai/Pandanus'	10
B	Hard material	4
C	Hard material (plastic brush, stone)	2
D	No material	0
Drinking water No. of times per day		
1. Animal with free ranging status (assuming 20 h/day)		
A	Free ranging (in natural forest conditions) (max.) 20 h	10
B	18	9
C	16	8
D	14	7
E	12	6
F	10	5
G	8	4
H	6	3
I	4	2
J	2	1
K	0	0
2. Not free-ranging: (animal has to get 150 l of water)		
A	> 6 times + each mouthful	10
B	5 times	8
C	4	6
D	3	5
E	1	2.5
F	0	0
3. Partly free ranging + partly no free ranging		
A	Semi-natural, exposed to source of running water	10
B	Semi-natural, exposed to artificial sources of water (buckets/any other container)	5
C	Kept in unnatural conditions, given about 100 l/day	4
D	Kept in unnatural conditions, given < 100 l/day	2
Place of sleep		
A	Sleep (natural conditions)	10
B	Sleep within any man-made enclosure	
i	With thatch	5
ii	With concrete	4
iii	With tin/plastic sheet/asbestos	3
iv	Sleep in a shelter as only structure + no natural conditions	2.5
v	Tied with a 10 m chain (where the animal is restricted in its movement)	2.5
vi	Sleeping place as < =1 m chain	0
vii	No natural conditions + no man-made structures	0
Sleep area (size)		
A	Natural conditions	10
B	Free within enclosure	5
C	10 m chain	2.5
D	</ =1 m chain	0

Duration of sleep (night)		
A	4 h	10
B	<4	5
C	<3	4
D	<2	3
E	<1	2
F	0	0
G	When elephant sleeps during the day also, score for sleep duration averaged across day and night. Score for sleeping during the day	0
Walking		
A	Natural/free range	10
B	No walk	0
Time of walk		
A	Early morning + late hours + natural terrain	10
B	Early morning + early evening, but hard surface	5
C	Late morning + early evening + hard surface	1.25
	• Time of walk: in forest, time ignored and given score of 10.	
Interaction–Yes/No		
A	Yes	10
B	No	0
Type of Interaction (group size)		
A	Anything that replicates natural group size	10
B	No free ranging but ideal interaction conditions	8
A	Free-ranging conditions within a group, interaction allowed with ideal group size	10
B		
A	All females	8
B	> Adult females with few sub-adults better than all adult female	7
	No free ranging, M + F / F + F	6
	Adult females with few sub-adults	8
	All females/male + female	7
	All male	5
	All male + calf	2.5
Interaction distance		
A	Within 2 m	10
B	> 2 m	0
Interaction (in hours)		
A	24	10
B	22.5	9
C	20	8
D	17.5	7
E	15	6
F	12.5	5
G	10	4
H	7.5	3
I	5	2
J	2.5	1
K	0	0

Chaining		
A	Yes	0
B	No	10
Region of chaining		
A	One leg with long chain (10 m)	5
B	One leg, chain length unknown	2.5
C	One leg with short chain	1
D	One leg, chain length unknown	0
Free ranging with chains, two legs hobbled		
A	Yes	0
B	No	10
C	With drag chain	5
Behaviour		
A	Quiet/docile/calm/predictable	10
B	Aggressive	0
C	Undependable/ unpredictable	0
D	Predictable	10
Injured/kill (Aggressive behaviour)		
A	Yes	0
B	No	10
Stereotypic		
A	Yes	0
B	No	10
Intensity of stereotypy		
A	Low	5
B	Medium	2.5
C	High	0
Work		
A	No + free ranging	10
B	Patrolling	8
C	'Kunki' for human–animal conflict mitigation	6
D	Safari	5
E	Timber	2.5
F	Standing 'pooja'	1.25
G	Procession	0.625
H	Blessing and begging	0
Food		
A	Free ranging + stall-fed = 10	10
B	Only free ranging	8
C	Only stall-fed	0

Type of food (No. of items)		
A	Forest food with supplement	10
B	Forest food only	8
		Value depends on the number of items
C	No forest food, only varieties	
Use of ration chart		
A	Yes	10
B	No	0
Reproduction: Female		
Cycling		
A	Yes	10
B	No	0
Exposed to male		
A	Yes	10
B	No	0
Mating observation		
A	Yes	10
B	No	0
Nature of mating (Male source)		
A	Wild	10
B	Captive	8
C	No	0
Cow presence		
A	Yes	10
B	No	0
Male		
Exposed to female		
A	Yes	10
B	No	0
'Musth'		
A	Adult -Yes	10
B	Adult-No	0
Occurrence of disease/injuries/medical problems		
A	Yes	0
B	No	10
Frequency of occurrence of disease		
A	Regular	0
B	Occasional	5
C	Rare	8

(Health status) Nature of disease/Injury		
A	Harmful, painful, leads to low health status, non-curable or chronic	0
B	Less harmful/painful, but leads to health problems, non-curable	1
C	Less harmful/painful, but leads to health problems, curable	2
E	Leads to no further health problems, treatment status unknown	3
F	Leads to no further health problems, non-curable	4
G	Leads to no further health problems, but not easily cured	6
H	Easily cured	8
De-worming		
A	Yes	10
B	No	0
De-worming done		
A	Regular	10
B	Occasional	5
C	Rare	2.5
Vaccination		
A	Yes	10
B	No	0
Oiling		
A	Yes	10
B	No	0
Oiling done (frequency)		
A	Regularly	10
B	Occasionally	5
C	Rarely	2.5
Blood, urine, dung sample		
A	Yes	10
B	No	0
Body weight measurement		
A	Yes	10
B	No	0
Body measurement		
A	Yes	10
B	No	0
Veterinary care		
Availability of doctor		
A	Yes	10
B	No	0
Veterinary Assistant		
A	Yes	10
B	No	0

Doctor's experience with elephants		
A	Yes	10
B	No	0
Doctor's experience with elephants (years)		
A	Above 30	10
B	20–30	8
C	10–20	6
D	1–10	4
E	Less than 1 year	2
F	No experience	0
Frequency of doctor's visit		
A	Daily	10
B	Weekly twice	8
C	On call	6
D	Monthly	4
E	Occasionally	2
F	No	0
Facilities		
A	Yes	10
B	No	0
Maintenance of service, clinical and other records		
A	Yes	10
B	No	0
Mahout		
Total experience with this elephant (in relation to elephant's age) %		
A	Above 40–50	10
B	30–40	7.5
C	20–30	5
D	10–20	2.5
E	5–10	1.25
F	2–5	0.625
G	1–2	0.3125
H	0	0
Total experience as a mahout (in relation to his age) %		
A	Above 40–50	10
B	30–40	7.5
C	20–30	5
D	10–20	2.5
E	5–10	1.25
F	2–5	0.625
G	1–2	0.3125
H	0	0
Became a mahout because		
A	Tradition and interest	10
B	Interest	9
C	Tradition	8
D	No other job	0

Community		
A	Tribal/Muslim	10
B	Others	5
Family occupation		
A	Mahout	10
B	Others	0
Related to other mahouts or cawadis		
A	Yes	10
B	No	0
Annual salary (Rs)		
A	60,000	10
B	40–50,000	8
C	30–40,000	6
D	20–30,000	4
E	10–20,000	2
Education		
A	10th	10
B	9th	9
C	8th	8
D	7th	7
E	6th	6
F	5th	5
G	4th	4
H	3rd	3
I	2nd	2
J	1st	1
K	None	0
Children		
A	2	10
B	2–4	8
C	4–6	6
D	6–8	4
E	8–10	2
F	Above 10	0
Languages known		
A	Above 4	10
B	4	8
C	3	6
D	2	4
E	1	2
F	0	0
Knowledge of using commands		
A	Good	10
B	Average	6
C	Bad	3
D	No	0

Insurance		
A	Yes	10
B	No	0
Consumption of alcohol		
A	Yes	0
B	No	10
Timings of consumption (frequency)		
A	No	10
B	After work	5
C	Before work	2.5
D	While working	0

Project team

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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, it has worked in close collaboration with government departments and agencies on various projects. CUPA's mission is to protect animals from abuse and violence and do what may be required to alleviate their suffering at the hands of humans. CUPA does not differentiate between pet, stray or wild animals, since both 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.

Wildlife Rescue & Rehabilitation Centre (WRRC) is a registered public charitable trust for the welfare of wild animals and birds that often find themselves trapped in an urban environment. The Trust is a sister concern of CUPA and both organizations complement each other in their services. WRRC was established as a separate trust in 1999.

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

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 thousands of supporters worldwide.

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Of the total endangered Asian elephants in India, approximately 20% are in captivity. Little is known of their management and well-being and even lesser is known of the 'mahouts' (elephant handlers) and 'cawadis' (assistants). This investigation aims at measuring the welfare conditions of captive elephants managed by the Forest Department at Bandipur camp. The well-being of each animal has been assessed by observing the physical environment, morphology of the animal, behavioural characteristics and physiological features along with several parameters relating to economic, social and animal-oriented attitude of mahouts. It is believed that science will help in better policy making and further advance the living conditions of elephants kept at the camp.

