

Mortality of mahouts by captive Asian elephants in Kerala, southern India

Elephant runs amok, enters railway station

Injures mahouts and causes panic for around three hours



An elephant, Vadakkunnathan Krishnan, pursues its mahouts in Thrissur on Saturday. – PHOTO: K. C. SOWMISH

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Surendra Varma, T.S.Rajeev, Marshal.C.Radhakrishnan and K.R Rajesh

Elephants in Captivity-CUPA/ANCF: Occasional Report No.14



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Preface

Elephants and mahouts' lives are inseparable. While there may not be any need for the owner to be with his elephant, and the presence of veterinary doctors are needed only when the animal is not well, the role of the elephant's mahout in deciding the positive/negative welfare of the elephant is critical. When the management is biased towards elephant part of management, the welfare of the mahouts is neglected. His commitments and responsibility in taking care of the elephant are not known.

For gaining knowledge about elephant welfare it is important to know the biology, ecology and behaviour (psychology) of the elephant; for the mahouts' welfare it is important to draw patterns from the socio-economic conditions of the mahouts. It is the combination of the two sets of people (ecologist and social scientists) which decides the welfare of the elephants and the mahouts. Mahoutry as discussed elsewhere is not an attractive and rewarding profession. As mahout has to spend considerable time with his elephant, he is not in a position to improve his lifetime skills and concentrate on providing quality time for his family and children.

Considering the difficulties and the risks involved in this profession, he may not like his children to join this profession. Initially the children who show interest in educating themselves move out of interest in becoming mahouts; however, due to poor educational skills and economy, they end up becoming mahouts, i.e., employment opportunities in this field acts as an incentive and therefore interest in being with elephants is not the reason. In this process, they lose the traditional learning process of becoming mahouts and also good formal education; their frustration is shown towards their elephants. The frustration is reflected in negligence or harassment of the animal. All these causes initiate a conflict between elephants and the mahouts. There could be other reasons such as poor management, pushing the animal to earn high economic benefit, neglecting the basic needs of the animal, exposing them to poor quality work and food regimes. In all these processes, the prime victim is the mahout as conflict between him and his elephant worsens and he pays with his life for it. On a comparable scale, the elephant too undergoes poor welfare, with killing incidents adding to an "unmanageable" notion about the animal.

The incidents of elephant attacking/ killing mahout and running amok is a cause of concern, but no systematic or even basic knowledge of the subject is available; however, it is not difficult to obtain and update. The elephants' violent behaviour of killing/attacking or running amok reflects its high level of aggression, which may be targeted at mahouts. Whatever form the nature of incident— injury/ attacking /running amok— it is a reflection of its negative interaction with its mahout.

Given the awareness level, the literacy background and the interest of reading newspapers, the details about events particularly about elephants that are considered as cultural icons appearing in news items is a good source of information. The details retrieved from the newspapers could be used to develop a specific data base of incidents related to the elephants in the state. As one reads newspapers published from Kerala,

every aspect of the elephant is covered in the media and the incidents of elephant attacking / killing of the mahout or public / running amok is not an exception. From these incidents of killing/injury/ running amok, name of the animal, elephant's age, ownership, location, time of the incident, person/victims (mahout/public) attacked and the other details could be retrieved. The accumulation of information appearing in the newspaper over a period of a time is expected to provide a pattern of consistency in all aspects. From this, patterns of incidents for a specific elephant or month, time, location could be arrived at.

For knowing the status of elephant violent behavior towards mahouts, we relied on the news items appearing from January to December 2007, details for some locations were gathered for January to December 2010 and ground verification of the information of incidents was done by interacting with owners/public on specific news items published. These instances motivated us to interview 30 mahouts (first mahouts) from where most perspectives of their job particularly their socio- economic status, motivation to become a mahout were obtained. This was done in 2009. In addition to this 30, 1st mahouts who have been attacked were interviewed in 2010, covering socio- economic profile, time of attack, nature of the injury, duration for the treatment, adequate medical/financial help, etc.

The knowledge gained through these investigations was presented as individual case studies at the Kerala Science Congress, held in 2008, 2009 and 2010 and this particular document is a combination of the three works carried out on the incidents of killing/ injuring/ running amok, mahouts' perception towards this job and the risk involved in their job. Through this document, we have mapped basic pattern and insights of the concepts. We expect this will motivate others to initiate research on all the aspects and develop comprehensive knowledge on this subject. We further assume, the knowledge itself will motivate the concerned authorities to develop a strategy to prevent elephant violence and understand the status and welfare of the mahouts.

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In addition to this, support and kind cooperation provided by all the Mahouts and all elephant owners and temple devaswoms also have been very much appreciated.

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Executive Summary

The captive elephant population of Kerala is exposed to varying work conditions and is the main draw to lure in crowds for temple festivals and other activities. As these animals are transported across locations, a substantial number die due to road accidents, mortality also occurs due to other causes. In addition to this, it's estimated that an average 17 elephant transactions take place in a month, and with each transfer of ownership, the elephants are expected to experience an unnatural environment and unnatural behaviors. Due to this and other factors, elephants have become unmanageable; incidents of physical harm caused by elephants on people (mahouts/ general public) have been reported. . This investigation is intended to reveal the problems and needs of mahouts to improve their life situations.

This investigation covers three aspects that are related to incidents of violence caused by elephants: The first exclusively covers the incidents of injury or mortality of keepers or elephants running amok. The second assesses the perception towards their profession among the 1st mahouts from regions where more festivals are held, i.e., Thrissur, Palakkad and Kottayam districts. The third aspect of the investigation assesses the risks associated with the profession of mahoutry. For both second and third aspects, 60 mahouts were selected randomly and pre-structured interview methods were adopted.

The deaths, injury to people, damage to public property and incidents of elephants running amok were analysed for their specific patterns. The mean age class of animal responsible for the incidents was 33.5 yrs and only 2.9% of the animals responsible were females. The pattern of occurrence of such incidents had two peaks: Jan-April and October – December, probably reflecting the usage of elephants for festivals during these months. When time slots of the incidents were considered, 10-11 a. m and 2-3 p.m. appeared to be very sensitive periods for the incidents to occur. This may have some relation with high temperature and humidity of the day.

As we classify incidents into death, injury, property damage, running amok and combination of each of these incidents, percentage of death dominates (22.6%) followed by the combination of injury and running amok (19.4%). Within each category of incident, a pattern of 65% of running amok, 62% of injury, 53% of property damage and 44% of human deaths can be observed. Elephants belonging to private owners were responsible for maximum (70%) incidents followed by temples (24%) and others (6%). The origin of the animals responsible for these incidents gave interesting insights. Elephants brought from the state of Bihar contributed more to such incidences. Locations of incidents were mostly in public places (68%) followed by festival grounds (21%). Elephants kept alone appeared to be responsible for 53% of such incidents. Animals kept along with other elephants also contributed to the incidents almost equally, suggesting both categories of animals are prone to such incidents.

Among the people killed, 68% were mahouts whereas injury occurrence was biased towards public (77%). The major cause for these incidents could be provocation (58%) and occurrence of musth (42%). Proximate reasons for such incidents could be as simple

as a motorbike irritating the animal, a fire-torch accidentally falling on the animal or mahout denying food or beating his animal.

In the aspect of motivation to become a mahout, 71.7% revealed they selected this profession due to their personal liking and 18.3% selected this as their traditional job and 10% said they joined this job because of lack of other jobs. Regarding perception of elephants, 48.4% consider it like a friend or son. It reveals their attachment to the animal. The investigation also show that 30% respondents believe in the concept of God Ganesha and 13.3% consider it to be an animal used for work. It may be noticed that 68.3% of the respondents family members are not favourable to this profession as it is a risky job.

Among 60 respondents, majority i.e., 91.7% were attacked/injured by the elephant. Among the mahouts who have been attacked by an elephant, 56.7% were attacked more than 3 times and remaining 35% were attacked 1-2 times. According to the nature of injuries sustained, 45% of the respondents got major injuries, 26.7% sustained minor and the remaining 20% of them got grievous injuries/ resulted in handicap. It has to be noticed that 63.4% of the attacked mahouts got financial help for the treatment.

The high occurrence of such incidents unique to the state, places a premium on human and animal lives, compromising the welfare of both. There are many legal rules for the welfare & management of captive elephants, but even with existence of labour laws, there is no protecting rule for mahout and their safety. The mahout-elephant conflict can be controlled by making the mahout's profession attractive, providing better remuneration, safety measures, risk coverage, cooperation from public and NGOs and other stakeholders.

Introduction

Captive elephants play an important role in Indian culture, religion (Bist, et al., 2002), and economy and even in politics. In India, Kerala is known as the “Elephant State” for its large population of captive elephants. A substantial number of these elephants die due to road accidents and other causes. In addition to this it's estimated that an average 17 elephant transactions take place in a month, and with each transfer of ownership, the elephants are expected to undergo change in their living environment and behaviours. Captive population, in this state is exposed to varying work conditions and used to draw in crowds for temple festivals and other activities. For every function the elephant has become an essential element. Due to this and other factors, elephants have become unmanageable and have resorted to killing or injuring their keepers or general public. Behind every elephant there is a mahout, who is closely associated with the animal to take care of it. Elephants are intelligent and the well-known adage “memory of an elephant” maybe reinforced by the events that an animal undergoes in its period of captivity. Taking care of such an animal is itself a strenuous job and also needs a lot of understanding and thinking on the part of a mahout. Mahoutry is a risky job. Mahouts are the first victims of revenge by the elephants.

In the past, the mahouts were respected and admired by the people, but today their position is weak. There are many agencies and associations for the care and support of the elephants but there is no one to take care of these human creatures who spend most of their life with their animals. This working class is facing many psycho-social problems. They don't have any regular social life. While closely connected with elephants, the mahout is risking his own life and even a mild attack from the elephant can be fatal. In Kerala, within the last quarter, 336 people were killed by domesticated elephants. It is pertinent to note that 268 of these were mahouts. It is clear that the mahouts are the first victims of elephant attacks, but the common tendency is to blame the mahouts, but not much attention has been given to their way of life, job risks, socio-economic conditions, family/married life, children's care and education, etc.

This study has been carried out to assess incidents of injury or mortality of elephant handlers or events of elephants running amok, and to find out the changing attitude and problems of mahouts, especially in Kerala. This study also tries to explore the risks involved in this profession and experiences of the mahouts attacked by elephants from Thrissur and Palakkad districts of Kerala.

Methods

This investigation covers three aspects connected with the negative interaction between elephant and humans: The first exclusively covers the incidents of injury or mortality of keepers or incidents of elephants running amok. This investigation was carried from January to December 2007. The second assesses the perception of mahouts towards their profession. This investigation was carried out in 2009 among the 1st mahouts from Thrissur, Palakkad and Kottayam districts where more festivals are held. The third aspect of the investigation assesses the risks associated with the profession of mahoutry, study was done in 2010. For both second and third aspects, 60 mahouts were selected randomly and pre-structured interview methods were adopted.

Mortality or injury of mahouts by elephants and elephants running amok

Incidents involving captive elephants' destruction of property, damage to lives and running amok was documented for the year 2006-2007 (January to December). Data on 31 elephants (30 males and 1 female) belonging to different ownership types was collected from various sources including the new items of the incidents appearing in major news papers (Figures 1a, b, c, and d):



a



b



c



d

Figures 1a, b c and d: Incidents of elephants attacking their mahouts as reported in various news papers

Each of the incidents was categorized into four self-explanatory types:

- Human deaths: handlers/ public
- Injury to handlers/ public
- Running amok
- Property damage

These incident types occurred singly or as a combination and have been documented. Details collected of events prior to such incidents include handler not feeding the elephant/ handler beating his elephant, instances of flame falling on the elephant, vehicles striking the elephant. Locations of temples and public places where festivals were conducted are given in the figures 2a, b, c and d.



a



b



c



d

Figures 2a,b,c and d: examples of locationstemples (a and b) and public places (c and d) where festivals were conducted

Assessing attitude of mahouts towards their profession and risk involved in mahoutry

These two investigations were carried out among the 1st mahouts from Thrissur, Palakkad and Kottayam districts where more festivals are held. In Kerala an average of three mahouts are assigned, the first mahout takes full responsibility for the animal and the second and third mahout are appointed to assist the first mahout. For both investigations, sixty 1st mahouts were selected randomly. Direct interview and observations of mahouts and home visits were the approaches used to understand various aspects of both these investigations. With a pre-structured data sheet, direct interview methods (Figure 2e) were carried out. In both the investigations, priorities were given to obtain the socio-economic profiles of the mahouts interviewed.



Figure 2e: direct interview methods to assess the attitude towards their profession

Results

Mortality or injury of mahouts by elephants and elephants running amok

Thirty-one elephants accounted for 34 incidents of uncontrollable and violent behavior (Figures 3a and b) between the years 2006-2007, with 3 elephants reported to have repeated such incidents with varying degree of violence/ uncontrolled behaviour.

a



b



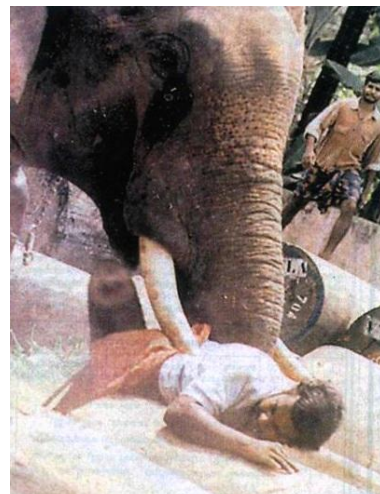
Figures 3a and b: incidents of violent behaviours by elephants noticed during survey period

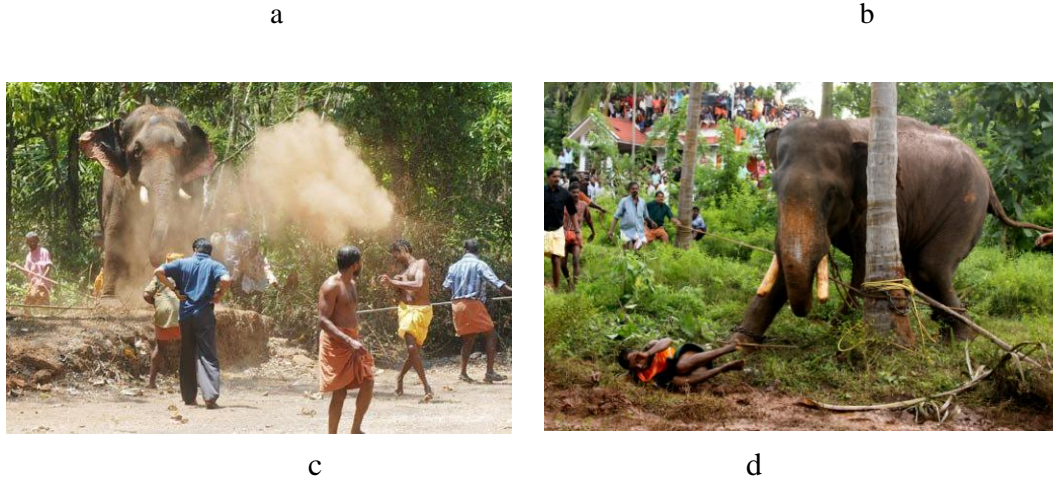
Age class responsible for the incidents

Of the 34 incidents, five elephants were reported to be in musth/ post musth phase. The mean age class of animal responsible for the incidents was 33.5 (S.E = 3.16) yrs, ranging from 7- 50 yrs and only 2.9% of the animals responsible were females.

Locations of occurrences

The location of occurrence of incidents suggest that most occurred in a public place (68%, n=34), followed by festival grounds (21%, n=34) and temples (12%, n=34). Public place includes temple/church/mosque, hotels, market, roads, hospitals etc. and festivals grounds are where the festivals are conducted.





Figures 4a, b, c and d: Occurrence of incidents in different locations

Month wise occurrences

The occurrence of violent incidents was plotted against months of the year (Figure 5), showing maximum occurrence in the period from December to April (71% of all incidents). Overall, the patterns of occurrence of such incidents can be brought under two peaks: January-April and October – December. Elephants in Kerala are used for festivals, in the timber industry and for tourism. The peak season for work in festivals/ tourism is from November to May, corresponding with the peak in occurrence of conflict incidents.

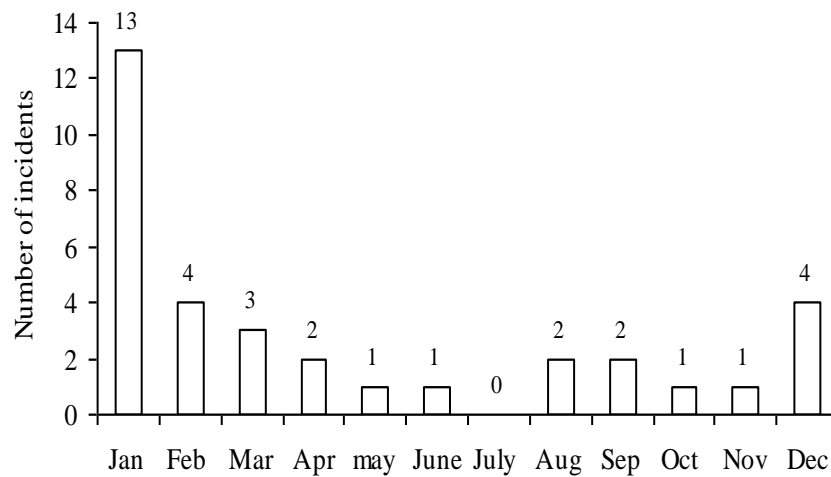


Figure 5: Occurrence of incidents across months/year

Time slots

Time of occurrence was recorded where available. Time was classified into early morning (4a.m. to 6a.m.), morning (7a.m. to 9a.m.), late morning (10a.m. to 12noon), Afternoon (1p.m. to 4p.m.), early evening (5p.m. to 7p.m.), evening (8p.m. to 10p.m.) and late evening (11p.m. to 1a.m.). Figure 6 gives the distribution of incidents across the

day. When all incidents were pooled together into morning/ afternoon/ evening, most incidents occurred in the morning (14), followed by afternoon (10) and evening (7).

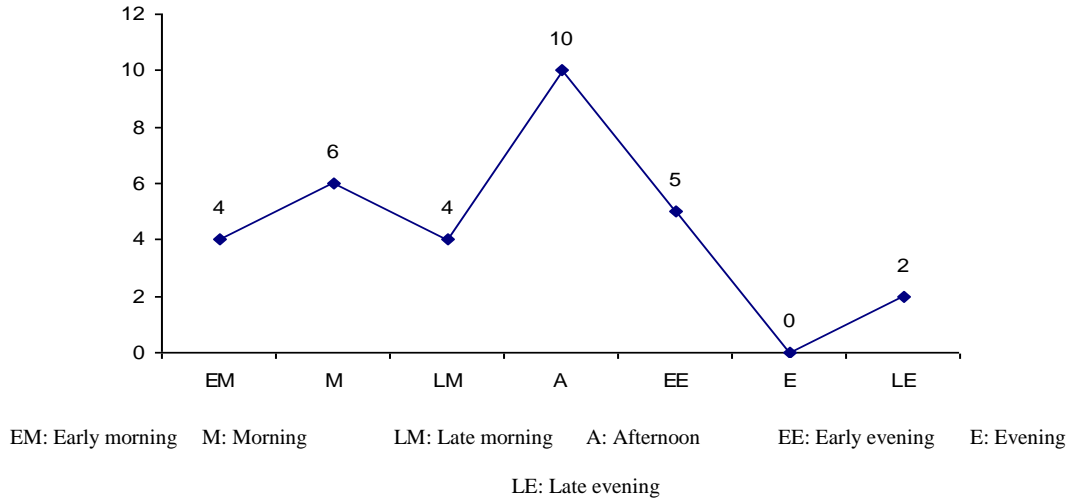


Figure 6: Occurrence of incidents across different times of the day

When time slots of the incidents were considered, 10-11 a.m. and 2-3p.m. appeared to be very sensitive periods for the incidents to occur. This may have some relation with high temperature and humidity of the day.

Classification of incidents

As we classify incidents into death, injury, property damage, running amok and combination of each of these, percentage of death dominates (22.6%) followed by the combination of injury and running amok (19.4%). Within each category of incident, a pattern of 65% of running amok, 62% of injury, 53% of property damage and 44% of human deaths can be observed.

Category of ownership responsible for the incidents

Elephants with private owners accounted for maximum occurrence of incidents (68%, N= 34) followed by temples (24%) and trusts/others (6%). Vanitha et al., (2009) reports higher incidence of man-slaughter among temple elephants of Tamil Nadu (their classification of private ownership included elephants managed by mutts and other religious institutions). Ownership of one elephant causing incident of human death + injury + running amok was not known. Table-1 gives the number of incidents attributed to different types of ownership. Incidents in which all the four types occurred were higher with private owners (3), followed by temples (1). Such incidents were reported four times.

Table 1: Incidents attributed to elephants with different owners

Ownership	Human death	Human injury	Property damage	Running amok
Private	10	14	12	13
Temple	3	4	5	6
Trust/others	1	2	1	2
Total	15	21	18	22

Considering the incidents of human death, twice the number of mahouts/handlers were killed as compared to the general public (handlers N= 10; public N= 5). Number of incidents of injury to the public (52) was higher when compared to handlers (16).

Animal responsible

When the management practice adopted in terms of whether the elephant was kept alone/ with others was considered, maximum incidents were caused by private elephants that were kept alone (Figure 7) followed by temple elephants kept with other elephants. For some elephants which caused such incidents, the management practice of keeping alone/ with others was not known. Such elephants under private ownership caused the same number of incidents as those which were kept alone. For temples and trusts, this number was low. A study by Easwaran (in press) shows that the ratio of owner to number of elephants was lowest for private owners implying incidence of single elephants with private owners.

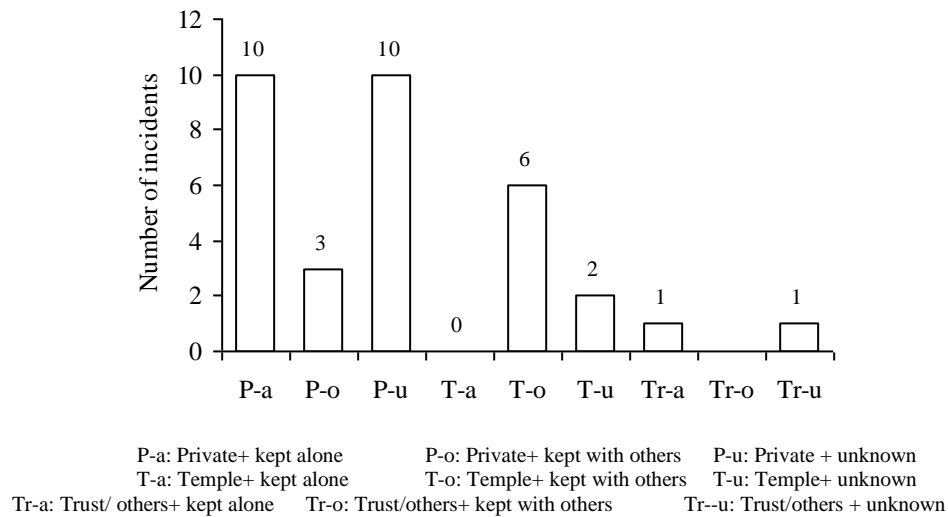


Figure 7: Management practice adopted and occurrence of incidents

Origin of the animals responsible for the incidents

The elephants reported to have exhibited violent/ uncontrolled behaviour were sourced from different states, including Kerala. Among the elephants reported to have engaged in such frenzied acts, most were sourced from Bihar (N=13), followed by Kerala and Assam

(N= 2), Andaman (1). From a survey of captive elephants (Varma, in press) the number of private or temple elephants known to have been purchased/brought from Bihar was (13), Kerala (18) and Assam (13). Easwaran's (in press) survey also states that most males were acquired from the two states of Kerala and Bihar, followed by Assam.

Causes of the incidents

Proximate reasons for such incidents could be as simple as a motorbike irritating the animal, a fire-torch accidentally falling on the animal or a mahout denying food or beating his animal.

Incidents reported in 2010

In 2010, from January to December 12 mahouts and 5 members of the public were killed by captive elephants. Majority of the violence occurred in public/festive places and the time of incidents were between 11.30 am and 4.30 pm. It was found that, most of the incidents occurred mainly due to the public provocation (crackers noise, holding tusk, blowing air horn, hitting through objects/vehicle etc.), elephants in musth and or anger appeared to contribute no incidents.

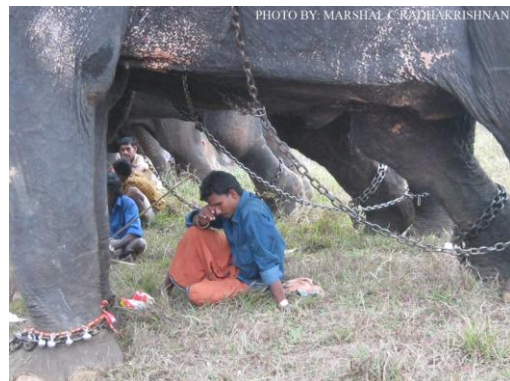
Mahouts' perception towards their profession and risk involved in mahoutry

Profile of respondents

The investigation revealed (Table 2) that 63.7% are in the age group of 40-50 years and 28.3 % are in the age-group of up to 30 years. In literacy status, 46.7% of the respondents have only lower primary education and only 10% are educated upto high school & above, remaining 20% are illiterate. On marital status, 76.7% were married; 10% of them are divorced (4) or widower (2); 13.3% are unmarried. Regarding the monthly income, 48.3% have an income of Rs.4, 000-6,000 and 25% earn below Rs.4, 000. Other 26.7% earn Rs.6, 000 or more and they are employed by the Devaswom or temple/trust. 63.3% of the respondents don't have any other source of income. Regarding the habit of savings, 86.7% were not having any savings. Figures 8a, b, c and d gives the pictorial representations of various profiles of mahouts working for different management regimes.



a



b



c



d

Figures 8a,b,c, and d: profiles of mahouts from different management regimes

Table 2: Profile of Mahouts

Sl.No	Characteristics	Percentage (*N=60)
1.	Age Group (in yrs.)	
	Up to 30	28.3
	31-40	15.0
	40-50	36.7
	Above 50	20.0
2.	Literacy Status	
	Illiterate	20.0
	Lower Primary	46.7
	Upper Primary	23.3
	High School & above	10.0
3.	Marital Status	
	Unmarried	13.3
	Married	76.7
	Divorced / Widower	10.0
4.	Monthly Income	
	< Rs.4000	25.0
	Rs.4001 - 6000	48.3
	Rs. 6000 +	26.7
5.	Other Source of income to family	
	Yes	36.7
	No	63.3
6.	Habit of Savings	
	Yes	13.3
	No	86.7

Motivation to become mahouts

In the aspect of motivation to opt for this profession, 71.7% revealed they selected this profession due to their personal liking, 18.3% selected it as this was their traditional job and 10% joined this job because of a lack of other jobs. Regarding their attitude towards

elephants, 48.4% considered it as a friend or son. About 30% of mahouts interviewed had the concept of elephant as God Ganesha and 13.3% believed it to be an animal used for work. It may be noticed that 68.3% of the respondent's family members did not favor this profession as it is a risky job. Out of 43 respondents (from total 60), who have sons, 31.7% were willing to educate them while 30% wished to opt for any other jobs for their sons (Table 3).

Only 10% were ready to make their son a mahout and 61.7% of them perceived a feeling of social stigma on account of being a mahout, 73.3% felt they were neglected by the society. The other important finding is 68.3% admitted that they were scared of elephants or had the fear of death in their mind. 85% of them felt they were over worked, especially during festival seasons. 78.3% were not satisfied with their present emoluments and 65% said that they felt insecure in their jobs because they could be terminated from service at any time. It has to be noticed that because of the present problems or mahoutry as a risky, less rewarding, stressful job, 56.7% thought of joining some other job. But because of the affection to their animal or love towards this profession they were not able to do it. Regarding the attitude towards this profession 68.4% perceived it to be a fatal or risky job, 18.3% did it for livelihood and 13.3% considered it an adventurous job. Table deals with some of the reflections and attitude of respondents towards their profession and their life situations.

Table 3: Attitude of mahouts towards their own profession and life situations

Sl. No	Characteristics	Percentage (*N=60)
1.	Motivation to become to mahout	
	Traditional/ Hereditary	18.3
	Personal liking	71.7
	Lack of any other job	10.0
2.	Concept about elephant	
	God Ganesha	30.0
	Like a Friend/ Son	48.4
	An animal used for work	13.3
	A social animal	8.3
3.	Are family members favourable to this profession	
	Yes	31.7
	No	68.3
4.	Future plans for their son	
	Mahout	10.0
	Education	31.7
	Any other job	30.0
	*N.A (Don't have son)	28.3
5.	Social Stigma being a mahout	
	Yes	38.3
	No	61.7
6.	Feel neglected by the society	
	Yes	73.3
	No	26.7
7.	Fear of Death / Scared of elephant	
	Yes	68.3
	No	31.7
8.	Feel over worked	

	Yes	85.0
	No	15.0
9.	Satisfied with present emoluments?	
	Yes	21.7
	No	78.3
10.	Insecurity of employment as Mahout	
	Yes	65.0
	No	35.0
11.	Thought of joining any other job	
	Yes	56.7
	No	43.3
12.	Attitude towards this profession	
	Adventurous	13.3
	Fatal & Risky	68.4
	Livelihood	18.3

Profile of respondents of job risk

It is clear that among 60 respondents (majority) i.e., 91.7% of them were attacked/injured by elephant/s (Figure 9) and only 8.3% were not attacked by an elephant. Among those attacked (91.7%), 56.7% were attacked more than 3 times and remaining 35% were attacked 1-2 times. According to the nature of injuries sustained, 45% of the respondents got major injuries, 26.7% sustained minor and the remaining 20% of them got grievous injuries/ resulted in handicap. Regarding the duration of the treatment 36.7% of the respondents had undergone 1 week - 3 weeks treatment, 33.3% had undergone period of 4 weeks & above and only 21.7% of the respondents had undergone treatment less than one week. It has to be noticed that 63.4% of the attacked mahouts got financial help for the treatment but remaining 28.3% of them did not get any financial help for their treatment expenses. The other interesting finding of the study was that out of 60 respondents, 71.7% of the respondents were scared of elephants or had the fear of death. Table 4 deals with risk factors, degree & nature of injuries, treatment details etc.



Figure 9: Mahout attacked by an elephant, assisted by his family

Table 4: Risk factors, degree and nature of injuries and treatment details

Sl. No	Characteristics	Percentage (%)* (*N=60)
1	No. of respondents who were attacked by the elephants	
	Attacked	91.7
	Not attacked at all	8.3
2	No. of times attacked by the elephant	
	<i>Not attacked at all</i>	8.3
	1-2 times	35
	3 + more times	56.7
3	Nature of injuries sustained	
	<i>Not attacked at all</i>	8.3
	Minor	26.7
	Major	45
	Grievous/ Resulted in handicap	20
4	Duration of treatment for injuries	
	<i>Not attacked at all</i>	8.3
	Less than one week	21.7
	1 week – 3 weeks	36.7
	4 weeks & above	33.3
5	Got adequate financial help for treatment	
	Not Applicable (<i>Not attacked at all</i>)	8.3
	Yes	63.4
	No	28.3
6	Fear of Death / Scared of elephant	
	Yes	71.7
	No	28.3

Discussion

The investigation reveals the following important aspects on occurrence of human death/ injury/ violent behaviour by elephants in Kerala:

1. Most such incidents occurred in public places, which are usually crowded with people, unregulated and noisy. Occurrence of incidents was equally distributed: single incident, i.e., human death/ injury/ property damage/ running amok occurred 10 times, two together (10), three incidents together (10). All four incidents occurred together four times.
2. Elephants with private owners accounted for the maximum number of incidents, both in number and kind. A survey found that the number of elephants maintained by private owners was more than all other management regimes (Eashwaran, in press).
3. Elephants maintained singly with private owners accounted for higher number of such incidents

4. Handlers appear to be at a greater risk from such violent acts due to greater number of deaths being reported
5. Peak working season coincides with maximum occurrence of such behaviour
6. The period from morning to afternoon (4a.m. to 4p.m.) accounted for most of such incidents; this could be a reflection of frequency of festivals/ functions being held during this time

Many factors could be responsible for the violent behaviour of elephants kept in captivity in Kerala. Working elephants belonging to private owners are made to walk an average distance of 39km (ranging from 15-125kms) or transported by vehicle for an average distance of 228kms (ranging from 45-1000kms), being made to participate in 30-100 programs per year/ season (Varma, et al., in press), remuneration per festival varying from Rs.2000 to Rs.3250. For temple elephants, work duration ranged from 6-12h, being made to attend 40-100 programs/ season (Varma, et al., in press). Exploitation of elephants during peak work season could be a major contributory factor toward expression of unruly behaviour by the elephants. In addition, absence of features integral to the biology of the elephant— their need to explore/ move across habitat in search food/ mates— is restricted or totally absent in their captive state (Varma, et al., in press).

The profile of mahouts in these districts shows older mahouts (40 to more than 50 years) opting for this profession as a form of family tradition, harboring feelings of being overworked and underpaid and having conflicting perception of their elephant, viz., considering it to be a valued relative, but retaining fear of the elephant. Mahouts' perception of being neglected by society as reported in this study was mentioned more than a decade ago by Lair (1997).

Among mahouts who were attacked by elephants, the trend visible was:

- More than 50% had been attacked more than three times
- Nearly 50% suffered “major” injuries
- 70% underwent treatment for periods between 1- more than 4 weeks
- Financial help was available for most (63%) after the attack
- What is not known, however, is the number of elephants each of these mahouts worked with following an attack.

Based on this information, the following scenario emerges:

- Mahouts consider themselves to be overworked; this could imply overworking of his elephant/s (Vanitha, et al., 2009)
- Despite working in a self-perceived under-paid and overworked job, mahouts have to perform their duties vis-à-vis their elephants, leading to potential deficiencies in care— for himself and/or his elephant/s
- Elephants are subjected to diverse un-natural environments while working, in the form of large crowds, noise, unfamiliar environment, sudden/unintentional changes in surroundings
- Attack by elephants resulting in injury/ death of people, running amok by elephants

- Among those killed by elephants most were mahouts, implying their vulnerability to attacks
- Most mahouts who were attacked had undergone such incidents more than once
- Lack of alternate sources of employment for mahouts and duration of treatment following an attack by his elephant has the potential to lower the income earning capacity of his family
- An element of fear of his elephant was prevalent in most mahouts, implying lack of “trust” between mahout and elephant; this may have consequences on the way elephant is handled and the way the elephant behaves with his mahout

There are many rules for the welfare & management of captive elephants but there is a lack of the same for mahouts and their safety. Despite the existence of an insurance scheme initiated by the government, lack of awareness of such schemes as well as the lack of awareness of the benefits of making use of such schemes is prevalent among the mahouts. In Kerala, we see many cases where the mahout’s family is left in total penury following his death. It is high time to make them aware of the need for savings & benefits of insurance.

Elephants should get enough rest, food, water, care and proper musth care management. It is the responsibility of the elephant owner, mahout, elephant agents, festival authorities, forest departmental authorities, police and the public to provide a conducive environment to the elephant kept in captivity in Kerala. This will help to reduce the stress level and aggressive nature of the pachyderm to some extent. It has to be kept in mind that elephants are basically wild animals with unpredictable behaviour and cannot be completely domesticated. One of the most important responsibilities is to educate the public about elephant behavior and peculiarities, to raise awareness about the elephants and erase misconceptions about this animal

The man-elephant conflict cannot be controlled merely through scientific training of mahouts. Mahouts should get all safety measures, risk coverage, cooperation from the public and governments. In addition to all, detailed studies or investigations are needed on the ownership history of each elephant exhibiting such behaviour, management practice adopted for the elephants, details of work schedule, nature of mahout (handler)-elephant relationship—whether it is based on punishment only or other methods used by handler to control his elephant, if such incidents have to be curtailed.

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

Asian Nature Conservation Foundation (ANCF) is a non-profit public charitable trust set up to meet the need for an informed decision-making framework to stem the rapidly declining natural landscape and biological diversity of India and other countries of tropical Asia. The Foundation undertakes activities independently and in coordination with governmental agencies, research institutions, conservation NGOs and individuals from India and abroad, in all matters relating to the 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 foray.

Elephant Welfare Association (EWA): is a not-for-profit charity organization, based at Thrissur, Kerala. Since 13 years, under the expert guidance eminent elephantologists, Dr.K.C.Panicker, Dr. J.V. Cheeran, and Dr. K. Radhakrishnan, the organization is working towards ensuring welfare of captive elephants in Kerala, welfare of handlers, providing veterinary and health care and crisis management in situations involving elephants. EWA works with various government and non-government agencies to ensure elephant well-being. It undertakes capacity development programmes for owners, handlers and the public. EWA also provides literary information on elephants and its associated features, to the public, through its library which holds a collection of books, periodicals and scientific materials.

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

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Elephant handlers (mahouts and their assistances) form a significant part of captive elephant systems. Their professional knowledge and socio-economic status have an effect not only on their own welfare but may also affect the way elephants are handled. Captive population, in Kerala is exposed to varying work conditions used to draw in crowds for temple festivals and other activities. Behind every elephant there is a mahout, who is closely associated with it to take care of it. Elephant is an intelligent and unpredictable animal. Taking care of them such an animal is itself a strenuous job and also needs a lot of understanding and thinking on the part of a mahout. However, due to various factors, elephants have become unmanageable and have resorted to kill or injure their keepers. This investigation covers three aspects that connected with the incidents of injury or mortality of keepers, damage to public property and running amok by elephants. The first exclusively covers the incidents of injury or mortality of keepers or elephant running amok. The second assess the perception of mahouts towards their profession among the 1st mahouts from Thrissur, Palakkad and Kottayam districts where more festivals are held.

