PROFILE OF ELEPHANT KEEPERS AND OWNERS OF THRISSUR AND PALAKKAD DISTRICTS

By

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THESIS

Submitted in partial fulfilment of the requirement for the degree of

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DECLARATION

I hereby declare that the thesis entitled **"PROFILE OF ELEPHANT KEEPERS AND OWNERS OF THRISSUR AND PALAKKAD DISTRICTS"** is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

Mannuthy
20.12.2001

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CERTIFICATE

Certified that the thesis, entitled **"PROFILE OF ELEPHANT KEEPERS AND OWNERS OF THRISSUR AND PALAKKAD DISTRICTS"** is a record of research work done independently by **Sri. Rajeev, T.S.** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, associateship or fellowship to him.

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" TO SERVE BETTER THE LORD "

IN LOVING MEMORY OF...

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RAJEEV, T.S.

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Introduction

1. INTRODUCTION

The elephant forms an integral part of the cultural life of Kerala. The elephant is Lord Ganapathi to Hindus and hence its importance in temple rituals and festivals. However, in Kerala caporonised elephants have become an important item even in Christian and Muslim festivals. Its presence is therefore more or less universal.

In Kerala there are approximately 600 captive elephants as known from the records kept by the elephant welfare association of Thrissur, the only one of its kind in Kerala. There has not been an official survey to count the number of captive elephants in the recent past. These captive elephants are mainly used for two types of work viz., rituals and festivals in temples, churches and mosques, and draught purpose in timber mills and forests. Usually the captive elephants are owned by the Forest Department, Devaswoms (temple administrations) and individuals.

Elephants are controlled and managed by two mahouts whom are designated as first and second mahouts (elephant keepers). Sometimes, a third mahout would also be there. Third mahout is very rarely seen only in Kerala and not in any other states. This hierarchy is according to the experience and amount of control that the mahouts have on the elephant. Nature of work, pay and allowances etc. depend upon this hierarchy. The second mahout as

well as the third mahout if any are there only to assist the first mahout in carrying out the daily chores associated with elephant keeping.

Unlike livestock owners, elephant owners themselves seldom look after their elephants except in very few cases where owners also act as mahouts. The elephant owner is the person, who takes decision on the various works including renting for festivals and other purposes. He also takes decisions regarding purchasing of feeding materials, spending for medicines, treatment etc. In the case of institutional owners such as Devaswoms, a livestock manager usually will be acting as the owner and taking decisions regarding management. Comparatively, in Kerala individual owners are more than institutional owners, whereas the latter are more in other states.

In Kerala, the number of festivals or livelihood activities involving elephants are comparatively more in the central districts such as, Thrissur, Palakkad and Ernakulam. The captive elephant population hence tend to be more here than other parts of Kerala. Though the captive elephant is owned by people and looked after by the mahouts and is the basis of livelihood for all, like livestock keeping, yet the former is only considered as a wild animal due to the rigorous wild life protection policies.

Elephant keeping is a highly risky job as compared to livestock keeping. Ignorance of proper management could entail heavy loss and untold misery. Instances of the captive elephants becoming violent and causing

damage to public property and killing the mahouts, owners and even people are not uncommon. At the same time instances of meting out inhumane treatment to them or torturing them are also common.

It is absolutely imperative that elephant keepers and owners know their elephant and its management. It is also essential that the first mahouts who are primarily responsible for the daily chores should be adopting the recommended scientific practices with the proper knowledge of the owners.

In view of the above facts a study was conducted among the elephant owners and mahouts with the following objectives.

1. To assess the profile of elephant keepers.
2. To assess the knowledge level of elephant keepers about scientific management of elephants
3. To study the extent of adoption of scientific management practices in elephant keeping.

Review of Literature

2. REVIEW OF LITERATURE

Domesticated elephants are not considered as livestock, but only as wild animal for wildlife protection policies. Considering the fact that for both domesticated elephants and livestock scientific management practices are important and that there has been only fewer attempts to study elephant management, a review of those related studies pertaining to livestock species has been incorporated.

The review is presented under the following headings.

1. General aspects of mahoutship and elephant ownership
2. Legal recommendations and rules regarding mahoutship and ownership of elephants.
3. Knowledge studies pertaining to livestock species
4. Adoption studies pertaining to livestock species
5. Relationship between independent variables and adoption of scientific management practices.

1. General aspects of mahoutship and elephant ownership

Joy (1990) reported that the elephants owned by private owners tend to be more dangerous than elephants owned by departments because in latter case, the owners or keepers are more responsible than the former.

Joy (1990) suggested that the lack of scientific knowledge of elephants might have led to the present day conflict between mahouts and elephants.

Lair (1997) distinguished three strata of elephant keepers as mahout-owners (people who own and ride elephants), non-mahout owners (people who own but not ride elephants) and hired mahouts (people who only ride elephants) on economic perspective than social perspective.

Lair (1997) suggested that poor mahoutship is the most frightening problem faced by the domesticated elephants in Thailand, India and Sri Lanka.

Ponnappan (1998) opined that most of the injuries to elephants are caused due to ignorance and uncontrolled use of restraining devices by the mahout.

Panicker (1998) reported that imparting of proper training to mahouts in scientific elephant management and timely refreshing of their knowledge can lead to decreased cruelty and discomfort to elephants.

Nibha (1998) suggested that elephant owner's low knowledge of scientific elephant management led to over exploitation of elephants and consequent problems to them.

Giridas (1998) opined that the elephants face cruelty from the mahouts and owners because of their low knowledge of scientific elephant management.

Jacob and Trevor (2000) recommended that proper training should be given to elephant keepers and owners for ensuring humane treatment to elephants and for training the captive elephants.

Girinathan (2000) suggested that the mahout should spend a lot of time with the elephant to develop a bond of confidence between the animal and mahout himself.

Damodaran (2000) opined that the elephant mahouts should have prompt knowledge in harness and control practices acquired from the elder or first mahouts and should be provided with extra guidance and training.

2. Legal recommendations and rules regarding mahoutship and ownership of elephants

Jacob (2000) reported that the Sections 40, 41, 42, 43, 44, 45, 46, 47, 48 and 49 of the Wildlife Protection Act 1972 and prevention of cruelty act of 1960 prescribe many regulations for keeping the animals in captivity and using the provisions under Section 64 of Wildlife Protection Act 1972, the Kerala Government laid out the rules regarding captive elephant management. Some of the relevant rules are as follows:

- All the mahouts in service and newly recruited shall undergo inservice/preservice training by Forest Department and obtain licence.
- A mahout shall not handle the elephant under intoxication.
- The Chief Wildlife Warden/authorized officer will issue the licence based on his performance in the training.
- The first mahout of an elephant should have an experience of three years as second mahout and two years of experience as third mahout.
- The licence should be renewed every two years.
- The mahout shall give atleast one month notice to the owner in writing under proper acknowledgement before leaving an elephant failing to which, his licence will be suspended to minimum of six months.

Similarly, the rules insist the proper housing, ownership, care of elephant, feeding practices, work load, timber hauling, acts of cruelty to elephants, norms and standard of transportation, retirement of elephants, care of old elephants, record keeping, breeding policy, cutting tusks and remuneration to mahouts.

3. Knowledge studies pertaining to livestock species

Gill and Singh (1977) found that most of the farmers had low knowledge of breeding, feeding, housing and animal health. These farmer's knowledge of marketing and management was nevertheless medium.

Nataraju and Channegowda (1986) reported that majority of dairymen had medium knowledge while 19.4 per cent had high and 13.3 per cent had low knowledge of dairy farming.

Alexander and Kumaran (1992) suggested that the overall knowledge of respondents in three of the five studied domains of agriculture and animal husbandry were low.

Anil (1992) reported that out of the respondents studied, majority of men and women had medium knowledge of dairy management.

Rangnekar *et al.* (1994) reported that the majority of women under study were aware of the need for better quality feed in order to achieve high

production and in general majority of respondents had medium knowledge of Animal Husbandry.

Shreeshailaja and Veerabhadraiah (1994) reported that almost equal percentage of farm women had high, medium and low knowledge of improved dairy farming practices.

Nisha and Subramanian (1997) reported that 78 per cent of the respondent had medium to high knowledge of dairy farming and the rest had only low knowledge of dairy farming.

Sheela and Sundaraswamy (1999) reported that majority of the respondents (60 per cent) had medium knowledge of improved dairy husbandry practices.

4. Adoption studies pertaining to livestock species

Jothiraj (1974) reported that 11 per cent of the respondents were adopting all the four selected practices, 18 per cent three practices, 61 per cent two practices, 8 per cent atleast one practice, while two per cent of the respondents were not adopting even a single recommended practice pertaining to dairy husbandry.

Sohi and Kherde (1980) reported that out of 120 respondents, 21.67 per cent were low adopters, 53.33 per cent were medium adopters and 25 per cent were high adopters of dairy husbandry practices.

Nair (1980) found that 49, 33 and 16 per cent of respondents belonged to high, medium and low adopter categories respectively regarding dairy husbandry.

Kakoty and Sharma (1986) found that regarding management practices of cattle, 94 per cent and 83 per cent of the total respondents adopted improved disease control and breeding practices respectively while only 27 per cent and 15 per cent of respondents adopted feeding and management practices respectively.

Shreeshailaja and Veerabhadraiah (1994) reported that regarding improved dairy practices thirty five per cent of the women were medium level adopters followed by low level and high level adopters in that order.

5. Relationship between independent variables and adoption of scientific management practices

Jothiraj (1974) found that gross annual income of the respondents had no relationship with the adoption of artificial breeding practice, and preventive vaccination, but was influencing the use of commercial cattle feeds and regular breeding.

Saini *et al.* (1977) observed that the level of adoption of dairy husbandry practices were not influenced by the educational level of the dairymen.

Singh and Dubey (1978) observed no relationship between land holding and adoption of an improved husbandry practice.

Subhadra (1979) noted that dairy farmer's gross income was not influencing the adoption of selected husbandry practices. The adoption of Artificial breeding, deworming of calf and timely veterinary aid were the only practices found to have significance, among the practices she studied.

Singh *et al.* (1979) reported that among adopters of Artificial Insemination, 68.33 per cent had high knowledge of AI while the remaining 31.67 per cent had medium knowledge. None of the adopters had low knowledge of AI.

Subhadra (1979) noted that education was not influencing the adoption of animal husbandry practices.

Subhadra (1979) noted that the size of land held by farmers had no influence on their adoption behaviour.

Subhadra (1979) found that no significant relationship existed between farming experience and adoption of dairy husbandry practices.

Tyagi and Sohal (1984) reported that knowledge of technology was significantly related to adoption and the increase in knowledge of dairy innovations led to higher adoption of these innovations.

Ramkumar (1987) revealed that age and education had no significant association with the extent of adoption of improved dairy practices.

Raju (1992) reported that the level of knowledge had significant influence on adoption of recommended practices by dairy farmers.

Sharma and Riyazuddin (1993) reported that technical guidance and input provided to the goat breeders led to increased knowledge and adoption of scientific practices.

Tripathi *et al.* (1995) reported that adoption of all the dairy farm technologies were highly associated with knowledge of these technologies.

Sheela and Sundaraswamy (1999) reported that age and education of the respondents were not significantly associated with the knowledge of dairy management practices.

Anil *et al.* (2000) reported that experience in dairying, had positive influence on adoption of improved dairy management practices.

Methodology

3. METHODOLOGY

Methods of research followed are presented in this chapter under the following headings.

3.1 Sampling design

Thrissur and Palakkad, two adjoining districts of Kerala, were purposively selected for the study since captive elephants abound in these districts. For the purpose of sampling, several units consisting of the owner, first and second mahouts of an elephant were identified and listed for both Thrissur and Palakkad districts. Accordingly 69 and 41 units respectively were identified in Thrissur and Palakkad districts. Out of these, applying proportionate random sampling procedure, 31 and 19 units respectively from Thrissur and Palakkad districts were selected for the study. This sample, however comprised of 6 and 4 units respectively drawn from temples of Thrissur and Palakkad. Thus the sample of the study consisted of 50 elephant owners and out of which, 10 were devaswoms, 50 first mahouts and 50 second mahouts. In the case of individuals or institutions (devaswoms) owning five or

more elephants only one unit from among them was purposively included. In order to prepare the list of units, available record on this (Anonymous, 1999) was made use of along with field enquiries.

3.2 Selection of variables and their measurement

3.2.1 Independent variables

3.2.1.1 Socio-personal

X1	Age	Structured schedule
X2	Sex	-do-
X3	Caste	-do-
X4	Experience	-do-
X5	Marital status	-do-
X6	Literacy	-do-
X7	Education	-do-
X8	Occupation of father	-do-
X9	Motivation	-do-
X10	Occupational hazards	-do-
X11	Concept of elephant	-do-
X12	Training	-do-
X13	Religion	-do-
X14	Degree of injury	-do-
X15	Amount of rest to the elephant	-do-

3.2.1.2 Socio-economic

		Structured schedule
X16	Land holding	-do-
X17	Income from job	-do-
X18	Income from other sources	-do-

3.2.2 Dependent variables

3.2.2.1 Knowledge of elephant management practices

Y1	Elephant owner's knowledge	Arbitrary knowledge test
Y2	First mahouts knowledge	-do-
Y3	Second mahouts knowledge	-do-

3.2.2.2 Adoption of elephant management practices

Y4	Adoption of elephant management practices by first mahouts	Scale developed

3.2.2.3 Training needs

Method by Gill and Sandhu (1981)

Y5 Training need of elephant owners
Y6 Training need of first mahouts
Y7 Training need of second mahouts

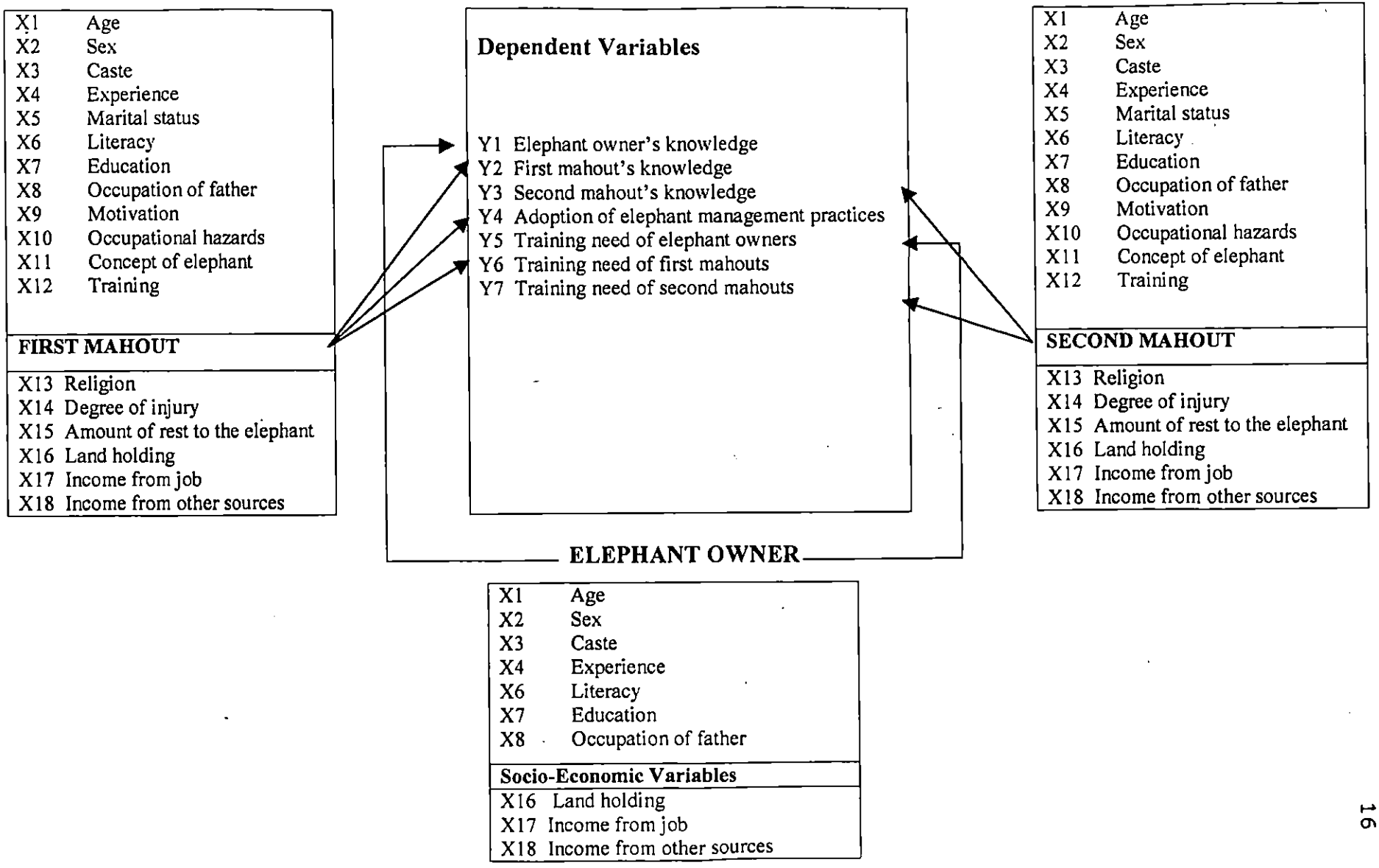
Operationalization of variables

X1 Age

Age indicated the chromological age of the elephant owners and mahouts at the time of interview.

Categories	
Young	<30 years
Middle	30 to 50 years
Old	>50 years

CONCEPTUAL MODEL OF THE STUDY



X2 Sex

It meant whether elephant owners and mahouts were male or female.

Categories	Scores
Male	1
Female	0

X3 Caste

It denoted the different communities to which elephant owners and mahouts belonged to, as per the caste system prevailing in the state. Caste-wise categories as observed in the study are reported.

X4 Experience

It meant the number of years elephant owners and mahouts have been owning elephant or on the job of mahouts, whatever is applicable.

Categories	
High	> mean + S.D
Medium	Mean – S.D to mean + S.D.
Low	< mean – S.D.

X5 *Marital status*

It meant whether elephant owners and mahouts were married or not.

Categories	Scores
Married	1
Bachelor	2

X6 Literacy

It meant whether elephant owners and mahouts could read and write.

Categories	Scores
Literate	1
Illiterate	2

X7 Education

It indicated the level of formal education that elephant owners and mahouts had acquired.

Categories	Scores
Lower primary	1
Upper primary	2
High School	3
Pre-Degree	4
Degree	5

X8 Occupation of father

It meant the major occupation of mahout's father

Categorization	Scores
Labourer	
Business	
Service	
Farming	
Elephant keeping	
Mahoutship	

X9 Motivation

It indicated what factor influenced the mahouts to take to mahoutship and those individual owners to keep elephants.

Categories

1. Mahouts personal interest
   Successor to father
2. Individual owners
   Successor to father
   Personal interest
   To work in one's own timber mills

X10 Occupational hazards

It indicated the degree of injury inflicted on mahouts by the elephant while handling it.

Categorization
Injured
Not injured

X11 Concept of elephant

It meant as what owners and mahouts see or consider their elephants

Categorization
Lord Ganapathi

Friend

X12 Training

It denoted whether the respondents attended any formal learning situation regarding elephant management and control.

Categorization	Scores
Training attended	1
Training not attended	2

X13 Religion

It meant to what religion the elephant owners and mahouts belonged to.

Categorization
Hindu
Christian
Muslim

X 14 Degree of injury

It meant the severity of injury inflicted on mahouts by the elephants.

Categorization
Mild
Severe

X15 Amount of rest to the elephant

It meant the mahouts perception of amount of rest that their elephant had.

Categorization
Adequate
Some what adequate
Inadequate

3.2.1.2 Socio-economic variables

X16 Landholding

It indicated the area of cultivable land including homestead possessed by individual elephant owners and mahouts during the time of study, expressed in cents.

X17 Income from job

It indicated the amount, in rupees, earned out of (a single) elephant ownership or mahoutship, annually and as revealed by the respondents themselves.

X18 Income from other sources

It indicated the amount in rupees earned out of other sources elephant ownership or mahoutship, annually and as revealed by the respondents themselves.

3.2.2 Knowledge of elephant management practices

To measure owners' and mahouts' knowledge of elephant management, arbitrary knowledge tests were developed. However, the content validity of the items were assured by incorporating items representing the universe of content pertaining to the knowledge domain. For this, expert opinion was sought and authentic literature on elephant management was referred to. Experts included specialists in elephant management and veterinary medicine, specialists in ayurveda system of elephant medicine etc. Literature referred to included the package of practice recommendations pertaining to elephant management and medicine published by the Kerala Agricultural University and a few authentic books on the subject. In all items under three domains viz., disease management, harness and general management were originally collected to prepare knowledge tests for owners and mahouts respectively. These items were later subjected to relevancy rating. Relevancy rating was done by a panel of 10 judges comprising of specialists in elephant management and diseases both from modern as well as ayurveda systems. Judges were asked to rate the relevancy of the items in a three point continuum viz., separately for owners and mahouts. The three point continuum viz., relevant, somewhat relevant and not relevant carried weightages of 3, 2 and 1 respectively. The total score obtained for each item was calculated and it was converted to percentage score by applying the formula.

$$\text{Percentage score} = \frac{\text{Total score obtained}}{\text{Maximum obtainable score}} \times 100$$

The mean percentage scores separately for three domains viz., disease management, harness and general management were then calculated. The items having a percentage score above this mean percentage score were included as test items. The final knowledge test to measure elephant owners' and mahouts' knowledge of elephant management had 111 and 135 items respectively. Both knowledge tests comprised of three domains viz., disease management, harness and general management and the number of items included were respectively 43, 18 and 50. In the case of knowledge test to measure elephant owners' knowledge and the corresponding number of items in the knowledge test to measure mahout's knowledge were 25, 36 and 74. On the basis of scores obtained and applying Delineus hodger cumulative $\sqrt{F}$ method, the owners and mahouts were categorised into those having low, medium and high knowledge.

3.2.2.2 Adoption of elephant management practices

To measure the adoption of elephant management practices by the mahouts a scale was developed. For this, 74 practices were initially collected after consulting subject matter specialists and referring to authentic literature. Each of these practices was written as statements. These statements were grouped under three domains viz., general management, disease management and harness, and numbering 19, 30 and 25 respectively. After thorough editing

these were referred to 10 selected judges who were subject matter specialists to judge the relevancy of these practices in measuring the adoption of elephant management practices by mahouts, in a Likert's three point continuum viz., very important, important and not so important with weightages of 3, 2 and 1 respectively.

Now, the scores obtained on the basis of rating by judges about a practice were added to obtain the total score of that practice. The total score of each practice was divided by 10, the number of judges, to arrive at the mean score. Later, mean of mean scores of all 74 practices were calculated.

The mean of mean scores was taken as cut off point and all statements having mean scores greater than this cut off point were included in the final scale. The final scale consisted of 64 statements and the three domains viz., general management, disease management and harness comprised of 19, 20 and 25 statements respectively. The responses to the statements were obtained from the first mahouts.

Respondents were categorised applying Delenieus Hodges method into high, medium and low level adopters based on the total score over all the three domains studied viz., each respondent obtained.

To know which domain among the three domains studied of elephant management was adopted the most and to rank them accordingly. Adoption Quotient of all three domains were worked out applying the following formula.

$$\text{Adoption Quotient} = \frac{\text{Number of practices adopted} \times 100}{\text{Total number of practices} \times \text{Total number of respondents}}$$

Adoption by first mahouts were only considered in the present study.

3.2.2.3 Training need score

The training needs of the respondents were derived using the method suggested by Gill and Sandhu (1981).

$$\text{Training need} = 1 - \text{Average knowledge score}$$

$$\text{Average knowledge score} = \frac{\text{Total knowledge score}}{\text{No. of questions} \times \text{No. of respondents}}$$

3.3 Data collection

Commensurate with objectives of the study an interview schedule was prepared (Appendix 1). The sample respondents viz., the elephant owners and mahouts were interviewed individually during the months of April, May, June and July 2001. This period was selected since the elephants come to 'musth' during these months and would be confined rendering the mahouts available, most of the time at the site of confinement, for interview. However, elephant owners were interviewed either at their houses or offices.

3.4 Statistical analysis

The following arithmatics and statistics were used to analyse the data.

1. Frequency
2. Percentage
3. Mean
4. Standard deviation
5. Correlation
6. 'Z' test
7. Delenious Hodges cumulative $\sqrt{F}$ method
8. Hotellings' T-squared test and
9. Adoption Quotient

Results

4. RESULTS

The results of the study is discussed in this chapter under various headings.

1. Socio-personal profile of the respondents

1.1 Age of elephant owners and mahouts

Table 1. Distribution of elephant owners and mahouts according to their age

n = 150

Sl. No.	Age group	Owners (f)	First mahouts (f)	Second mahouts (f)
1	Young (<30 years)	1 (2)	13 (26)	20 (40)
2	Middle (30-50 years)	27 (54)	36 (72)	29 (58)
3	Old (>50 years)	22 (44)	1 (2)	1 (2)
	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

The data in Table 1 revealed that 54 per cent of elephant owners belonged to middle age group while 44 per cent and 2 per cent belonged to old and young age groups respectively. Seventy two per cent of the first mahouts belonged to middle age group while twenty six per cent and two per cent belonged to young and old age groups respectively. In the case of second mahouts, 58 per cent, 40 per cent and 2 per cent belonged to middle, young and old age groups respectively.

1.2 Education of elephant owners and mahouts

Table 2. Distribution of elephant owners and mahouts according to their education

n = 150

Sl. No.	Education	Owners (f)	First mahouts (f)	Second mahouts (f)
1	Lower primary	1 (2)	33 (66)	27 (54)
2	Upper primary	3 (6)	14 (28)	16 (32)
3	High school	20 (40)	3 (6)	7 (14)
4	Pre-degree	10 (20)	Nil	Nil
5	Degree or diploma	16 (32)	Nil	Nil
6	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Data in Table 2 indicated that the majority of the owners (40%) were having high school education. Degree holders were 32 per cent. Twenty per cent of owners underwent pre-degree education. Six per cent of owners had upper primary education and another 2 per cent of them had lower primary education.

Majority of the first mahouts (66%) were having lower primary education. Twenty eight per cent had upper primary education and 6 per cent had high school education. A majority of the second mahouts (54%) were having lower primary education and 32 per cent were having upper primary education. Those having high school education among second mahouts were 14 per cent.

1.3 Literacy of elephant owners and mahouts

Table 3. Distribution of elephant owners and mahouts according to their literacy

n = 150

Sl. No.	Category	Owners (f)	First mahouts (f)	Second mahouts (f)
1	Literate	50 (100)	35 (70)	37 (74)
2	Illiterate	0 (0)	15 (30)	13 (26)
3	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 3 revealed that all the owners (100%) were literate. Majority of the first (70%) and second mahouts (74%) were also literate. Illiterates among first and second mahouts were 30 per cent and 26 per cent respectively.

1.4 Religion of elephant owners and mahouts

Table 4. Distribution of elephant owners and mahouts according to their religions

n = 150

Sl. No.	Religions	Owners (f)	First mahouts (f)	Second mahouts (f)
1	Hindu	36 (72)	47 (94)	45 (90)
2	Christian	12 (24)	0 (0)	3 (6)
3	Muslim	2 (4)	3 (6)	2 (4)
4	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 4 showed that majority of the owners (72%), first mahouts (94%) and second mahouts (90%) were Hindus. Twenty four per cent of owners were Christians while 4 per cent were muslims. Six per cent of the first mahouts were muslims and an equal percentage of the second mahouts were Christians. Four per cent of second mahouts were muslims.

1.5 Castes of Hindu elephant owners and mahouts

Table 5. Distribution of Hindu elephant owners and mahouts according to their castes

Sl. No.	Caste	Owners (n = 36) (f)	First mahouts (n=47) (f)	Second mahouts (n=45) (f)
1	Namboodiri	9 (25)	--	--
2	Nair	15 (42)	9 (18)	8 (18)
3	Ezhava	9 (25)	15 (32)	17 (38)
4	Vaidya	1 (2)	1 (2)	--
5	Moothan	2 (6)	1 (2)	--
6	Goldsmith	--	2 (5)	--
7	Thandan	--	--	2 (4)
8	Veerasaiva	--		1 (2)
9	Scheduled caste	--	19 (40)	17 (38)
	Total	36 (100)	47 (100)	45 (100)

Figures in parenthesis indicate percentage

Data in Table 5 revealed that 42 per cent of owners belonged to Nair caste followed by Namboodiri (25%), Ezhava (25%), Moothan (6%) and Vaidya (2%).

Forty per cent of first mahouts were belonging to scheduled caste followed by Ezhava (32%), Nair (18%), Goldsmith (5%) and 2 per cent each of Moothan and Vaidya.

Among second mahouts thirty eight per cent each were from Scheduled Caste and Ezhava followed by Nair (18%), Thandan (4%) and Veerasaiva (2%).

1.6 Training attended by the elephant owners and mahouts

Table 6. Distribution of elephant owners and mahouts according to the training attended by them

n = 150

Sl. No.	Category	Owners f	First mahouts f	Second mahouts f
1	Training attended	0 (0)	1 (2)	3 (6)
2	Training not attended	50 (100)	49 (98)	47 (94)
3	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 6 revealed that none of the owners received any training regarding elephant management. Two per cent of the first mahouts and 6 per cent of the second mahouts received training. Those who did not attend to training among first and second mahouts were 98 and 94 per cent respectively.

1.7 Experience of elephant owners and mahouts

Table 7. Distribution of elephant owners and mahouts according to their experience

n = 150

Sl. No.	Experience	Owners (f)	First mahouts (f)	Second mahouts (f)
1	Low (≤5 years)	12 (24)	8 (16)	7 (14)
2	Medium (6-23 years)	31 (62)	32 (64)	37 (74)
3	High (≥24 years)	7 (14)	10 (20)	6 (12)
4	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Data in Table 7 showed that a majority of owners (62%) were having medium experience in elephant keeping. Fourteen per cent were highly experienced and 24 per cent were lowly experienced.

In the case of first mahouts, majority of them (64%) were possessing medium experience while 20 per cent and 16 per cent respectively were highly and lowly experienced.

Most of the second mahouts (74%) were having medium level of experience. Fourteen per cent were lowly experienced while 12 per cent were highly experienced.

1.8 Occupation of father of elephant owners and mahouts

Table 8. Distribution of elephant owners and mahouts according to the occupation of their father

n = 150

Sl. No.	Occupation of father	Owners f	First mahouts f	Second mahouts f
1	Employment on daily wages	0 (0)	21 (42)	27 (54)
2	Farming	12 (24)	7 (14)	5 (10)
3	Business	9 (18)	4 (8)	4 (8)
4	Govt. job	5 (10)	2 (4)	0
5	Temple job	5 (10)	0	0
6	Teacher	4 (8)	0	0
7	Vaidya	4 (8)	1 (2)	0
8	Mahout	0	9 (18)	3 (6)
9	General worker	0	2 (4)	8 (16)
10	Timber mill owner	11 (22)		
11	Job in mills	Nil	1(2)	Nil
12	Others	Nil	3 (6)	3 (6)
	Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 8 revealed that the occupation of 24 per cent of the elephant owner's father was farming, followed by timber mill owner (22%), business (18%), temple job (10%), Government job (8%), teacher (8%) and 'Vaidya' or local healer (8%). The occupation of majority (42%) of the first mahout's father

was employment on daily wages followed by mahouts (18%), farming (14%), general works (4%), job in timber mills (2%), business (18%), govt. job (4%), and others such as driving, fishing and head load work (6%). The occupation of the majority (54%) of second mahouts were employment on daily wages followed by general workers (16%), farming (10%), business (8%), mahouts (6%) and other works (6%).

1.9 Motivation of elephant owners and mahouts for elephant rearing

Table 9. Distribution of elephant owners and mahouts according to their motivation for elephant rearing or mahoutship

Reason	Owner (n=40)*	First mahouts (n=50)	Second mahouts (n=50)
Hereditary	2 (5)	12 (24)	4 (8)
Own interest	25 (62.5)	38 (76)	46 (92)
To work in own timber mills	13 (32.5)	--	--

Figures in parenthesis indicate percentage
* Individual ownership only is considered

Data in Table 9 showed that majority (62.5%) of individual owners selected elephant keeping due to their personal interest. To work in own timber mills was the motivation for 32.5 per cent while for the rest 5 per cent the motivating factor was that their fathers owned elephants. Majority (70%) of the first mahouts opted mahoutship because of their personal interest. Twenty four per cent opted the job as successor to father. Most of the second mahouts (92%) selected this job due to their own interest and the rest 8 per cent as successor to father.

1.10 Gender of elephant owners and mahouts

Table 10. Distribution of elephant owners and mahouts according to their gender

n = 150

Category	Owner (f)	First mahouts (f)	Second mahouts (f)
Man	50 (100)	50 (100)	50 (100)
Woman	--	--	--
Total	50 (100)	50 (100)	50 (100)

Figures in parenthesis indicate percentage

All owners, first mahouts and second mahouts were of men as indicated in Table 10.

1.11 Marital status of mahouts

Table 11. Distribution of mahouts according to their marital status

n = 100

Sl. No.	Category	First mahouts (f)	Second mahouts (f)
1	Married	42 (84)	33 (68)
2	Unmarried	8 (16)	17 (34)
3	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Eighty four per cent of first mahouts and 66 per cent of second mahouts were married while 18 per cent of first mahouts and 34 per cent of second mahouts were unmarried as shown in Table 11.

1.12 Occupational hazards of mahouts

Table 12. Distribution of elephant mahouts according to the injury inflicted on them by the elephants

n = 100

Sl. No.	Category	First mahouts (f)	Second mahouts (f)
1	Injured	39 (78)	43 (86)
2	Not injured	11 (22)	7 (14)
3	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 12 indicated that majority of first mahouts (78%) and second mahouts (86%) had been injured from elephant attack while 22 per cent of the former and 14% of the latter had not been injured from elephant attack.

1.13 Degree of injury to the mahouts

Table 13. Distribution of elephant mahouts according the degree of injury inflicted on them

Sl.No.	Degree of injury	First mahouts (n=39)* f	Second mahouts (n=43)* f
1	Mild	23 (59)	34 (79)
2	Severe	16 (41)	9 (21)
	Total	39	43

Figures in parenthesis indicate percentage

*First and second mahouts who inflicted injury from elephants only is considered

Table 13 indicated that out of the mahouts who were injured from elephants, 59 per cent of first mahouts and 79 per cent of second mahouts got mild injuries while 41 per cent of first mahouts and 21 per cent of second mahouts got severe injuries.

1.14 Mahouts concept of the elephant

Table 14. Distribution of mahouts according to their concept of elephant

n = 100

Sl. No.	Concept	First mahouts f	Second mahouts f
1	Lord Ganapathi	44 (88)	45 (90)
2	Friend	6 (12)	5 (10)
	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Data on table 14 revealed that majority of the first mahouts (88%) and second mahouts (90%) were perceiving their elephant as Lord Ganapathi while 12 per cent of first mahouts and 10 per cent of second mahouts were considering them as their friend.

1.15 Amount of rest to the elephant

Table 15. Distribution of mahouts according to their perception of amount of rest that their elephant had

n = 100

Sl. No.	Rest	First mahouts f	Second mahouts f
1	Adequate	32 (64)	39 (78)
2	Somewhat adequate	6 (12)	4 (8)
3	Inadequate	12 (24)	7 (14)

Figures in parenthesis indicate percentage

Table 15 indicated that 64 per cent of the first mahouts and 78 per cent of the second mahouts felt that their elephants were getting adequate rest while 12 per cent of first mahouts and 8 per cent of second mahouts felt that their elephants were getting somewhat adequate rest. Twenty four per cent of the first

mahouts and 14 per cent of second mahouts felt that their elephants got inadequate rest.

2 Socio-economic variables of owners and mahouts

2.1 Income from job

Table 16. Distribution of elephant owners according to their annual gross income from elephant keeping

n = 40

Annual income (Rs.)	Owner * f
<1 lakh	26 (65)
1 lakh – 2 lakhs	9 (22.5)
>3 lakhs	5 (12.5)
Total	40 (100)

* Individual owners only
Figures in parenthesis represent percentage

Table 16 showed that most of the individual owners (65%) got an annual gross income of less than 1 lakh from elephant keeping between and 22.5 per cent got an annual income between 1 and 2 lakhs and 12.5 per cent got an annual income of more than 2 lakhs.

Table 17. Distribution of first and second mahouts according to their annual income from mahoutship

n = 100

Sl. No.	Annual income (Rs.)	First mahouts f	Second mahouts f
1	30,000 – 35,000	(10)	17 (34)
2	35,000 – 40,000	13 (26)	21 (42)
3	40,000 – 45,000	14 (28)	12 (24)
4	45,000 – 50,000	11 (22)	0
5	50,000 – 55,000	5 (10)	0
6	55,000 – 60,000	2 (4)	0
	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 17 indicated that twenty eight per cent of first mahouts were earning an annual income between Rs.40,000 and Rs.45,000. Twenty six per cent were earning between Rs.35,000 and Rs.45,000, 22 per cent were earning between of Rs.45,000 and Rs.50,000, 10 per cent were earning between Rs.50,000 and Rs.55,000, and the rest 4 per cent were earning between Rs.55,000 and Rs.60,000. Forty two per cent of second mahouts earned an income between Rs.35,000 and Rs.40,000, 34 per cent earned an income between Rs.30,000 to Rs.35,000, and the rest 24 per cent earned an income between Rs.40,000 to 45,000.

2.2 Income from other sources for owners and mahouts

Table 18. Distribution of elephant mahouts according to income from sources other than elephant ownership

n = 40

Sl.No.	Income	Owners *
1	<2 lakhs	18 (45)
2	2 to 4 lakhs	18 (45)
3	>4 lakhs	4 (10)
Total		40 (100)

Figures in parenthesis indicate percentage
* Individual owners only

Data in table 18 indicated that 45 per cent each of elephant owners had an income of less than 2 lakhs as well as 2 lakhs to 4 lakhs from sources either from elephant ownership. Ten per cent had an annual income of more than Rs.4 lakhs.

Table 19. Distribution of mahouts according to their income from sources other than mahoutship

n = 100

Sl. No.	Income	First mahouts f	Second mahouts f
1	No income	48 (96)	45 (90)
2	<5000	1 (2)	--
3	5000 – 10,000	1 (2)	3 (6)
4	>10,000	--	2 (4)
	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Data in Table 19 showed that 96 and 90 per cent respectively of first and second mahouts had no income at all from sources other than mahoutship. Two per cent each of first mahouts had an income of less than Rs.5000 and Rs.5000 to Rs.10,000. Among second mahouts 6 per cent and 4 per cent respectively had an income between Rs.5000 and Rs.10,000 and above Rs.10,000.

2.3 Land holding of elephant owners and mahouts

Table 20. Distribution of elephant owners according to land owned

n = 40

Sl. No.	Category	Owners* f
1	< 1 Acre	16 (40)
2	1 to 3 acre	23 (57.5)
3	>3 acre	1 (2.5)
	Total	40 (100)

*Individual elephant owners only

Table 20 revealed that majority (57.5%) of the individual elephant owners owned 1 to 3 acres of land while 40 per cent and 2.5 per cent respectively owned less than an acre and more than an acre.

Table 21. Distribution of mahouts according to land owned

n = 100

Sl. No.	Land	First mahouts f	Second mahouts f
1	No land	13 (26)	10 (20)
2	<10 cents	22 (44)	34 (68)
3	11-20 cents	10 (20)	5 (10)
4	>20 cents	5 (10)	1 (2)
	Total	50 (100)	50 (100)

Figures in parenthesis indicate percentage

Table 21 revealed that 26 and 20 per cent of first and second mahouts respectively had no land. Forty four and 68 per cent of first and second mahouts respectively had less than 10 cents. Twenty and ten per cent of first and second mahouts respectively had 11 to 20 cents. More than 20 cents was owned by 10 and 2 per cent of first and second mahouts respectively.

3 Knowledge of elephant management

3.1 Knowledge of elephant owners

Table 22. Distribution of elephant owners according to their knowledge on elephant management

n = 50

Sl. No.	Knowledge	F	Percentage
1	High (88-105)	16	32
2	Medium (76-87)	19	38
3	Low (47-75)	15	30
Total		50 (100)	50 (100)

Figures in parenthesis indicate knowledge score

Data in table 22 reveal that thirty eight per cent of the owners had medium knowledge of scientific elephant management. Thirty two per cent had high knowledge while 30 per cent had low knowledge of elephant management.

Table 23. Domain wise knowledge of elephant management of elephant owners

Sl. No.	Domain	Mean score (x)	Percentage mean score	Rank
1	Disease management	32.08 (SD=4.51)	74.06	I
2	Harness	13.18 (SD=2.76)	73.22	II
3	General management	34.86 (SD=5.69)	69.72	III

The data in table 23 reveal that the elephant owners had more knowledge of disease management followed by harness and general management, with respective mean scores of 74.06, 73.22 and 69.72.

Table 24. Comparison of knowledge on elephant management of individual and institutional owners applying Hotelling's T squared test

Sl. No.	Category	Number of samples	F value	T-square value	Degrees of freedom	Probability
1	Individual owners	40	2.02	6.38	46	0.124483
2	Institutional owners	10			3	

The results of Holellings' T-squared test (Table 24) reveal that there was no significant difference between individual and institutional owners regarding their knowledge of elephant management. The F value obtained was 2.02 and the T-square value 6.38.

Table 25. Correlation between socio-personal variables and knowledge of elephant management to the owners

Socio-personal variables	Knowledge total r value	Knowledge disease management r value	Knowledge harness r value	Knowledge general management r value
Age	0.0683	-0.0904	-0.232	0.8934*
Education	0.1891	-0.0603	0.0223	0.1987
Experience	0.9943*	0.5084*	0.0966	0.1592

* Significant at 5 per cent level

According to data presented in Table 25 there was significant positive correlation between experience of elephant owners and their knowledge of elephant management in general and knowledge of disease management in particular, at 5 per cent level.

Age of the elephant owners and their knowledge of general management of elephants were positively and significantly correlated at 5 per cent level. Education of elephant owners was not correlated with their knowledge of elephant management, in general or with any of the three knowledge domains.

Table 26. Ten most known practices of elephant management to the elephant owners

Sl. No.	Practices	Mean score
1	Feeding practices of elephants in musth	91.66
2.	Signs of impaction	84.66
3	Signs of weakness/infectious disease	84.44
4	General signs of weakness or illness	84.00
5	Management and control of elephants in musth	80.25
6	Signs of musth	79.87
7	Amount of palm leaves required for an adult elephant/day	78.78

8	Precautionary measures to reduce the degree of impaction after the onset	77.25
9	Precautionary measures to be followed when the elephant is taken out after musth	76.76
10	Any four ingredients of balanced ration for an elephant	76.4

Table 26 indicated the ten most known management practices to the elephant owners. These practices in the descending order of percentage mean score were, feeding practices of elephants in musth (91.66), signs of impaction (84.66), signs of a good elephant (84.44), general signs of weakness or illness (80.25), management and control of elephants in musth (79.87), signs of musth (79.87), amount of palm leaves required per day (78.78), measures to reduce the intensity of impaction after onset (77.25), precautions while taking out elephants after musth (76.76) and ingredients for balanced ration (76.40).

Table 27. Ten least known practices of elephant management to elephant owners

Sl. No.	Practices	Mean score
1	Causes of impaction	52.51
2	Maximum weight that can be lifted by an elephant	48
3	Minimum quantity of drinking water required for an adult elephant per day	45.50
4	Maximum walkable distance with maximum bearable weight	45.45
5	The normal thickness of restraining chains	45.40
6	Gestation period	42.40
7	Normal length of restraining chains	36.36
8	Normal length of neck rope	36.36
9	Common health problems of elephants during festival seasons	27.20
10.	Methods of determining age of elephants	27.00

The data in table 27 revealed the ten least known practices of elephant management in the discending order of percentage mean score were causes of

impaction (52.51), maximum weight that an elephant can lift (48.00), minimum quantity of drinking water required for an adult elephant per day (45.50), maximum walkable distance with maximum bearable weight (45.45), the normal thickness of restraining chains (45.40), gestation period(42.40), normal length of restraiting chains (36.36), normal length of neck rope (36.36), common health problems of the elephant during festival season (27.20) and scientific methods of determining age of elephants (27.00).

3.2 Knowledge of elephant management to mahouts

Table 28. Distribution of first mahouts according to their knowledge of elephant management

n = 50

Sl. No.	Knowledge	Frequency	Percentage
1	High (98 and above)	16	32
2	Medium (87 to 97)	22	44
3	Low (64 to 86)	12	24
	Total	50	100

Figures in parenthesis indicate knowledge score

Table 28 showed that 44 per cent of the first mahouts were having medium knowledge, 32 per cent were having high knowledge and 24 per cent were having low knowledge of elephant management.

Table 29 Domain wise knowledge of elephant management to first mahouts

Sl. No.	Domain	Mean score	Percentage mean score	Rank
1	Disease management	18.62 ± 2.92*	74.48	2
2	Harness	26.84 ± 3.70*	74.55	1
3	General management	47.36 ± 6.30*	64.02	3

* Standard deviation

According to Table 29 the first mahout's knowledge of harness practices was the highest followed by disease management and general management as indicated by the respective knowledge score viz., 74.48, 74.55 and 64.02.

Table 30. Ten most known elephant management practices to first mahouts

Sl. No.	Practices	Percent mean
1	Different types of commands	94.00
2.	Necessity of appreciating the elephant for obedience	91.11
3.	The method of applying belly chain on elephants	91.10
4	The most common health problems in elephants during festival season	91.10
5	Signs of impaction	91.00
6	Methods of restraining mischievous elephants and elephants in musth	91.00
7	Precautions while riding the elephant	89.30
8.	Methods of controlling and managing elephants in musth	88.75
9.	Precautions while taking out the elephants immediately after musth	88.00
10.	Feeding of elephants in musth	86.60

Table 30 showed the ten most known elephant management practices to the first mahouts. These practices in the descending order of percentage mean score were, the different types of commands (94.00), necessity of appreciating the elephant for obedience (91.11), method of applying belly chain (91.10), most common health problems during festival season (91.10), symptoms of impaction (91.00), restraining mischievous and elephants in musth (91.00), precautions while riding the elephant (89.30), methods of controlling and managing elephants in musth (88.75), precautious while taking out the elephant immediately after musth period (88.00) and feeding practice of elephants in musth (86.60).

Table 31. Ten least known elephant management practices to first mahouts

Sl. No.	Practices	Percentage mean score
1	Methods to be adopted while taking elephant in hot weather	43.00
2.	Water requirements (normal) for an adult elephant per day	40.00
3	Precautions to be taken by mahouts while experts make use of the capture gun to immobilise the elephant	33.75
4	Signs of heat in female elephant	32
5	Symptoms of water deficiency in elephants	26.65
6	Method of knowing aged elephants from external appearance	23
7	Techniques of first aid for wound in elephants	20
8	Various methods of sitting on the elephant	17.33
9	Different methods of mounting on elephants	15.53
10	Method of detecting age of an elephant	9.8

Table 31 revealed the ten least known management practices to first mahouts. These practices in the descending order of percentage mean score were, methods to be adopted while taking the elephants in hot weather (43.00), water requirement for an adult elephant (40.00), precautious to be taken by mahouts while experts make use of capture gun to immobilize the elephant (33.75), signs of heat in female elephants(32.00), signs of inadequate drinking water intake (26.65), methods of knowing aged elephants from external appearance (23.00), techniques of first aid for wounds in elephants (20.00), various methods of sitting on the elephant (17.33), all different methods of mounting on elephants (15.53) and method of detecting the age of an elephant (9.8).

Table 32. Correlation between socio-personal variables and first mahouts knowledge of elephant management

Socio-personal variables	Knowledge			
	Overall knowledge (r value)	Disease management (r value)	Harness (r value)	General management (r value)
Age	0.3196*	0.282*	0.322	0.292
Experience	0.466502*	0.5876*	0.3383*	0.4096
Education	-0.02771	-0.0322	-0.0212	-0.1212

* Significant at 5 per cent level

Data in Table 32 indicate the significant and positive correlation between age and overall knowledge of elephant management. Experience was significantly correlated with overall knowledge of elephant management as well as with three domains independently viz., harness, disease management and general management. Education was not correlated with knowledge of elephant management.

Table 33. Correlation between socio economic variables and first mahouts knowledge of elephant management

Sl. No.	Socio-economic variables	Knowledge (r value)
1	Land holding	+0.1003
2	Income from other sources	-0.2891
3	Income from mahoutship	+0.05621

Data in table 33 showed that none of the socio-economic variables viz., land holding, income from other sources and income from mahoutship were correlated with first mahouts knowledge of elephant management.

3.3 Second mahout's knowledge

Table 34 Distribution of second mahouts according to their knowledge of elephant management

n = 50

Level of knowledge	Frequency	Percentage
High (95 and above)	16	32
Medium(77-94)	19	38
Low(≤76)	15	30
Total	50	100

Figures in parenthesis indicate knowledge score

Table 34 showed that 38 per cent of the second mahouts were having medium knowledge, 32 per cent were having high knowledge and 30 per cent were having low knowledge of elephant management.

Table 35. Domain wise knowledge of elephant management to the second mahouts

Sl. No.	Domains	Mean score	Percentage mean score	Rank
1	Disease management	16.46 ± 3.671	65.84	2
2	Harness	25.13 ± 4.24	69.72	1
3	General management	43.02 ± 8.09	58.13	3

Table 35 revealed that the second mahouts were having more knowledge of harness practices followed by disease management and general management with respective percentage mean scores of 69.72, 65.84 and 58.13.

Table 36. Correlation between socio-personal variables and second mahouts knowledge of elephant management

Socio-personal variable	Overall knowledge (r value)	Knowledge		
		Disease management (r value)	Harness (r value)	General management (r value)
Age	0.2276	0.18351	0.30116*	0.15258
Education	0.0692	0.17086	0.96861*	-0.00872
Experience	-0.09133	-0.01890	-0.0459	-0.0292

* Significant at 5 per cent level

Table 36 showed that the second mahout's age and education were positively and significantly correlated with their knowledge of harness practices. Education was not correlated with overall knowledge of elephant management and the experience was negatively correlated with the three constituent domains of knowledge viz., harness, disease management and general management.

Table 37 Correlation between socio-economic variables and second mahouts knowledge of elephant management

Sl. No.	Socio-economic variable	Knowledge total (r value)
1	Income from the job	0.1996
2.	Income from other source	-0.16931
3.	Landholding	+0.06123

Table 37 indicated that none of the socio-economic variables, viz., income from job, income from other sources and landholding were correlated with the second mahout's knowledge of elephant management.

Table 38 Ten most known elephant management practices to second mahouts

Sl. No.	Practices	Percentage mean score
1	The different types of commands	96.5
2.	Method of controlling/securing elephant using belly chain	96.0
3	Methods to be adopted to put down violence during musth	89.0
4	General signs of impaction	87.5
5	Necessity for appreciating the elephant for obedience	87.0
6	Most ideal time of the day for taking the elephant on foot	82.5
7	Feeding practices of elephants in musth	81.0
8	Skills and practices in which elephant mahout should have basic knowledge	80.8
9	Care and control of elephants during musth	80.25
10.	Precautionary measures to be taken by mahouts while taking out elephants after musth period	80.00

Table 38 revealed the ten most known elephant management practices to the second mahouts. These practices in the descending order of their percentage mean score were the different types of commands (96.5), method of securing the elephant using belly chain (96.00), methods to be adopted to put down violence during musth (89.00), general signs of impaction (87.50), necessity for appreciating the elephant for obedience (87.00), most ideal time of the day for taking the elephant on foot (82.50), feeding practices of elephants in musth (81.00), skills and practices in which second mahouts should have basic knowledge (80.80), care and control of elephants during musth (80.25), and precautionary measures to be taken by mahouts while taking out the elephant soon after musth (80.00).

Table 39. Ten least known elephant management practices to second mahouts

Sl. No.	Practices	Percent mean
1	Precautions to be taken by mahouts while experts use capture gun to immobilise the elephant	37.5
2.	Precaution by mahouts at the time of performance in temple	37.5
3.	Water requirement (approx.) for an adult elephant per day	37.0
4	Methods of determining age of elephants	37.0
5	Methods of knowing aged elephants from external appearance	36.2
6	Approximate age of the elephant when it start showing musth	31.0
7	Symptoms of heat in female elephants	30.25
8	All different methods of sitting on elephants	27.0
9	Different methods of mounting on elephants	25.0
10	Signs of drinking water deficiency	17.15

Table 39 revealed the ten least known practices to second mahouts. These in the descending order of percentage mean score were precautions to be taken by mahouts while experts use capture gun to immobilise the elephant (37.50), precautions at the time of performance in temples (37.50), approximate water requirement for an adult elephant per day (37.00), methods of determining age of elephants (37.00), knowing an aged elephant from external appearance (36.20), approximate age of elephant when it generally starts showing musth (31.00), symptoms of heat in female elephants (30.25), all different methods of sitting on elephants (27.00), different methods of mounting on elephants (25.00) and signs of drinking water deficiency (17.15).

4 Adoption of elephant management practices by first mahouts

Table 40. Distribution of first mahouts based on adoption of elephant management practices (respondent wise)

n = 50

Sl. No.	Category	Frequency	Percentage
1	High (55 and above)	16	32
2	Medium (48 to 54)	20	40
3	Low (≤47)	14	28
	Total	50	100

Figures in parenthesis indicate adoption score

Data in table 40 indicated that 40 per cent of the first mahouts were medium adopters of elephant management practices. Thirty two per cent were high adopters while 28 per cent were low adopters.

Table 41 Domains of elephant management and their ranking based on adoption

Sl. No.	Domains of elephant management	Total number of practices in each domain	Adoption Quotient	Rank
1	Disease management	20	83.8	1
2	Harness	25	82	2
3	General management	19	72.84	3
	Overall	64	79.46	

Figures in parenthesis indicate percentage

The data in Table 41 revealed that disease management practices were the most adopted followed by harness practices and general management practices as indicated by the respective adoption quotients of 83.8, 82.00 and 72.84. The overall adoption quotient was 79.46.

4.2 Relationship between independent variables and adoption

Table 42 Correlation between socio-personal variables and adoption of elephant management practices by first mahouts

Sl. No.	Socio-personal variables	Adoption			
		General management (r value)	Harness (r value)	Disease management (r value)	Total (r value)
1	Education	-0.1022	-0.2347	-0.1273	-0.1792
2	Age	0.128	0.153	0.211	0.2119
3	Literacy	0.1070	0.148	0.164	0.1595
4	Experience	0.3766*	0.412*	0.380*	0.444*

* Significant at 1 per cent level

It is evident from Table 42 that among the socio-personal variables studied viz., age, education, literacy and experience of first mahouts experience was positively and significantly correlated with overall adoption of elephant management practices as well as with all constituent domains viz., adoption of general management, harness and disease management practices.

Table 43 Correlation between socio-economic variables and adoption of elephant management practices by first mahouts

Sl. No.	Socio-economic variable	Total adoption score (r value)
1	Income from job	0.247
2	Income from other sources	0.387**
3	Land holding	0.283**

** Significant at 5 per cent level

Data in Table 43 revealed that among the socio-economic variables studied viz., income from mahoutship, income from other sources and landholding of the first mahouts, income from other sources and landholding

were positively and significantly correlated with adoption of elephant management practices.

Table 44. Correlation between knowledge and adoption of elephant management by first mahouts

Domains of adoption	Knowledge			
	Disease management (r value)	Harness (r value)	General management (r value)	Total (r value)
Disease management	0.5987*	0.606*	0.574*	0.623*
Harness	0.6061*	0.465*	0.418*	0.533*
General management	0.5317*	0.528*	0.559*	0.543*

* Significant at 5 per cent level

Data in Table 44 showed that adoption of elephant management practices, in general, as well as all three constituent domains viz., disease management, harness and general management by first mahouts was positively and significantly correlated with the mahouts knowledge of elephant management, in general, and with all three constituent domains viz., disease management, harness and general management.

4.3 The most adopted and least adopted practices by the first mahout

Table 45 Ten most adopted elephant management practices by the first mahouts

Sl. No.	Practices	Mean score
1	Use of belly chains while taking elephant out on foot	97.8
2	Taking the elephant on foot over long distances during early morning and evening only	95.7
3	Providing adequate feed and water during musth period	95.6
4	Proper restraining methods of mischievous elephants and elephants in musth	94.66
5	Precautions taken while riding the elephant	92.5
6	Methods of giving commands	87.5
7	Early signs of impaction usually observed	85.25
8	Proper methods of restraining elephants in musth	84.75
9	Taking the elephant on foot for not more than 40 km/day (approx.) during favourable weather	84.7
10	Control methods practiced while elephant is taken out after musth	84.66

Data in table 45 indicated the ten most adopted elephant management practices in the descending order of their percentage mean score. They were using belly chains while taking the elephant out on foot (97.80), taking the elephant on foot over long distances during early morning and evening only (95.70), providing adequate feed and water during musth period (95.60), proper restraining methods of mischievous elephants and elephants in musth (94.66), precautions taken while riding the elephant (92.50), methods of giving commands (87.50), early signs of impaction usually observed (85.25), proper methods of restraining elephants in musth (84.75), taking the elephant on foot for not more than 40 km/day (approx.) during favourable weather (84.70) and control methods followed while elephant is taken out soon after musth (84.66).

Table 46. Ten least adopted elephant management practices by first mahouts

Sl. No.	Practices	Mean per cent
1	Methods to be adopted to reduce the degree of seriousness of impaction once its symptoms are noticed	76
2	Precautionary measures while using ankush	75
3	Methods used to correct small mistakes and mischieves of elephants	73
4	Precautionary measures while caning hind limb	71
5	Providing at least 250 l of drinking water/elephant/day	67.3
6	Properly restraining during festival performance	65
7	Making to walk below 6 km with the maximum weight it can bear	53.19
8	Usage of chains with thickness ½", 5/8" or ¾"	50
9	Making the animal to carry only less than 500 kg at a stretch	36.17
10	Procedures to be adopted while the elephant is made to walk a long time during hot weather	21.5

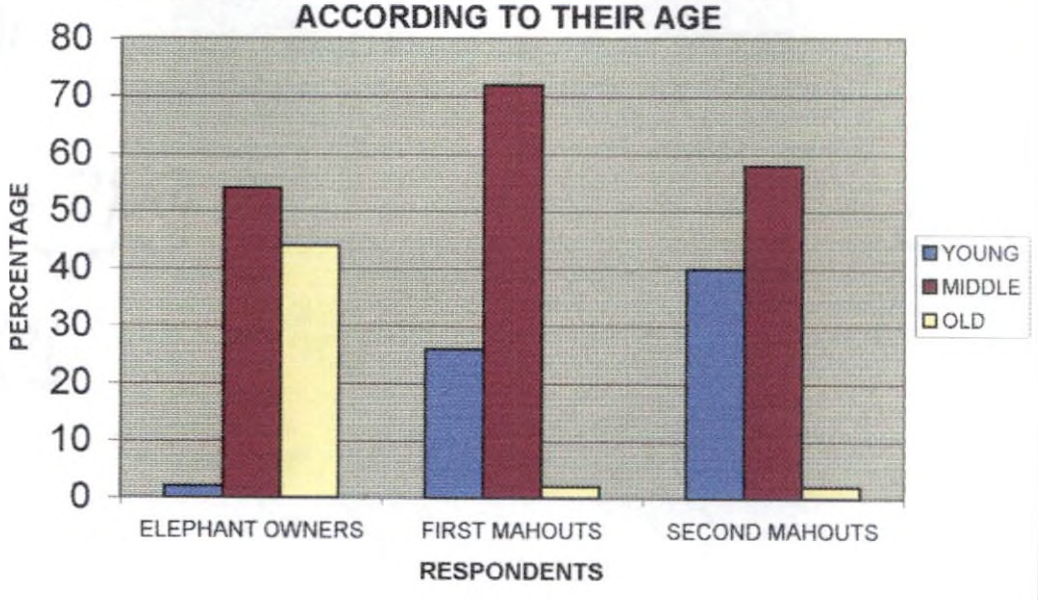
Data in table 46 indicated the ten least adopted elephant management practices in the descending order of percentage mean score. They were methods adopted to reduce the intensity of impaction once symptoms are noticed (76.00), precautionary measures while using ankush (75.00), methods to correct small mistakes and mischieves (73.00), precautionary measures while caning at hind limbs (71.00), providing at least 250 litres of drinking water per day (67.30), properly restraining during performance at festivals (65.00), taking the elephant on foot, with maximum bearable weight for less than 6 km (53.19), using chains of thickness ½", 5/8" or ¾" (50.00), making the elephant to carry only less than ½ ton weight at a stretch (36.17) and procedures to be adopted while taking the elephant on foot for long distances in hot weather (21.50).

Table 47 Training needs of elephant owners, first and second mahouts

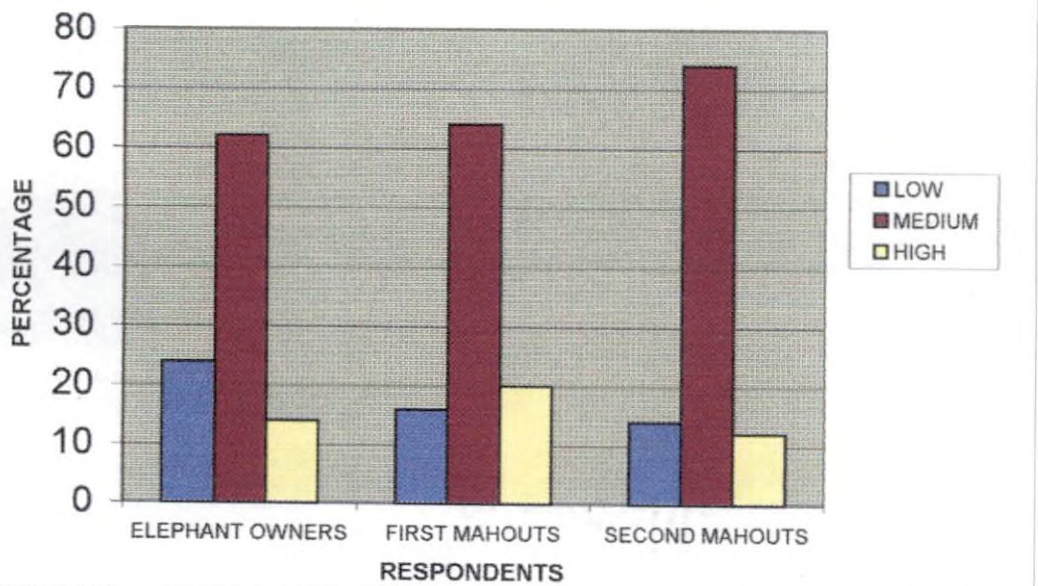
Sl. No.	Respondent	Total knowledge score	Average knowledge score (C) (b/ax50)	Training need score (I-C)
1	Owner	3912.50	0.7049	0.2951
2	First mahout	4652.00	0.689	0.3111
3.	Second mahout	4269.00	0.632	0.368

The data in table 47 reveal that the second mahouts had the highest training need score (0.368), followed by the first mahout (0.311) and the elephants owners (0.2951).

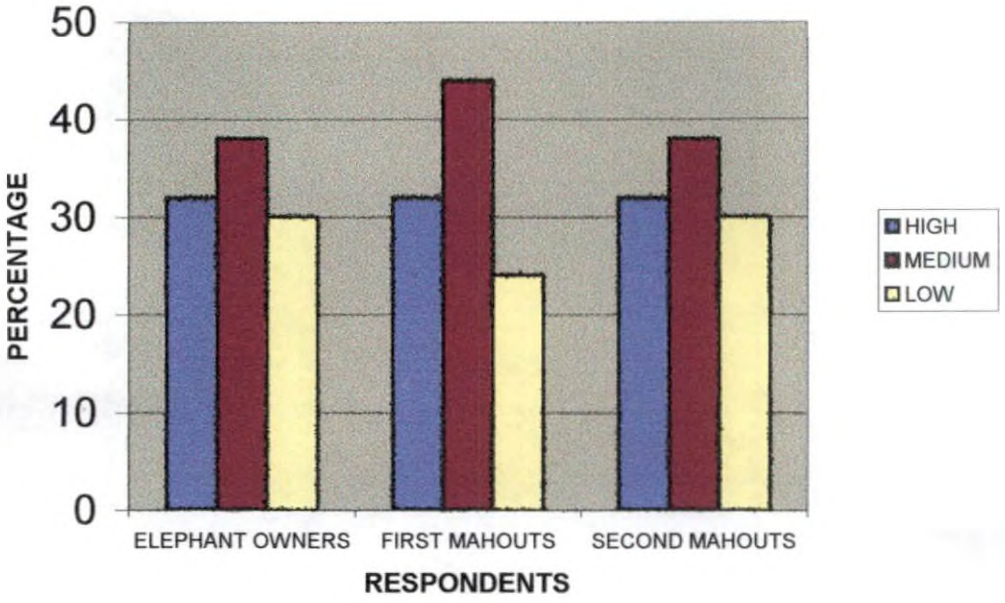
1. DISTRIBUTION OF OWNERS AND MAHOUTS ACCORDING TO THEIR AGE



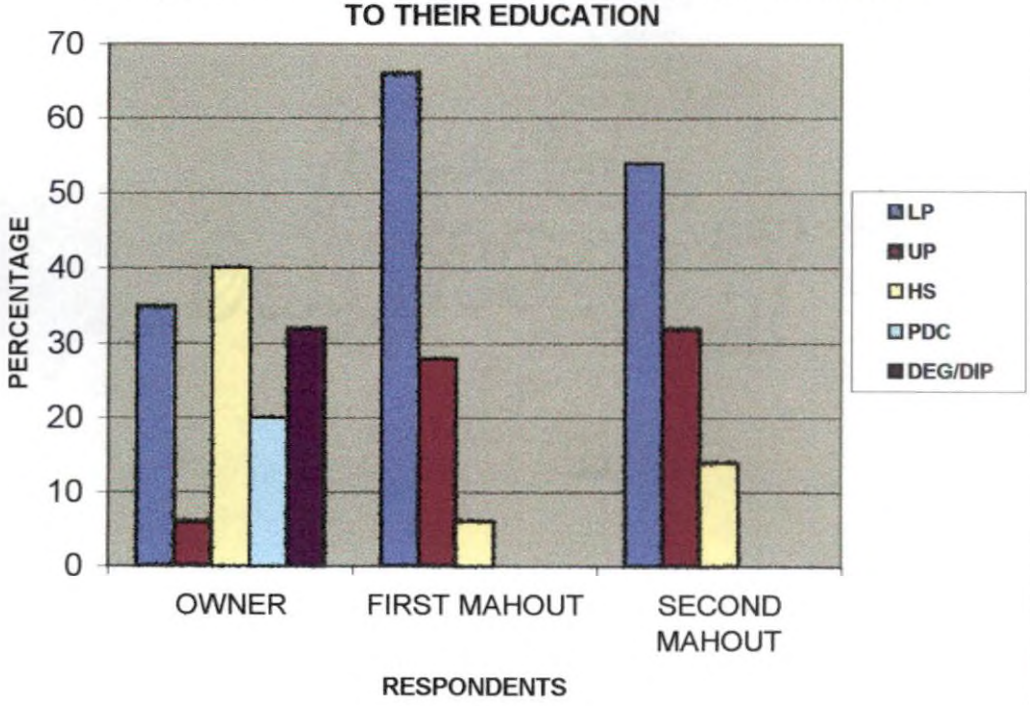
2. DISTRIBUTION OF OWNERS AND MAHOUTS ACCORDING TO THEIR EXPERIENCE



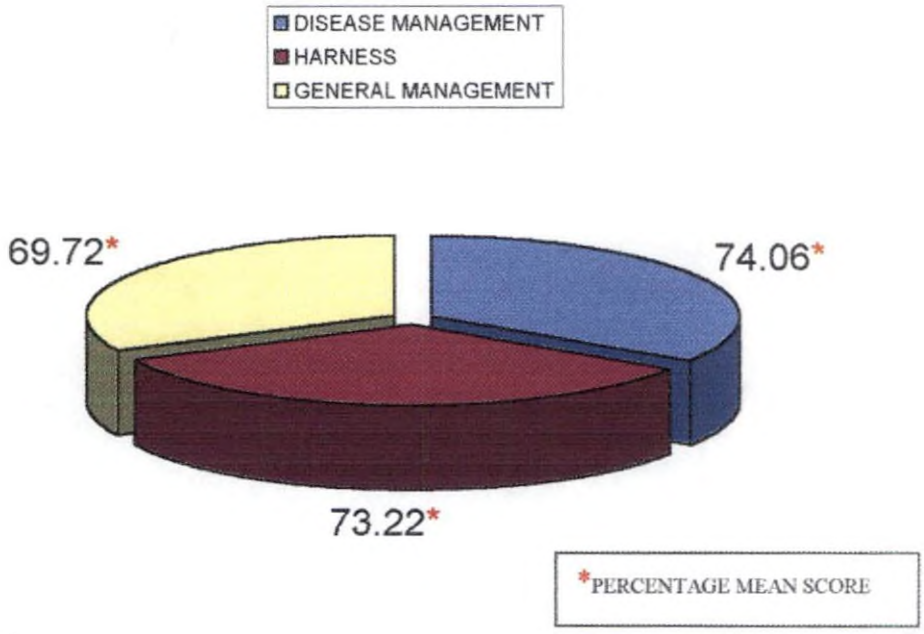
3.DISTRIBUTION OF ELEPHANT OWNERS,FIRST AND SECOND MAHOUTS ACCORDING TO THEIR LEVEL OF KNOWLEDGE



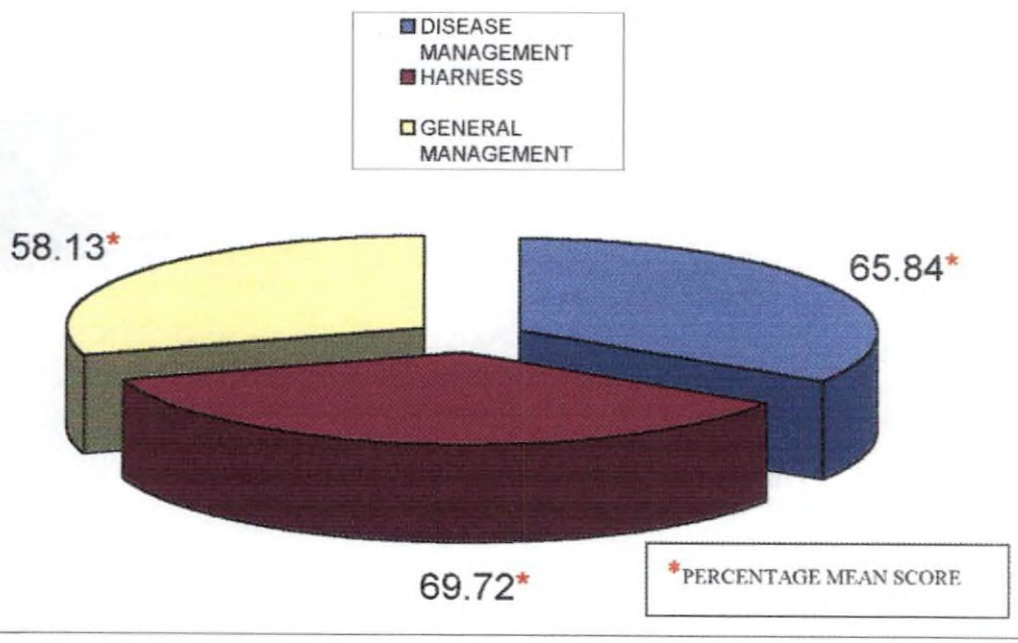
4.DISTRIBUTION OF OWNERS AND MAHOUTS ACCORDING TO THEIR EDUCATION



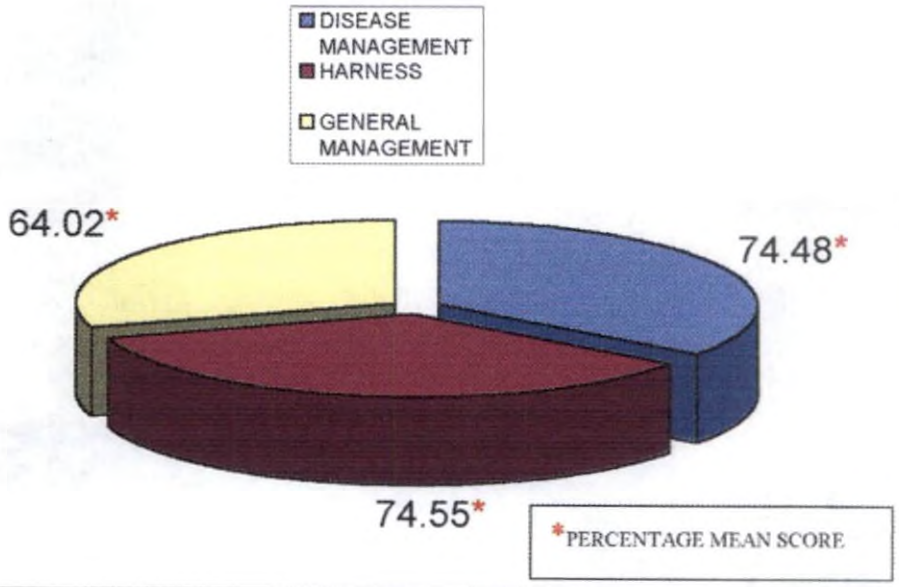
5. DOMAIN WISE KNOWLEDGE OF ELEPHANT OWNERS



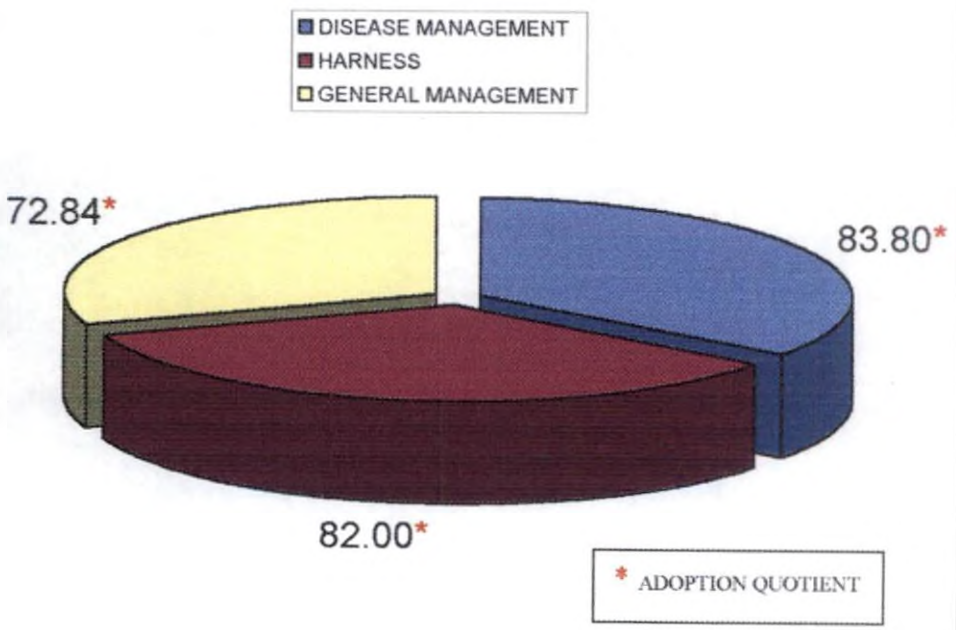
6. DOMAINWISE KNOWLEDGE OF SECOND MAHOUTS



7. DOMAIN WISE KNOWLEDGE OF FIRST MAHOUTS



8. DOMAIN WISE ADOPTION OF ELEPHANT MANAGEMENT PRACTICES BY FIRST MAHOUTS



Discussion

5. DISCUSSION

Socio-economic profile of elephant owners and mahouts gave a picture of their socio-economic background. Elephant owners were socio-economically better of while mahouts were not so. It was as if there were no other source of livelihood to the mahouts that they opted this job. The following facts amply revealed that elephant owners and mahouts were from distinct strata of society. While elephant owners mostly were educated and belonged to one of the socio-economically forward communities, the nair, mahouts mostly were illiterates and belonged to a socio-economically weaker section of society, the scheduled caste. When elephant owners were children of timber mill owners, businessmen, Government employees etc. mahouts mostly were children of labourers and even one-fifth were children of mahouts themselves. Owners were land rich unlike mahouts who were almost landless and the former had other sources of income whereas the latter had none. Lair (1997) had also reported that elephant owners were a distinct strata from the economic perspective. Only one similarity noted was that both owners and mahouts opted elephant keeping out of their own interest. Further, it was a risky job for mahouts for most of them on one occasion or the other sustained injuries and first mahouts sustained more serious injuries than the second mahouts.

The finding that elephant owners knowledge of disease management was comparatively better than their knowledge of harness and general management threw light on the fact that elephant owners were more concerned of diseases obviously because they realized the importance of such knowledge. Ignorance would entail high risk and loss. Knowledge of harness was one closer to disease management might be due to the reason that the importance of harness was also felt to be very vital since there should be perfect control on elephants. Knowledge of general management was the least which included feeding practices as well among others and insufficient knowledge of scientific feeding practices would tell upon the general health and draught efficiency of elephants. Regarding management of livestock species, Gill and Singh (1977) reported about the dairy farmers' low knowledge of breeding, feeding and animal health. Nataraju and Channegowda (1986) and Nisha and Subrahmanian (1997) too reported that majority of dairy farmers had only medium knowledge of dairy management practices.

A cursory look into the least known practices to the elephant owners, revealed a hard fact that they would not be able to take right decisions nor would be able to guide the mahouts on many vital issues. This might lead to over-burdening of the elephant, one way or the other. These least known practices, for instance, were causes of impaction, maximum weight that can be lifted by the

elephant, minimum quantity of drinking water required for an adult elephant, maximum walkable distance with maximum bearable weight, the normal thickness of restraining chains, gestation period, normal length of restraining chains and neck ropes, common health problems of elephants during festival season and methods of determining age of elephants.

However, on certain vital aspects the elephant owners had comparatively better knowledge and so much so they might be taking right decisions at right time and might be guiding the mahouts properly. These practices for instance were feeding practices of elephants in musth, signs of impaction, signs of weakness/infectious diseases, general signs of weakness/illness, management and control of elephants in musth, signs of musth, amount of palm leaves required for the elephant, precautionary measures to be followed when the elephant is taken out after musth and ingredients of balanced ration. Even so, it should be noted that, a better knowledge of scientific elephant management pertains only to above few practices transcending the three major domains viz., Disease management, harness and general management which included many other practices and that almost two-third of elephant owners had only either medium or low knowledge of scientific elephant management practices as mentioned else where.

Further the finding that there was no significant difference between individual and institutional owner's knowledge of elephant management

indicated the importance of training to both. Joy (1990) had also reported the importance of scientific knowledge of elephant management to mahouts. Jacob and Trevor (2000) and Panicker (1998) emphasised the significance of training to elephant keepers and owners. The finding that, age was positively and significantly correlated with knowledge of general management and that experience was positively and significantly correlated with knowledge in general as well as knowledge of disease management in particular indicated the importance of age and experience to elephant keeping. However, Sheela and Sundaraswamy (1999) reported that age and knowledge of dairy management practices were not correlated.

Like that of elephant owners the first mahouts knowledge of scientific elephant management was not at all satisfactory as almost two-third of them had either medium or low knowledge. A fair knowledge of scientific elephant management is equally relevant to first mahouts. Perhaps, the first mahouts should have an even better knowledge than the owners being full time attendants of elephants and directly responsible to the daily chores. The necessity for improved knowledge of scientific management practices to the mahouts was also reported by Joy (1990), Ponnappan (1998), Nibha (1998) and Damodaran (2000).

The finding that, among the three major knowledge domains, the first mahouts knowledge of harness was more than that of either disease management

or general management indicated the relative importance given to control or restraint measures. The first mahouts will be answerable for any untoward happening hence they have to be very critical about harness. Next to harness they had more knowledge of disease management than general management. The comparatively lesser knowledge of general management was noted in the case of owners too and since this domain included feeding aspects among others, it is important to have adequate knowledge as mentioned elsewhere.

Information on the ten comparatively least known practices to the first mahouts revealed the fact that their ignorance could lead to hardships or even meting out cruelty to the elephants intentionally or unintentionally. For instance, methods to be adopted while taking the elephant in hot weather, drinking water requirements, precautions to be taken by mahouts while experts make use of the capture gun to immobilize the elephant, cow elephants in heat, signs of water deficiency in elephants, methods of knowing aged elephants from external appearance, techniques of first aid for wound, various methods of sitting on elephant, different methods of mounting on elephant, and scientific method of detecting age were the comparatively least known practices. Nevertheless, on certain aspects of elephant management the first mahouts had comparatively better knowledge. These aspects were different types of commands, necessity of appreciating the elephant for obedience, the method of applying belly chains,

most common health problems during festival season, signs of impaction, methods of restraining, mischievous elephants and those in musth, precautions while riding, methods of controlling and managing during musth period, precautions while taking out elephants soon after musth and feeding them in musth. It is appreciable that the first mahout had a comparatively better knowledge of these important aspects pertaining to disease management, harness and general management. However, most of these practices related to harness and musth obviously because lack of knowledge might lead to endangering the life of the mahouts themselves and public.

The importance of age and experience to elephant management was evinced by the significant correlation between age and knowledge of scientific management in general and disease management in particular as well as the significant correlation between experience and knowledge of scientific management in general and in particular knowledge of disease management and harness.

As was the case with owners and first mahouts about two-third of the second mahouts had medium or low knowledge of scientific elephant management. It is again an unsatisfactory situations as second mahouts many a time have to perform the role of first mahouts and even otherwise the former are also responsible to carry out the daily chores.

Like the first mahouts, second mahouts had comparatively better knowledge of harness than either disease management and general management indicating the importance given to restraint. Knowledge of general management as in the case of elephant owners and first mahouts was comparatively much lesser which spoke of a general negligence on the part of all parties concerned viz., owners as well as mahouts.

It is however appreciable that the second mahouts had comparatively better knowledge of certain important practices such as different types of commands, method of controlling using belly chains, methods to be adopted to put down violence during musth, general sings of impaction, necessity for appreciating the elephant for obedience most ideal time of the day for taking elephant on foot, feeding practices of elephants in musth, skills and practices in which mahouts should have basic knowledge like climbing palm trees, swimming etc. Care and control during musth, and precautionary measures to be taken by mahouts while taking out after musth period. However, the least known practices of second mahouts revealed the fact that they are less well versed in management practices and disease management than in harness practices. This include precautions to be taken by mahouts while experts using capture gun to immobilise the elephant, precautions by mahouts at the time of performance in temple, water requirement (approx.) for an adult elephant per day, methods of

knowing aged elephant from external appearance, approximate age of elephants when it start showing musth, symptoms of heat in female elephants, all different methods of sitting on elephants, different methods of mounting on elephant and signs of drinking water deficiency.

The importance of age of the second mahouts was indicated by the significant and positive correlation between the same and knowledge of harness.

The level of adoption of scientific management practices like that of knowledge of management practices was one far from satisfactory, because level of adoption of practices by almost 2/3rd of first mahouts was either low/medium. Sohi and Kherde (1980), Sharma (1994), Shreesailaja and Veerabhadraiah (1994) reported similar findings regarding adoption of dairy husbandry practices.

Among the three domains, adoption of practices was comparatively higher in the case of disease management followed by harness practices and general management practices as indicated by adoption quotient. Adoption of harness practices was close on the heels of disease management. Practices pertaining to disease management and harness are very significant and are to be practiced without any laxity considering public safety.

Higher adoption was due to the higher knowledge of these practices as evidenced from a positive and significant correlation between adoption and

knowledge. Tyagi and Sohal (1984) too reported the significant positive correlation between knowledge and adoption in the case of dairy management practices. Raju (1982) reported the influence of knowledge of the recommended dairy practices and adoption. Experience was also found significant in adoption of management practices as established by a significant and positive correlation between the former and latter. This finding is in agreement with the finding of Anil *et al.* (2000) who reported a positive and significant correlation between experience and adoption of dairy management practices. Similarly income from other sources and land holding had influence on adoption as the former were positively and significantly correlated with the latter. However, Singh and Dubey (1978) and Subhadra (1979) had reported a negative correlation between land holding and adoption of dairy husbandry practices.

A critical analysis of least adopted practices was suggestive of the possibility of unknowingly meting out hardship or torture to elephants in lieu of not practicing them. The least adopted practices for instance were methods to be adopted to reduce the degree of seriousness of impaction once its symptoms are noticed. Precautionary measures while using anguish, methods used to correct small mistakes or mischieves, precautionary measures while canning hind limb, providing enough drinking water, restraining properly during festival performance, footing below six kilometre with the maximum bearable weight,

usage of chains with thickness ½ inch, 5/8 inch or ¼ inch making the animal to carry only less than 500 kg at a stress and procedures to be adopted while it is made to walk a long time during hot weather. These were least adopted probably because knowledge was comparatively less, as indicated by the correlation test.

Imparting proper knowledge and skill based training to owners and mahouts deserves top priority.. Only a first mahout and three second mahouts attended a formal training on scientific elephant management organised under the joint auspices of the forest department and elephant welfare society functioning in Thrissur district and only one of its kind in Kerala. Notably none of the elephant owner was trained formally. The importance of training to mahouts, both inservice and preservice was mentioned in the recommendations drafted by the Government of Kerala as per the provisions of section 64 of the Wildlife Protection Act (1972). Though both owners and mahouts require training, the training need scores indicated the highest need of training to second mahouts followed by first mahouts and owners in that order. As a prelude, all out effort is required to make the mahouts literate. With literacy, this aim would be achieved easily.

Summary

6. SUMMARY

The elephant is considered as Lord Ganapathi in Hindu mythology and hence its significance in the cultural life of Kerala. Captive elephant population in Kerala is reported to be around 600 of which majority are found in the central districts viz., Thrissur, Palakkad and Ernakulam. In Kerala, the captive elephants are mainly used for festivals and draught purposes. They usually are owned by the forest department, temple and individuals.

The elephants are controlled and managed by two mahouts whom are graded as first and second and a third mahout is also not uncommon. The owner do not usually have direct control except in taking decisions like buying elephant, paying the mahouts, renting, veterinary care etc. Elephant keeping forms a livelihood activity for the owners and mahouts and ignorance of proper management could entail untold loss and misery. As in the ease of livestock keeping there should be a periodical assessment of the level of knowledge as well as adoption of scientific practices. This is important to decision making regarding training to the elephant keepers and mahouts. In view of the above facts, the study was conducted among the elephant owners and mahouts with the following objectives.

1. To assess the profile of elephant keepers.

2. To assess the knowledge level of elephant keepers about scientific management of elephants.

3. To study the extent of adoption of scientific management practices in elephant keeping.

A sample of 50 social units each comprising of the elephant owners, first and second mahouts were studied. Thus in all 50 owners and 50 each of first and second mahouts were the respondents. This sample was proportionally drawn from Thrissur and Palakkad districts of Kerala.

The independent variables selected for study were those socio-personal and socio-economic variables pertaining to respondents which consisted of age, sex, caste, experience, marital status, literacy, education, occupation of father, motivation, occupational hazards, concept of elephant, training, land holding, income from job and income from other sources. Elephant owners and mahouts' knowledge of elephant management and adoption of scientific elephant management practices by the first mahouts were studied. The training need of all concerned viz., owners, first and second mahouts were also found out. The data were collected using structured interview schedule. Appropriate statistical methods were used for analysing the data.

The socio-economic profile of the elephant owners as well as the mahouts amply revealed that both were belonging to socio-economically distinct stratum of society. While the former were socio-economically better of the latter were not so. It was as if there were no other sources of livelihood to mahouts that they opted this job. Mahouts were mostly illiterates and even one-fifth children of mahouts themselves. It was a risky job as most of them contracted injuries from the elephants. Except for a negligible percentage of mahouts none had a formal training on elephant management.

Majority of elephant owners had either medium or low knowledge of elephant management. Comparatively, owners had more knowledge of disease management than either harness or general management. Between the individual and institutional elephant owner's knowledge of elephant management there was no significant difference. The ten most known and least known elephant management practices to the elephant owners were identified. Their increased knowledge of disease management might be a consequence of their realisation of the risk and loss due to diseases. The least known practices revealed the chances of overburdening of the elephant since an ignorant owner might not be able to properly guide his mahouts. The importance of age and experience to acquisition of knowledge was amply revealed as age and experience were positively correlated with knowledge of elephant management.

Majority of first mahouts were having either low or medium knowledge of scientific elephant management. They had more knowledge of harness practices than diseased or general management. Ten most known and least known practices to first mahouts were identified. Age and experience was positively correlated with knowledge of management. Majority of the second mahouts also had either low or medium knowledge of elephant management. Ten most known and least known practices to second mahouts were also identified. They had more knowledge of harness than other two domains. There existed a significant positive correlation between age and knowledge of harness practices. The mahout' comparatively higher knowledge of harness might be a consequence of the realisation of their responsibility to control properly the elephant and thereby save the life of the public as well as their own.

Majority of the first mahouts were either low or medium adopters of scientific elephant management practices. The highest adoption was in the domain of the disease management. The experience of first mahouts was significantly correlated with adoption of management practices. The ten most and least adopted practices were identified. Knowledge and adoption were correlated indicating the importance of the former. From the least adopted practices it could be inferred that the elephant might be suffering for that.

The second mahouts had the highest training need followed by first mahouts and elephant owners. The well-being of the elephants can be assured only through a proper knowledge of the scientific practices and their adoption. Hence, all our efforts is required to impart training to the owners and mahouts alike and motivate them to look after the elephants better.

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PROFILE OF ELEPHANT KEEPERS AND OWNERS OF THRISSUR AND PALAKKAD DISTRICTS

By

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ABSTRACT OF A THESIS

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ABSTRACT

The present study was on the profile of elephant keepers and owners of Thrissur and Palakkad districts of Kerala. In all 50 elephant owners and 50 each of first and second mahouts were studied. The socio-economic profile of the elephant owners as well as the mahouts indicated that these categories were representing distinct socio-economic strata of society. While the owners were socio-economically better of the mahouts were not so and were illiterates.

Majority of elephant owners as well as the mahouts had only either medium or low knowledge of elephant management. When owners' had more knowledge of disease management in comparison to other management domains, the mahouts had more knowledge of harness practices. For both owners as well as mahouts the knowledge of general management which included scientific feeding practices, among other practices, was one low. Further majority of the first mahouts were either medium or low adopters of scientific management practices. Age and experience, in general, were found to be important in the acquisition of knowledge as well as adoption of scientific practices. Further, knowledge of scientific management and its adoption were correlated. Information on some of the least known practices to the owners and mahouts revealed the chances of meting out hardship to the elephants unknowingly. Among the owners, first and

second mahouts, training need of second mahouts was relatively more than that of first mahouts and their training need was more than that of owners. Only through a proper knowledge of the scientific practices and practicing of the same that the welfare of the captive elephants can be assured. Therefore, intensive efforts are required to formally train the elephant owners and mahouts. Appropriate training programmes can motivate the owners and mahouts to look after their elephants better thereby assuring their welfare.

Appendices

APPENDIX – 1

PROFILE OF ELEPHANT KEEPERS AND OWNERS OF THRISSUR AND PALAKKAD DISTRICTS

INTERVIEW SCHEDULE (MAHOUTS)

1. Name :
2. Address :
3. Age : Years
4. Married/Bachelor :
5. Religion :
6. Caste :
7. Land owned : Cents
8. Father's Occupation :
9. Elephant owner/First mahout/Second mahout:
10. Name of elephant associated :
11. Why did you select this occupation

    1. Father's occupation
    2. Personal interest
    3. Others ..... (Please mention)

12. Educational qualification

(A) 1. Knows to read and write

2. Knows to read only

3. Knows neither writing, nor reading

(B) 1. LP ☐ 2. UP ☐ 3. HS ☐ 4. PDC ☐ 5. Degree ☐ 6. Others ☐

13. No. of children:

Male:

Female:

14. Experience in the fields: ..... years
15. Have you attended any training on scientific elephant management?

Yes/No

If Yes who has organised it

Ans:

16. Approximate monthly income from this occupation

Type of work	Salary	DA	Work/other allowance	Other income
Elephant pageantry				
Timber mill				
Forest				
Others				

17. Any other sources of income? Yes/No

If yes what is the source?

Ans: _____

What is the annual income?

Ans: Rs. _____

18. 1. Have you ever met with accidents in this job? Yes/No

2. If yes, how?

19. What is your concept about elephant?

1. God Ganapathy ☐ 2. Co-being ☐

3. Animal companion ☐ 4. Others ☐

20. Do you get enough of rest between festivals and other works?

Yes/No

21. Do elephants get enough of rest?

Yes/No

KNOWLEDGE IN DISEASE MANAGEMENT (MAHOUTS)

1. Signs of musth in elephants

1. Swelling/Enlargement of temporal fossa	Yes/No
2. Fowl smelling discharge from temporal fossa	1/0
3. Swelling of back	1/0
4. Penis droops out and strikes abdomen	1/0
5. Elephant becomes disobedient	1/0
6. Elephant becomes aggressive	1/0
7. Urine trickle down without penis outside	1/0

2. Feeding of elephants in musth

1. Give plenty of feed	1/0

2. Give plenty of water 1/0

3. Cool the elephant intermittently 1/0

3. Age of first musth period in an elephant

Answer: (20-25 years) 1/0

4. Signs of disease in an elephant?

1. Will not pour mud and sand over the body 1/0

2. Dry skin 1/0

3. Will not take in food and water 1/0

5. Signs of impaction?

1. No faecal outgo 1/0

2. Won't take in feed and water 1/0

6. Causes of impaction?

1. Bath in cool water when body is hot 1/0

7. The most common health problems in elephant during festival season

1. Impaction 1/0

8. Precautions to reduce severity of impaction

1. Don't move the elephant after confirmation of disease 1/0

2. Don't make it work/walk for long 1/0

3. Provide large quantity of drinking water 1/0

4. Provide expert treatment 1/0

9. Techniques of first aid for wounds in elephants

1. Clean the wound using solutions like 'dettol' and apply medicinal powders on the wound 1/0

10. Symptoms of water deficiency in elephants

1. Cream in urine 1/0

2. White flakes in urinated areas 1/0

KNOWLEDGE TEST – HARNESS (MAHOUTS)

1.	Care and control of elephants during musth	T/F
	1. Check the strength of chain used during the term	1/0
	2. To avoid chain made wounds, change the placement of chain using	1/0
	3. More than 2 feet spacing between the tree and the elephant	1/0
	4. Tie using chains, the fore and hind limbs	
2.	Precautions while taking out elephant immediately after musth	
	1. Mahout should be alert over each and every movement	1/0
	2. Put belly chain during walk	1/0
	3. During the festival pageantry, fore and hind limb tie should be put	1/0
3.	Methods of controlling and managing elephants in musth	
	1. Chain it as soon as signs of musth are seen	1/0
	2. Put separate chains on fore and hind limbs	1/0
	3. While chaining hind limb, provision should be given for removing faeces from back	1/0
	4. Give plenty of water and wet the animal frequently	1/0
4.	Methods to be adopted to put down violence during musth	
	1. Won't give enough of food and water	0/1
	2. Cause infection in the animal by making injuries	0/1
5.	Precautions to be taken by mahouts while experts make use of capture gun to immobilise the elephant	
	1. Be alert as elephant turns around, once shooted	1/0
	2. Call the elephant and divert the attention if it turns around	1/0
	3. Mahout should occupy a safe place, while trying to divert the attention of elephant	1/0
	4. Restrain immediately, once it becomes tranquilized	1/0
6.	Different types of commands	Yes/No
	1. Patting, trapping	1/0
	2. Oral type/by sound	1/0
7.	Necessity of carrying weapons while approaching the elephant	1/0

8. Regions of elephants body where mahouts can stick safely

1. _____	(forelimb)	1/0
2. _____	(hind limb)	1/0
3. _____	(Back)	1/0
4. _____	(thigh)	1/0
5. _____	(upper surface of nails)	1/0
6. _____	(abdominal folds)	1/0
7. _____	(sinus)	1/0

9. Precautions to be taken while using ankush

1. Area shouldn't be danger prone 1/0
2. Leave the sensitive points

10. How to tie the elephant using belly chain?

1. Put chain around the body and tie at the hind limbs 1/0

11. Method of controlling/securing elephant using belly chain

1. Secure the fore limbs 1/0
2. Hook the ring of the chain, and fix it 1/0
3. See that elephant doesn't loosen the knot

12. Precautions by mahouts at the line of performance in temple

1. Lock the limbs 1/0
2. Mahout should hold the right tusk 1/0
3. Pat the elephant during fire works

KNOWLEDGE OF GENERAL MANAGEMENT (MAHOUTS)

1. To correct the mischieves of elephants T/F
   1. Punishments 0/1
   2. Advices 1/0
   3. Pleasing food 1/0
2. Necessity for appreciating the elephant for obedience 1/0
3. Signs of a good elephant
   1. Central depression between raised domes 1/0
   2. Floored and crowing trunk 1/0
   3. Broad forehead 1/0
   4. Wide ears, without patches and scars which touch the forehead on moving 1/0

5. Lean tusks which bend forward and upward 1/0

6. Short neck 1/0

7. Tail that reaches below ankles which has lots of fibre at the tip 1/0

8. 18-20 nails 1/0

4. Methods of knowing aged elephants from external appearance

1. Upper part of ears scroll forward 1/0

2. Lean fore and hind limbs 1/0

3. Emaciated cheeks 1/0

4. Skin colour fades off 1/0

5. Wear and tear of teeth 1/0

5. Green palm leaves requirement for an adult elephant (approx.) per day

Answer: _____ (150-250 kilo) 1/0

6. Water requirement (approx.) for an adult elephant per day

Answer: _____ (250 litre) 1/0

7. Maximum distance an elephant can walk per day in a favourable weather

Answer: _____ (30-40 km) 1/0

8. Most ideal time of the day for taking the elephant on foot

1. Morning 1/0

2. At noon 0/1

3. Evening 1/0

4. At night 0/1

9. Maximum time an elephant can put to work/day

Answer: _____ (6 hours) 1/0

10. Method of knowing tiredness of elephant

1. Pale sole of palm and mouth

2. Elephant blows air out

3. Keeps its mouth open

4. Others

11. Number of methods of mounting on elephant

Answer: _____ (8) 1/0

12. Different methods of mounting on elephant

1. Through the hind limbs 1/0

2. Through the fore limbs 1/0

3. Through the ears 1/0

4. Through the forehead, holding the tusk 1/0

13. Different methods of dismounting from an elephant

1. Through the hind limbs 1/0

2. Through the fore limbs 1/0

3. Through the ears 1/0

14. Maximum length to which the tusk can be cut

Ans. _____ 1/0

(from the angle to eye the of the tusk)

15. Skills and practices in which elephant mahouts should have basic knowledge

1. Climb on palms/coconuts tree 1/0

2. Arranging palm leaves 1/0

3. Compute ration for the elephant 1/0

4. To trim coconut husk 1/0

5. To bathe/dust 1/0

6. To detect diseases 1/0

7. To make indigenous medicine 1/0

8. To swim 1/0

9. To distinguish the edible plants/foods for elephant 1/0

10. To give leg commands 1/0

11. Know the commands 1/0

12. Know the ways of pageantry 1/0

13. Know the vital spots 1/0

14. Know to use and stick 1/0

15. To fix the belly chain 1/0

16. Precautions to be taken while taking elephant among public

1. Note the mischief of elephants 1/0

2. Don't allow the animal to take food from neighbouring shops 1/0

3. Prevent it chasing cock, clogete 1/0

4. See that the elephant won't step on the people beside 1/0

5. Take care of the electric posts and wall 1/0

17. Precautions to be taken while riding elephant

1. Take care the low lying electric lines and branches 1/0
2. Control the elephant at those places 1/0
3. Thorns and fragile slabs shouldn't be on the elephants way 1/0

18. Different methods of sitting on the elephant
    1. Insert legs then the neck rope of elephant 1/0
    2. Bend one leg and extend the other 1/0
    3. Extending the legs and bending the knees, on either sides of back bone 1/0
    4. With one knee fixed and the other leg extended 1/0
    5. Both legs bent 1/0
    6. Keep both the knees together 1/0

19. Symptoms of heat in female elephants
    1. Will allow male to mount 1/0
    2. Frequent urination 1/0
    3. Swollen vulva 1/0
    4. Viscous fluid discharge from vulva 1/0

20. Methods of determining age of elephants
    Ans: _____
    (Ridges on the teeth/depending on wear and tear) 1/0

21. Measures to protect the sole of foot of elephant while performance in hot season
    1. Put wet sack beneath the feet of elephant 1/0
    2. Wet the area in which the elephant stands 1/0

PROFILE OF ELEPHANT OWNERS

1. Name: Address:
2. Owner/Manager: Name of elephant:
3. Main occupation
4. Total number of elephants possessed Age: M/F
5. Father's occupation Owned land:---------- cent
6. Religion/caste
7. Number of members in family

8. Reason for choosing elephant rearing

9. Other sources of income

Family members	Occupation/land/others	Approximate monthly income

10. Experience

11. Educational qualifications

(A) LP ☐ (B) UP ☐ (C) HS ☐ (D) PDC ☐

(E) Degree ☐ (F) Others ☐

12. Approximate income obtained last year from elephant/elephants

Work	Rent	Other
Timber mill Forest Festivals Others		

KNOWLEDGE OF DISEASES MANAGEMENT (OWNERS)

1.	Signs of musth in elephants	T/F
	1. Swelling of temporal fossa	1/0
	2. Foul swelling discharge from temporal fossa	1/0
	3. Swelling of back	1/0
	4. Penis droops out and strikes the abdomen	1/0
	5. Animal becomes frustrated and disobedient	1/0
	6. Animal becomes aggressive	1/0
	7. Urine trickle down without penis outside	1/0
2.	Feeding of elephant during musth period	
	1. Give much feed	1/0
	2. Give much water	1/0
	3. Cool the elephant intermittently	1/0
3.	Approximate age of elephant when it start showing musth	
	Ans: _____ (20-25 years)	1/0

4. Signs of disease in an elephant

   1. Won't move the tail and ears 1/0
   2. Won't pour sand and soil over the body 1/0
   3. Won't take in food and water 1/0
   4. Droopiness 1/0

5. General signs of impaction

   1. No faecal outgo 1/0
   2. Frequent lying down and setting up 1/0
   3. Won't take in feed and water 1/0

6. Reason for impaction in your opinion

   1. Restless work 1/0
   2. Bath in cool water when body is hot 1/0

7. Methods to determine health of elephants

   1. *Good vision* 1/0
   2. Clear eyes without obstruction 1/0
   3. Will move ears and tail 1/0
   4. Take in food as per requirement 1/0
   5. Clear faeces and urine 1/0
   6. No difficulty in walking, lying down and getting up 1/0
   7. Straight fore limbs 1/0
   8. No pus in the base of the tusk 1/0

8. Common diseases in elephants during festival performance season

   1. Stomach pain 1/0
   2. Lacrimation from the eye 1/0
   3. Edema in saddle space 1/0

9. Methods of reducing incidence of disease in festival season

   1. Restorative treatment before festival season 1/0
   2. Musth/ diseased elephants 1/0
   3. Give rest between 2 festivals 1/0
   4. Provide enough of food, water and rest 1/0
   5. Use minimum chains during walk 1/0

10. Methods to lessen the severity of impaction

    1. Don't move the elephant after confirmation disease 1/0

2. Don't make it work/walk for long 1/0

3. Provide plenty of drinking water 1/0

4. Provide expert treatment 1/0

11. Causes of foot rot in elephant

1. *Unhygienic floors and tying spaces* 1/0

2. Staying over mud, urine/faeces for a prolonged period 1/0

KNOWLEDGE OF HARNESS (OWNER)

1. Methods to be adopted in securing the elephant during musth T/F

1. Check the strength of chain used during the term 1/0

2. Change the placement of chain using to avoid chain made wounds 1/0

3. Use the chain with rotating rings 1/0

4. More chain 2 feet spacing between the animal and tree 1/0

5. Tie using chains, the fore hind limbs 1/0

2. Precautionary measures to be taken by mahouts while taking out elephants after musth period

1. Mahout should be alert over every movement of the animal 1/0

2. Belly chain should be put during walk 1/0

3. During the festival performance fore and hind limb ties should be put 1/0

3. Care and control of elephants in musth

1. Chain it as soon as signs of musth are seen 1/0

2. Put separate chains on fore and hind limbs 1/0

3. While chaining hind limb, provision should be given for removing faeces from back 1/0

4. Give plenty of water and wet the animal continuously 1/0

4. Thickness of the commonly used chain rings

Ans: _____ (1/2" 5/8" 3/4") 1/0

5. Normal length of the belly chain

Ans: _____ (Belly chain 21 feet) 1/0

6. Normal length of the neck rope

Ans: _____ (21 feet) 1/0

7. How to use chain in mischievous and elephants in musth

1. Secure the fore limbs 1/0
2. Hook the ring of the chain and fix it 1/0
3. See that the elephant doesn't loosen the knot 1/0

KNOWLEDGE OF GENERAL MANAGEMENT (OWNERS)

1. Signs of a good elephant T/F
   1. Central depression between domes 1/0
   2. Floored and crawling trunk 1/0
   3. Broad forehead 1/0
   4. Wide ears, without patches and rears which touch the forehead on moving 1/0
   5. Lean tusks which bend forward and upward 1/0
   6. Short neck 1/0
   7. Tail that reaches below ankles which has lots of hairs at the tip 1/0
   8. 18-20 nails 1/0
   9. Long limbs 1/0
2. Methods of knowing aged elephant from external appearance
   1. Upper part of ears scroll forward 1/0
   2. Loss obese fore and hind limbs 1/0
   3. Emaciated cheeks 1/0
   4. Skin colour fades off 1/0
   5. Wear and tear of teeth 1/0
3. Green palm leaves requirement (approx) for an adult elephant per day
   Answer: _____ (150-250 kilo) 1/0
4. Water requirement (approx) for an adult elephant per day
   Answer: _____ (250 litre) 1/0
5. Maximum distance an elephant can walk per day in a favourable weather
   Answer: _____ (30-40 km) 1/0
6. Most ideal time of the day for taking the elephant on foot
   1. Morning 1/0
   2. At noon 0/1
   3. Evening 1/0
   4. At night 0/1

7. Most ideal age to start training the elephants to carry logs

   Ans: _____ (5 years) 1/0

8. Maximum time an adult elephant can made to work per day

   Ans: _____ (6 hours) 1/0

9. Maximum months for which an elephant can work in a year

   Ans: _____ (8-9 months) 1/0

10. Maximum weight lifted by an adult elephant

    1. Less than ½ a tonne 1/0
    2. Greater than ½ a tonne 0/1

11. Maximum distance which can be walked by the elephant at a stretch carrying ½ a tonne weight

    Ans: _____ (5-6 km) 1/0

12. Age of maturity in elephants

    1. Male: _____ (14-15 years) 1/0
    2. Female: _____ (12-14 years) 1/0

13. Gestation period of a cow elephant

    Ans: _____ (21 months) 1/0

14. Methods to detect tiredness of elephant after world performance in festivals

    1. Pale sole of the palm and mouth 1/0
    2. Elephant blows out 1/0
    3. Keeps its mouth open 1/0

15. Maximum length to which the tusk can be trimmed

    Ans: _____ 1/0

    (from the angle of eye to base of the tusk)

16. Danger if the tusk is trimmed in a wrong way

    Ans: _____ (bone marrow will be cut) 1/0

17. Signs of heat in female elephants

    1. Will allow male to mount 1/0
    2. Frequent urination 1/0
    3. Swollen vulva 1/0
    4. Viscous fluid 1/0
    5. Frequent vagging of tail 1/0

18. Things to be observed at the time of purchase of an elephant

1. Observe whether it allows mahouts to climb along the fore and hind limbs 1/0
2. Whether the animal obeys the leg commands of the mahouts 1/0
3. Whether the animal goes on moving the head and legs even after loosening the chain 1/0
4. Whether there are nails 1/0
5. Whether there are black patches on tongue and palate 1/0

19. Any four ingredients of balanced ration for an adult elephant

1. _____ 1/0
2. _____ 1/0
3. _____ 1/0
4. _____ 1/0

20. Methods to determine the age of elephants

Ans: _____ (Ridges on teeth, wear and tear) 1/0

ADOPTION OF GENERAL MANAGEMENT PRACTICES (FIRST MAHOUTS)

1. Procedures to be adopted while the elephant is made to walk a long time during hot weather
   1. Wetted sac below the limbs 1/0
   2. Wet the space where the elephant stands 1/0
2. Methods used to correct small mistakes and mischieves of elephant
   1. Through good words 1/0
   2. Pleasing food 1/0
3. Methods of congratulating when elephant show obedience
   1. Pleasing words 1/0
   2. Pleasing food 1/0
4. Providing at least 150-250 kg palm leaves for an adult elephant/day 1/0
5. Providing at least 250 liters of water/day for an adult elephant 1/0
6. Taking the elephant for not more than 40 km per day in favourable weather 1/0
7. Making the elephant to walk in morning and evening only 1/0
8. Making the elephant to work only for 8-9 months per year 1/0
9. Making the elephant to lift a maximum of ½ a tonne (500 kg) 1/0
10. Making the animal to walk less than 6 km per day with its Maximum bearable weight 1/0
11. Precaution taken while riding the elephant.
    1. Will control the elephant in presence of low-lying branches of trees and electric wires 1/0
    2. Will confirm the absence of thorns and fragile slabs on the way 1/0
12. Methods of selecting resting place for elephants
    1. Less narrow crowded place 1/0
    2. Shady place 1/0
    3. Regular and non-guttered space 1/0
    4. Non-marsh 1/0

ADOPTION OF HARNESS PRACTICES (FIRST MAHOUTS)

1. Methods of restraining elephants in musth
   1. Check the strength of chain even before musth 1/0
   2. Change the placement of chain frequently and thus avoid the chain - wounds 1/0
   3. Use ringed chains 1/0
   4. Provide a spacing of 2 feet between elephant and the tying tree 1/0
2. Control methods adopted while the elephant is taken out after musth 1/0
   1. Alert during every movement of elephant 1/0
   2. Walk it with double chain 1/0
   3. Fore limb and hind limbs locked during festival performance 1/0
3. Methods of giving commands
   1. Patting 1/0
   2. Oral method/by sound
4. Methods of using ankush
   1. Touch only the less danger prone spots 1/0
   2. Avoid the sensitivepoints 1/0
5. Precautionary measures while caning hind limb
   1. Shorten the rod 1/0
   2. Avoid the prepuce 1/0
   3. Won't use stick if animal is exhausted 1/0
6. Usage of chains with thickness of ½ inch, 5/8th of an inch, ¾th of an inch etc. 1/0
7. Usage of belly chain while walking the elephant 1/0
8. Proper restraining methods of mischievous elephants and elephants in musth
   1. Secure the fore limbs 1/0
   2. Hook the ring of chain and fix it 1/0
   3. See that the elephant doesn't loosen the knot 1/0

9. Properly restraining during festival performance
   1. Lock the limbs 1/0

2. Hold the right tusk 1/0

3. Pat it during fire works 1/0

4. Shout and wake it up if the animal dozes off 1/0

ADOPTION OF DISEASE MANAGEMENT PRACTICES (FIRST MAHOUTS)

1. Methods of identifying musth in elephants

   1. Swelling of temporal fossa 1/0

   2. Foul swelling discharge from temporal fossa 1/0

   3. Swelling of back 1/0

   4. Penis comes out 1/0

   5. Masturbation 1/0

   6. Elephant becomes disobedient 1/0

   7. Trickling down of urine 1/0

2. Providing plenty of feed and water during musth 1/0

3. methods of detecting diseases in elephants

   1. Won't move ears, tail and body 1/0

   2. Won't pour soil and sand over the body 1/0

   3. Won't drink/eat 1/0

   4. Droopiness 1/0

4. Signs of impaction usually observed

   1. No faecal outgo 1/0

   2. To become restless 1/0

   3. Frequent lying down and getting up 1/0

   4. Won't drink/eat 1/0

5. Methods to be adopted to reduce the degree of seriousness of impaction once the symptoms are noticed

   1. Won't move the elephant, once the disease is confirmed 1/0

   2. Won't work/walk the elephants for long distance 1/0

   3. Provide plenty of water 1/0

   4. Provide expert treatment 1/0

APPENDIX – 2

Domain-wise knowledge of elephant management to owners and mahouts with their respective mean scores

KNOWLEDGE OF ELEPHANT OWNERS

Sl. No.	Statement	Mean score (Owners)
1	Signs of musth in elephants	79.87*
2	Feeding of elephant during musth period	91.66*
3	Approximate age of elephant when it start showing musth	69.60
4	Signs of disease in an elephant	84.00*
5	General signs of impaction	84.66*
6	Reason for impaction in your opinion	52.50
7	Methods to determine health of elephants	69.31
8	Common diseases in elephants during festival performance season	27.26**
9	Methods of reducing incidence of disease in festival season	69.00
10	Methods to lessen the severity of impaction	77.25*
11	Causes of foot rot in elephant	60.50
	Knowledge-Harness (owners)	
1	Methods to be adopted in securing the elephant during musth	75.60
2	Precautionary measures to be taken by mahouts while taking out elephants after musth period	76.76*
3	Care and control of elephants in musth	80.25*
4	Thickness of the commonly used chain rings	45.45**
5	Normal length of the belly chain	36.36**
6	Normal length of the neck rope	36.36**
7	How to use chain in mischievous and elephants in musth	59.33
	Knowledge – General management (Owners)	
1	Signs of a good elephant	84.44*
2	Methods of knowing aged elephant from external appearance	61.20
3	Green palm leaves requirement (approx) for an adult elephant per day	78.78*
4	Water requirement (approx) for an adult elephant per day	45.45**
5	Maximum distance an elephant can walk per day in a favourable weather	72.70
6	Most ideal time of the day for taking the elephant on foot	71.75
7	Most ideal age to start training the elephants to carry	24.20**

	logs	
8	Maximum time an adult elephant can made to work per day	69.60
9	Maximum months for which an elephant can work in a year	66.60
10	Maximum weight lifted by an adult elephant	48.00**
11	Maximum distance which can be walked by the elephant at a stretch carrying ½ a tonne weight	45.40**
12	Age of maturity in elephants	56.06
13	Gestation period of a cow elephant	42.40**
14	Methods to detect tiredness of elephant after world performance in festivals	67.66
15	Maximum length to which the tusk can be trimmed	69.60
16	Danger if the tusk is trimmed in a wrong way	54.50
17	Signs of heat in female elephants	25.44**
18	Things to be observed at the time of purchase of an elephant	73.20
19	Any four ingredients of balanced ration for an adult elephant	76.40*
20	Methods to determine the age of elephants	27.00**

KNOWLEDGE IN DISEASE MANAGEMENT (MAHOUTS)

Sl. No.	Statements	Mean scores	
		First mahout	Second mahout
1	Signs of musth in elephants	85.00*	73.57
2	Feeding of elephants in musth	88.00*	81.008
3	Age of first musth period in an elephant	71.10	31.00
4	Signs of disease in an elephant	63.33	57.00
5	Signs of impaction	91.00	87.50*
6	Causes of impaction	86.60	56.20
7	The most common health problems in elephant during festival season	91.10	43.00
8	Precautions to reduce severity of impaction	73.75	53.00
9	Techniques of first aid for wounds in elephants	20.00**	43.00
10	Symptoms of water deficiency in elephants	26.65**	17.15**
	Knowledge – Harness		
1	Care and control of elephants during musth	81.50	71.07
2	Precautions while taking out elephant immediately after musth	88.66*	80.00*
3	Methods of controlling and managing elephants in musth	88.75*	80.25*
4	Methods to be adopted to put down violence during musth	83.00	89*
5	Precautions to be taken by mahouts while experts make use of capture gun to immobilise the elephant	33.75**	37.50

6	Different types of commands	94.00*	96.50*
7	Necessity of carrying weapons while approaching the elephant	80.00	46.00**
8	Regions of elephants body where mahouts can stick safely	55.14	61.14
9	Precautions to be taken while using ankush	81.00	56.00
10	How to tie the elephant using belly chain	91.10*	96.00*
11	Method of controlling/securing elephant using belly chain	91.00*	79.00
12	Precautions by mahouts at the line of performance in temple	60.66	37.50**
	Knowledge – General management		
1	To correct the mischieves of elephants	69.33	52.00
2	Necessity for appreciating the elephant for obedience	91.11*	87.00*
3	Signs of a good elephant	73.25	55.75
4	Methods of knowing aged elephants from external appearance	23.00**	36.20**
5	Green palm leaves requirement for an adult elephant (approx.) per day	66.60	62.00
6	Water requirement (approx.) for an adult elephant per day	40.00**	37.00**
7	Maximum distance an elephant can walk per day in a favourable weather	57.75	71.00
8	Most ideal time of the day for taking the elephant on foot	83.75	82.50*
9	Maximum time an elephant can put to work/day	44.40**	40.00**
10	Method of knowing tiredness of elephant	50.50	55.22
11	Number of methods of mounting on elephant	15.50**	25.00**
12	Different methods of mounting on elephant	65.50	69.50*
13	Different methods of dismounting from an elephant	85.00	79.00
14	Maximum length to which the tusk can be cut	77.70	56.00
15	Skills and practices in which elephant mahouts should have basic knowledge	86.80	80.80*
16	Precautions to be taken while taking elephant among public	72.40	60.60
17	Precautions to be taken while riding elephant	89.33*	79.00
18	Different methods of sitting on the elephant	17.33**	27.00**
19	Symptoms of heat in female elephants	32.00**	30.25**
20	Methods of determining age of elephants	9.80**	37.00
21	Measures to protect the sole of foot of elephant while performance in hot season	43.00**	43.50

* Most known elephant management practices to the owners and mahouts

** Least known elephant management practices to the owners and mahouts

APPENDIX - 3

Domain-wise adoption of scientific management practices by first mahout and their respective mean scores

ADOPTION OF GENERAL MANAGEMENT PRACTICES (FIRST MAHOUTS)

Sl. No.	Statement	Mean score
1	Procedures to be adopted while the elephant is made to walk a long time during hot weather	21.50**
2	Methods used to correct small mistakes and mischieves of elephant	73.00
3	Methods of congratulating when elephant show obedience	80.00
4	Providing at least 150-250 kg palm leaves for an adult elephant/day	76.50
5	Providing at least 250 liters of water/day for an adult elephant	67.30**
6	Taking the elephant for not more than 40 km per day in favourable weather	84.70*
7	Making the elephant to walk in morning and evening only	95.70*
8	Making the elephant to work only for 8-9 months per year	79.10
9	Making the elephant to lift a maximum of ½ a tonne (500 kg)	36.17**
10	Making to walk below 6 km with the maximum weight it can bear	53.19**
11	Precaution taken while riding the elephant.	92.50*
12	Methods of selecting resting place for elephants	81.75
	Adoption – Harness (First mahouts)	
1	Methods of restraining elephants in musth	84.75*
2	Control methods adopted while the elephant is taken out after musth	84.66*
3	Methods of giving commands	87.50*
4	Methods of using ankush	75.00**
5	Precautionary measures while caning hind limb	71.00**
6	Usage of chains with thickness of ½ inch, 5/8th of an inch, ¾th of an inch etc.	50.00**
7	Usage of belly chain while walking the elephant	97.80*
8	Proper restraining methods of mischievous elephants and elephants in musth	94.66*
9	Properly restraining during festival performance	65.00**

	Adoption – Disease management (First mahouts)	
1	Methods of identifying musth in elephants	83.71
2	Providing plenty of feed and water during musth	95.60*
3	Methods of detecting diseases in elephants	80.75
4	Signs of impaction usually observed	85.25*
5	Methods to be adopted to reduce the degree of seriousness of impaction once the symptoms are noticed	76.00**

* Most adopted elephant management practices by the first mahouts

** Least adopted elephant management practices by the first mahouts