



People's Perception On Human-Elephant Conflicts In Gudalur Forest Division, Tamilnadu

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Abstract

Human-Elephant Conflict (HEC) becomes a serious issue in all elephant ranges. The elephant population is building up when compared to past few decades due various management implications made by the Tamil Nadu Forest Department. Thus resulted various human-elephant conflict issues such as human injuries and deaths, loss of properties and crops and deaths of elephants, etc. During such forays, managing elephant population is purely depending on local people as they lives many years. Hence, considering the importance, this short term study was attempted in order to understand people's mind set on elephant conservation in the Gudalur Forest Division. This study was carried from January to March 2013 and the objectives of the project were a) To estimate socio-economic status of local people, b) To understand mind set of the local people elephant and its conservation Problems, c) To record solution to mitigate human-elephant conflict issues, d) To document various mitigating measures used by the local people against human-elephant conflicts. Questionnaire survey was used to identify various human-elephant conflict mitigating measures displayed by the local people. 200 people were interviewed during the present investigation. The questionnaire was designed to evaluate factor such as frequency of elephant visits, and data was collected from various agricultural field persons (n=200) including children's and parents. The questionnaire survey method was done in 16 villages was covered namely to Bennai (n=17), Pitharkaadu (n=16), Silver cloud estate, Oovelly and Paadanthorai (n=15), Dhevalai, (n=16), Moolakadu estate (n=10), Yellamalai estate (n=18), Neermattam, Erumaadu (n=10) (2×10=20), Keel Naadukani (n=16), Soondy, Gandhinagar, Cherampady (n=7) (3×7=21), Kolapalli (n=15), Naadukani (n=8). Variables such as name, occupation, years of living data were collected. Most of the people (n=110) opined that the elephant visits were became high in the past 5 years. 121 people were told that all the visits were made by the elephants only during night times.

Keywords: Human-Elephant, Conflict, Nilgiris, Agriculture.

Introduction

Asian elephant (*Elephas maximus*) is an 'endangered' species (IUCN Red List, 2008), about 6000 years ago, enjoyed a much wider geographic distribution and higher number than it does today. Its range then extended from Mesopotamia in the west across the Indian subcontinent to Southeast Asia and China, as far north at least as the Yangtze-King (Santiapillai and Sukumar 2006). Today there are about 30000–50000

elephants distributed discontinuously across 13 range countries (Hedges, 2006). The range countries population varies from perhaps less than 100 in Vietnam to well over 24,500 elephants India (Santiapillai and Sukumar, 2006). The 2007 elephant population estimation in India shows that 27,694 elephant & (ranges from 27669 to 27719) with largest populations are regionally seen in southern India

(Project elephant, 2009). Asian Elephants are distributed about thirteen Asian countries viz. Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Myanmar, Malaysia, Nepal, Sri Lanka, Thailand and Viet Nam. The world population is about 47000-80000 (Sukumar, 2001). India is holding 27000-29000. Which is about 50% of the world population similarly the Southern India is holding 50% of the Indian population about 14000-17000. The South India population especially the Nilgiris and Eastern Ghats (NEG) in holding single Asian elephant population in the world. About 6000-6500 elephants living in 120000 sq. km area of NEG landscape. Still the habitat is intact because of the connectivity of many crucial corridors. Conservation of this population is viable is order secure the single larger Asian elephant population of the world.

Asian elephant, a wide-ranging mega herbivore, is highly affected by fragmentation and degradation of habitat, large-scale capture for captivity and poaching for ivory (Daniel, 1980; Sukumar, 1989). With natural habitats traditionally used by elephants, continuing to drop, fragment and degrade by increasing human population and its pressure, a large number of elephants come in contact with humans leading to increase in human–elephant conflict (Santiapillai and Jackson, 1990; Balasubramanian et al., 1995, Desai and Baskaran, 1995; Baskaran et al., 2007). A continental study on the evaluation of Asian elephant habitats (Leimgruber et al., 2003) states that only 51% of the geographic range (estimated at < 5,00,000 by Sukumar 2003) of Asian elephants consisted of unfragmented wild lands in India during 1990. which holds the largest Asian elephant population in the wild, has ongoing developmental activities in all the elephant ranges with the exception of a part of the northeastern region (Leimgruber et al., 2003). However, the affected communities feel the ex-gratia payment is negligible given the magnitude of conflict and its adverse impact on their socio-economic status. Therefore, goodwill and tolerance level is decreasing among the affected people over time that could lead to animosity towards the elephant conservation (Madhusudan, 2003; Boominathan et al., 2008). An average of 41 elephants died annually due to human–elephant conflict with poisoning, taking the major share (25) followed by electrocution (16) (Bist, 2002). The intensity increased during 2002–03 as 53 elephants died due to electrocution and poisoning across India (Project Elephant, 2009) accounting for 36% of total elephant mortality recorded during that period. Worldwide the conservation programmes and policies affirm that conservation goals cannot make

poor people poorer and that poor people cannot be expected to bear disproportionate costs of conservation (Walpole et al., 2006). Smallholder subsistence farmers are least able to withstand the risks posed by human–elephant conflict (Nath and Sukumar 1998). Since the human–elephant conflict is posing a major challenge to the conservation of Asian elephant, resolving human–elephant conflict is the major concern among the conservation community (Tchamba, 1996; Hedges, 2006). The human–elephant conflict includes crop damage, human casualties, house, and other infrastructure damage by elephants and elephant mortality by human (Barua and Bist, 1995; Sukumar, 1989; Balasubramanian et al., 1993; Zhang and Wang 2003). The elephants ranging in such suboptimal habitats unable to meet their fodder requirements resort to crop raiding by staying on in their traditional ranges or moving into new areas (without or with less elephant occupation) if the new areas are too unable to meet their demands (Baskaran, 1998; Daniel et al., 2006). In recent years, elephants from northern Karnataka (Belgaum) have strayed into adjoining forest divisions of Maharashtra and Goa states, causing considerable damages to crops and properties. The reason for such straying could be biotic pressure and its impact on their traditional ranges (Koehl, 2006). The elephants ranging further south on Karnataka–Tamil Nadu border (Elephant Range No 7: The Nilgiris–Eastern Ghats) also follow a similar pattern. There have been incidences of elephant herds straying out, due to degradation and fragmentation of traditional areas.

The Gudalur forest Division is an elephant habitat for the population of resident elephants and as well as for the migratory elephants. When compared to other elephant forest division in the Nilgiris, the Gudalur forest division is highly fragmented landscape. Therefore it is important to know people's perception on human elephant conflicts. Without their help it would be a difficult task for the manage this forest division. So for none of the studies were attempted in the Gudalur Forest Division except Prabakaran (1986), Ramakrishnan (1997). Both the studies were mainly concentrated an hied oriented issues. Therefore this short them studies was attempted especially understanding people's mind set on HEC with the following major objectives. To estimate socio economic status of local people. To understand mind set of the local people on elephants and its conservation problems. To record solutions to mitigate human – elephant conflict issues. To document various mitigating measures used by the local people against human –elephant conflicts.

Study Area

The total area of Gudalur and neighboring of Pandalur is approximately 124,800 acres. Gudalur is a picturesque green valley on the way from Mysore to ooty with a population of 32,605 people (census 1991). It's gateway to three states, Tamil Nadu, and Kerala. It is the place where all three borders meet therefore this place is called Gudalur. Even though it says it takes its name from Gudalur Koodal ++ uru uru= Goodale but mysterious place. Ooty coonoor and kotagiri lies in the upper plateau of Nilgiri and Gudalur lies in lower plateau, it is the headquarter of the Taluk and lies about 51 kms, west of Udthagamandalam below the Ghats at an elevations of 1,180 mtrs above MSC on the way to Mysore. Most of the Gudalur area is green carpeted.

The plantations point the whole region, and the regional economy is heavily dependent on industry. This is a place rich in flora and fauna with a variety of plants and trees from the hills of the lower level, such as rice, nuts, coconut etc. This country was a descendant of the survey conducted by the British during the independence period to cultivate tea plantations. Several large companies have their own tea plantations in this regions. Gudalur was part of the "Malabar Taluk" and was owned by the Janmies Malayalam, Malabar hilly areas. These hills were inhabited by tribes, tribal and other seeds. The language spoken by these people were called Malayalam. The tribes of the region are mainly Paniyas where languages is 90% Malayalam. Wayanad Chetties, Chetties mountadan and semi tribes in this area and chetties Eayanadan speak Malayalam. All the others spoke Malayalam in 1977. But this area has been incorrectly part of Tamil Nadu, state re organization (1956) based on they language spoken in the area. Tamil was the language of this area also need 1977 ciation. Gudalur Taluk is only a law promulgated by The state government of Tamil Nadu and is place ninth (9TH) in the program of the constitution India (entry 80). Made exclusively for the region Gudalur. This law is Gudalur Janmam Abolition Act of 1969 law (24/69). Gudalur Mudumalai Tiger Reserve borders and many wild animals like elephants, tigers, deer, bears, wild pigs, and etc...

Climate conditions:

Gudalur board MTR on North Nilambur on South, Wayanad on West and Nilgiri hills an east rang the average rainfall 2300 mm per annum. While 75% of

the rain is received during the South West monsoon, (June to August) and Northeast monsoon (October to November) contribution of North east monsoon is only 15% to the total of rainfall and 80% of the rains are received during the hot weather and 2% during the winter.

Maximum temperature (c°) ranges between 19 c° and 30 c°

Minimum temperature (c°) ranges between 7 c° and 20 c°

The percentage of relative is ranging between 70 % and 82 %.

The weather is mainly dry during January – March and the moisture content gradually increases due to the influence of south west monsoon.

Soil conditions:

The wide occurrence of charnokite or of Nilgiris gneiss rocks are acid one. True peat forms in the hollows on the Nilgiris due to the growth and decompositions of mass as in temperate climate.

Physical constituents:

Gudalur plateau attributes different types of soils. Such as

| | |
|-----------------------|----------------|
| Sand | (45.8%) |
| Silt | (12.4%) |
| Clay | (34.8%) |
| Organic carbon | (0.7 %) |
| pH | (4.5) |

The climate conditions of Gudalur division is well suited for growing forest subtropical and temperate crops. The upland (slope) are ideal for growing plantations crops like tea, coffee, rubber, spices crops like pepper, cardamom, ginger, clove, nutmeg and tuber crops like tapioca etc... In valleys, crops like paddy, banana, ginger, sugarcane are being cultivated. The other horticulture crops grown are mandarin orange, arecanut, coconut, guava, lime, cashew and mango here and there of late in the Rice fallows cultivation of tropical Vegetables, Banana are gaining importance, pepper forms a major component in the multitier cropping in tea and coffee plantations.

Methodology

The questionnaire comprised both “Precise and closed and broad and open ended” questions. First and second objectives were collected through a rapid questionnaire Survey. A model questionnaire attached in the Annexure - . 200 people were interviewed of with the samples of farmers (n=50), shopkeepers (n=21), field workers (n=2), coolies (n=92), anti-poaching watchers (n=1), Business peoples (n=1), drivers (n=5), educators (n=19), teachers (n=1) and others (n=8) from selected villages in Gudalur Forest Division. Human elephant conflict details such as frequency of elephant visits, number of farmers applied for compensation and paid, etc were collected.

The questionnaire was conducted from 200 people comprising two sets of questions, i, e name, occupation, how long lived in the village, status of forest/vegetation over the year, why elephants visits the villages, how long elephants visiting the villages, why to avoid elephants, and etc. were collected by using “Precise and closed method” from to Bennai (n=17), Pitharkaadu (n=16), 15 people were interviewed from the following villages, such as Silver cloud estate, Oovalley and Paadanthorai (n=15), 16 people were interviewed from the following villages

such as Dhevalai, (n=16), Moolakadu estate (n=16), Yellamalai estate (n=10), 10 people were interviewed from the following village Neermattam, Erumaadu each (n=10), Keel Naadukani (n=16), Soondy, Gandhinagar, Cherampady each (n=7), Kolapalli (n=15), Naadukani (n=8). This set of questions had asked for direct answers from the respondent (Budolo and Mishra, 1995; Ramakrishnan, 1997; Santurrais *et al.*, 1995).

Second set of information was collected through “Broad and open ended” questions giving the respondent an opportunity to express his views freely without and inhibition (Balakrishnan and Ndhlova, 1992, Ramakrishnan, 2008). Through this method questions such as how to resolve HEC, and coexistence with elephant in were collected.

Results

People living in the selected villages data revealed that most of them (n=151) were living almost entire life in their respective villages. Seize able number (n=44) of people living part of their life in the villages. Very few (n=5) of them living not so long.

Table 1. Ages of people who settled in this place

| No | Life | No of people |
|----|-------------------|--------------|
| 1 | Entire life | 151 |
| 2 | Part of your life | 44 |
| 3 | Not long | 5 |
| | Total | 200 |

Out of 200 people, 153 of them said that forest cover was decreased. On the contrary, 135 people said that agriculture cover was increased. 33 people were opined that forest cover was increased and 54 of them said agriculture was decreased in the past decades. 10

people on forests and 5 persons on agriculture categories suggested that no change. About 10 persons were opined that no idea on forest as well as agriculture status.

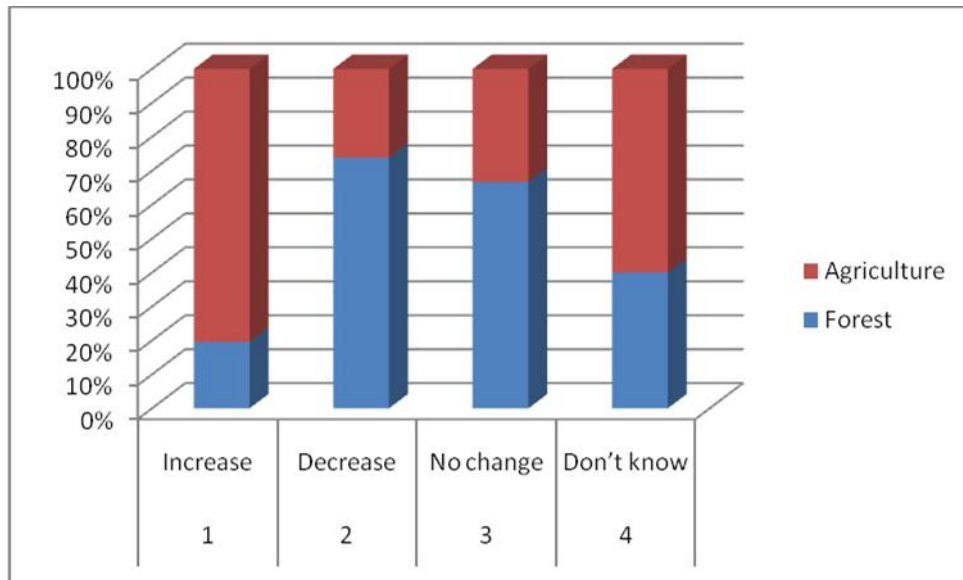


Fig 1. People's perception on forest cover and agriculture status during part decades.

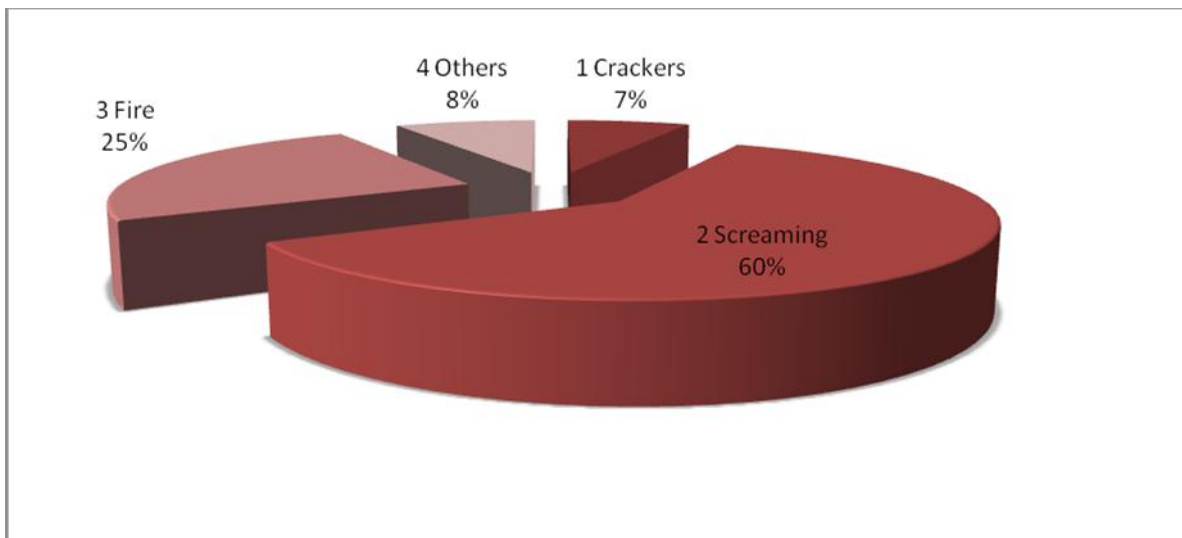


Fig 2. Types of mitigating measures used by the local people against human wildlife conflict

Types of mitigating measures used by the local people against human wildlife conflicts was assessed in target villages. The result found that traditional methods were effectively used by the people against human wildlife conflict issues. Of which screaming was recorded most effective (n=120), method followed by fire (n=50), other methods (n=16) and crackers (n=14).

People's perception on legal aspects for elephant protection was assessed during the survey. The result showed that most of the people were suggested that the elephants can be protected by strong law enforcement (n=103). 97 people were opined that law never helps for the protection of elephants.

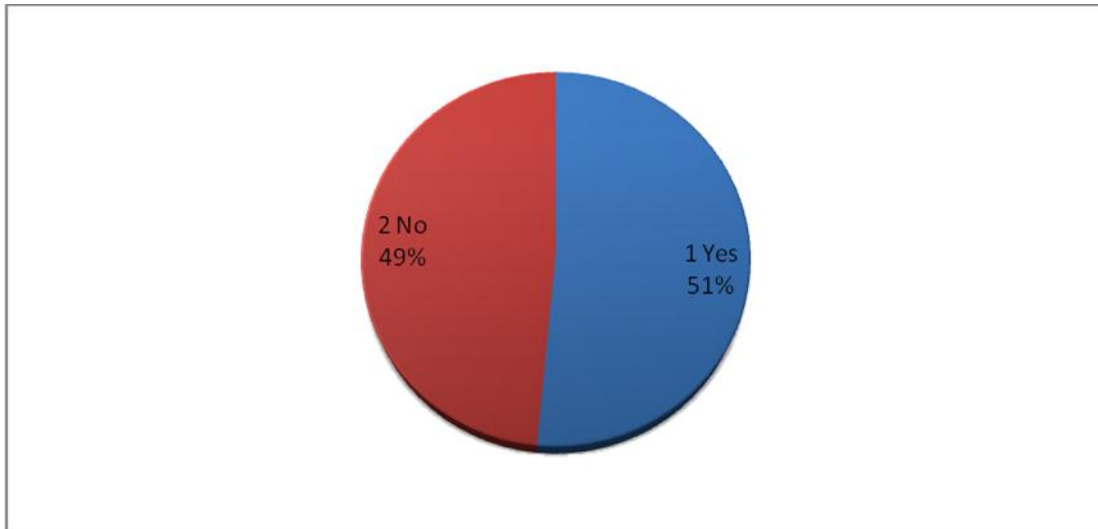


Fig 3. People’s perception on legal aspects for elephant protection

Table 2. The location and number of people who have fled the conflict elephants

| No | No of families moved | No of peoples |
|----|----------------------|---------------|
| 1 | More than 10 | 20 |
| 2 | Less than 10 | 15 |
| 3 | Don’t know | 165 |
| | Total | 200 |

Number of families moved away from their villages due to elephants problem was estimated during the survey. The result showed that 20 peoples opined that more than 10 families had moved away from their villages due to elephant problems. 15 people’s were hold that just less than 10 families had moved away from their villages. But majority of them (n=165) don’t have any idea about the families had moved from the villages due to elephant problem.

Discussion

Of late, management of human-elephant conflict is one of the important challenges to the forest mangers in all elephant ranges. This is mainly due to the habitat preference of elephants for the availability of food, water and shade. These resources vary in space and time, and hence elephants show distinct habitat preferences with changes in season. The movement pattern of elephants is severely hampered by both biotic and abiotic activities and thereby elephants are forced to extend their traditional range and raid crops. During such forays, destruction to properties, killing of humans by elephants and death of elephants by human activities are not uncommon and become a

serious conservation issues in many parts of Africa and Asia. Large-scale conversion of forest areas due to increasing human pressure is the main reason behind for increasing trend of human-elephant conflicts in the plains of the Nilgiri Biosphere Reserve (Ramakrishnan, 2008).

During the recent past, conflicts between man and elephants had escalated throughout their range in Asia (Sukumar and Gadgil, 1988; Santiapillai and Widodo, 1993; Ramesh, 1994; Balasubramanian *et al.*, 1995, de Silva, 1998; Williams *et al.*, 2001; Kumar *et al.*, 2004). It has been reported that there is an increase in the local density of elephants, which is due to strong anti-poaching activities by the forest department. Nevertheless their range has diminished radically due to increase of human induced activities such as indiscriminate growth of various development activities, conversion of many traditional areas for agriculture, etc.,. Sukumar (1991) mentioned that the agriculture was the predominant land use practice resulted for human elephant conflict issues across India. When the interactions between elephants and human beings become very close, undoubtedly there would be a conflict between man and elephant.

Elephants cause crop depredation, and the attacks on human beings leads to injuries, severe wounds and ultimately to death. Besides, the elephants also cause damage to human properties. This has changed the people's mind set towards anti-conservation of elephants. Although elephants are referred as "Keystone Species" (Ramakrishnan and Saravanamuthu, 2008), its conservation become a difficult task to the managers unless local people's participation is ensured. This present study is attempted to understand local people's mind set on elephant conservation in and Gudalur forest division.

Totally 16 number of villages were selected in the Gudalur forest division for this present study. The result showed that out of 16 villages, 12 villages were established about hundred years before. The Gudalur forest division was popularly known as the Nilgiri-Wynaad Plateau (Davidar, 1972), it lies to the west of the Nilgiri hills, forming the south-western extremity of the Mysore plateau. During 1950-1990, rapid changes on the ecology and environment of the Nilgiri-Wynad plateau. The greater polarization between the forces of conservation and development brought different human groups into flash-point conflicts over access to resources, which triggered the rapid changes, were events occurring outside the realm of normal processes within the Nilgiri-Wynaad plateau. These events increased the migration of human groups into the area, and quickened the pace of commercialization and they also heightened conflicts land access among the various contending interests to indigenous groups, the estates and immigrants and state.

Out of 200 people interviewed, 153 of them were said that the forest cover was decreased when compared to past decades in the Gudalur forest division. On the contrary, agriculture cover was increased. Davidar (1972) reported that there were eleven corridors connecting elephants' movement between Sigur plateau and Nilambur forest divisions through Gudalur plateau. Though the elephants live in a variety of landscapes available in India, it has been well studied and conclusively reported that large contiguous areas are either surrounded by crop fields (Sukumar, 1991; Balasubramanian *et al.*, 1995), or very degraded areas with other agricultural encroachments (Datye and Bhagwat, 1995) or fragmented landscape with a mosaic of crop fields. Patches of forests (A. C. Williams and A. J. T. Johnsingh, Wildlife Institute of India. Unpublished Report) are also the influencing factors for crop depredation by elephants. Blair *et al.*, (1979) reported that the increased cultivated area and

human movement in to the elephant habitats are also responsible for crop depredation by elephants.

Most of the people (n=110) opined that the elephant visits were became high in the past 5 years. 121 people were told that all the visits were made by the elephants only during night times. The pattern of crop raiding by elephants and immediate reasons behind on it might vary, but several factors may play a significant role under particular circumstances. Not all elephants in a population raid crops (Balasubramanian *et al.*, 1995). Elephants annually damage crops worth from a few thousand dollars to millions of dollars (A. C. Williams and A. J. T. Johnsingh, Wildlife Institute of India. Unpublished Report; Blair *et al.*, 1979; Sukumar, 1989).

Out of 200 people interviewed, most of them (n=139) opined that not entering elephants into their premises is sad, but they do not ready to move their villages. This was mainly because of the climatic condition as well as income they are getting from estates would not available elsewhere. Similarly most of them (n=135) were opined that they don't want coexistence with either elephants or any other wild animals. This anti-conservation mind set of the people is not an encouraging one for elephant conservation in future in the Gudalur forest division. This is mainly because of habitat fragmentation due to loss of corridors of the Plateau. Management of habitat corridors is highly significant in the context of the conservation of elephants across its ranges in India. Of late, the elephant corridors have been degraded into smaller fragments due to various anthropogenic pressures and developmental activities that are being taking place unabated by closer to corridors (Ramakrishnan, 2008). These activities resulted elephants getting isolated into small pockets and invading into a new ranges, and the low integrity of the habitat induce the rate of human-elephant conflict (Kumar *et al.*, 2004).

Out of 200 people interviewed, 120 of them replied that the most of them use traditional method especially screaming method to drive away the elephants from their premises in and around Gudalur forest division. Most of the authors suggested that the conventional methods such as firecrackers, trip wires that set off explosive crackers and fire bands were used as elephant scaring devices in various parts of the Nilgiri Biosphere Reserve. Bell (1984) and Sukumar (1989) suggested that the community approach of bringing 'front line' farmers closest to elephant refuges. Ramakrishnan (2008) found that one method never yield good result to drive away the elephants. He also

added the combination of various methods along with conventional methods yielded good result in many elephant corridor areas in the Nilgiri Biosphere Reserve.

Solution for the conservation of elephants was interviewed the people in Gudalur forest division areas. The most of the people had opined that the elephant conservation can be strengthening by strong law enforcement. Similarly most of the people mentioned that children to be taught on the importance of elephant conservation. No doubt the conservation status mainly depends on future generation. Therefore continuous awareness campaigns are really needed for the conservation of the pachyderm in this region.

Summary

Asian elephant (*Elephas maximus*) is an 'endangered' species (IUCN Red List, 2008), about 6000 years ago, enjoyed a much wider geographic distribution and higher number than it does today.

Human-Elephant Conflict (HEC) becomes a serious issue in all elephants' ranges. The elephant population is building up when compared to past few decades due various management implications made by the Tamil Nadu Forest Department. On the other hand, habitat is being affected due to various human induced activities such as indiscriminate growth of developments, expansion of human habitation and agriculture, biotic threats. Thus resulted various human-elephant conflict issues such as human injuries and deaths, loss of properties and crops and deaths of elephants, etc. During such forays, managing elephant population is purely depending on local people as they lives many years. Without their cooperation and participation the HEC management would be a difficult task. Therefore considering the importance, this short term study was attempted in order to understand people's mind set on elephant conservation in the Gudalur Forest Division.

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Questionnaire survey was used to identify various human-elephant conflict mitigating measures displayed by the local people. 200 people were interviewed during the present investigation. The questionnaire was designed to evaluate factor such as frequency of elephant visits, and data was collected from various agricultural field persons (n=200) including children's and parents. The questionnaire survey method was done in 16 villages was covered namely to Bennai (n=17), Pitharkaadu (n=16), Silver cloud estate, Oovelly and Paadanthorai (n=15) (15×3=45), Dhevalai, (n=16), Moolakadu estate (n=10), Yellamalai estate (n=18), Neermattam, Erumaadu (n=10) (2×10=20), Keel Naadukani (n=16), Soondy, Gandhinagar, Cherampady (n=7) (3×7=21), Kolapalli (n=15), Naadukani (n=8). Variables such as name, occupation, years of living etc were collected. This set of questions had asked for direct answers form the respondent (Budolo and Mishra, 1995; Silory and Mishra 1995; Santurrais *et al.*, 1995)

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[How to cite this article:](#)

Jayaraman Dharmaraj and Balasundaram Ramakrishnan. (2017). People’s Perception On Human-Elephant Conflicts In Gudalur Forest Division, Tamilnadu. *Int. J. Adv. Res. Biol. Sci.* 4(11): 55-65.
DOI: <http://dx.doi.org/10.22192/ijarbs.2017.04.11.008>