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HUMAN - ELEPHANT CONFLICT AND MITIGATION OPTIONS IN CENTRAL WESTERN GHATS, WITH SPECIFIC REFERENCE TO ASIAN ELEPHANTS (*Elephas maximus*)

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ABSTRACT
In this study, we have tried to explain the complex interaction between humans and Asian elephants respectively. In a bid to know the aversion of the conflict affected people, a survey was conducted /interviewed people, to know their perceptions and apathy in order to analyse the complex situation of human-elephant conflict. Though there is crop damage being reported by other wildlife also, but the respondents term it to be tolerable or controllable, but they claim the crop damage by elephants as not tolerable or uncontrollable, because of the huge damage caused. These situations turn even worse when loss of life occurs either of humans or of elephants. Hence, there is an immediate need to adopt long term mitigative strategies in order to conserve these mighty creatures.

KEYWORDS: humans, Asian elephants, conflict, wildlife, mitigative strategies.

INTRODUCTION

Human–wildlife conflict (HWC) is inevitable where wildlife and human populations coexist and compete for limited resources (Schwerdtner and Bernd, 2007), and has become a considerable problem throughout the world (Wang and Macdonald, 2005). Particularly, Human-elephant conflict (HEC) is one of the most complex conflict situations which require international attention, because these conflicts have started world over. Conflicts between elephants and humans are now wide spread across Asia and Africa and represent primary threat to the survival of mainly Asian elephants, a globally endangered species (Williams *et al*., 2001). The conflicts are becoming more intense because the rural livelihood totally depends on agriculture for their survival, and crop-depredation by the elephants threatens their livelihood, in order to combat crop-depredation farmers land into conflict with the elephants to an extent that they risk their lives. These conflicts result when elephants damage crops or property or when they accidentally kill or injure people during their movement through increasingly fragmented modern landscapes, approximately around 200-250 people loose lives to human elephant conflict in the Southern India (Rabi *et al., 2014)*. Crop raiding, property damage and human causalities are the most common form of conflicts with wildlife (Inskip and Zimmerman, 2009). Protection of livestock and agricultural crops, threatens the survival of wildlife that comes into conflict with humans (Mishra *et al.,* 2003). Large herbivores and carnivores are particularly affected by the conflicts and are either getting critically endangered or are rapidly decreasing (Woodroffee and Ginsberg, 1998). Human–elephant conflict is a complex problem and a highly sensitive issue that cannot be mitigated through reliance on a single mitigation technique (Sitati and Walpole, 2006). Each site requires a specific deterrent strategy. A range of mitigation strategies have proved to be more effective in deterring raiders, but this reportedly becomes less effective over time (Parker and Osborn, 2006). This is because, crop-raiding elephants soon learn to ignore deterrents and develop resistance to crop protection measures (Bandara and Tisdell, 2002). Hence, the consequences of conflicts between humans and elephants are not only a key concern for conservation but also a major socio-economic and political issue (Sukumar, 1989). In this context the study was carried out to understand the aversion of the respondents towards the conflict and to know the effectiveness of the traditional deterrents used by the respondents and to suggest some mitigative strategies.

MATERIALS & METHODS

Study area

The study was conducted in the fringes of Nagarahole national park in Kodagu district which consists of many small villages out of these villages some 17 villages were selected based on the complicity of the human-animal conflict based on the data provided by the forest department.

Respondents

The respondents were mainly the farmers who were affected by the conflict and some were also labourers who in actual means explained about the problem. Majority of the farmers were marginal farmers whose livelihood is totally dependent on agriculture. The respondents were mainly senior citizens or of 45-70 ages grouped and the respondents were mainly men. The participants were selected randomly, and completion of questionnaires was facilitated through

personal interviews. The respondents were from 17 villages across the study sites. We followed a semi-structured questionnaire to reduce bias in the responses of respondents, while standardised questionnaires were used to ensure the reliability, common applicability and validity of the responses. The questionnaire included socio-demographic variables and a set of open-ended questions related to perceptions of conflicts between humans and elephants.

Questionnaire

We interviewed about 103 respondents in the affected area with the following questionnaire:

A. What are the major reasons for the conflict?
B. How frequent is the problem with the elephants in the plantations and paddy fields?
C. What are the methods followed to deter the elephants from the plantations and paddy fields?
D. How effective are the traditional or age old practices, in deterring the elephants from the crop fields?
E. Are you people satisfied by the compensation system for the crop damage by the forest department?
F. What do you think about the crop loss is it tolerable or not?

RESULTS & DISCUSSION

After analysing the respondents, we have broadly classified there view's into three major views of the respondents:
We considered around 100 respondents

A. What are the major reasons for the conflict?

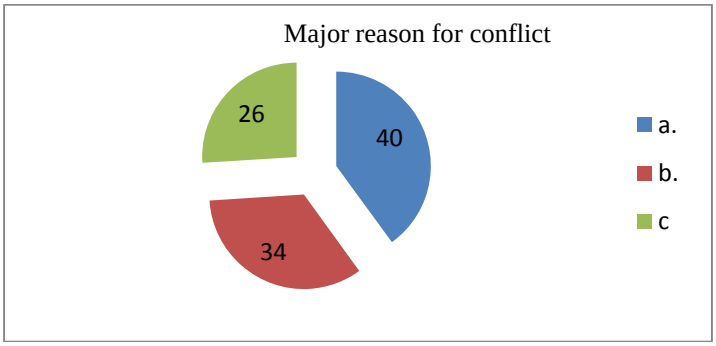

FIGURE 1

For question A the views of the respondents were:

a. 40% of the respondents say that because of increase in the population of the elephants and lack of fodder in the forest conflict is increasing.
b. 34% of respondents say that because of faulty maintenance of the elephant proof trenches (ETP's) and the solar fences the conflict is increasing.
c. 26% of the respondents say that the forest department is totally negligent in managing the stray wild animals of the forest.

These views of the respondents very clearly indicate the common assumption of the people that the population of the elephants is on rise because of conservational strategies and needs immediate attention. It also indicates the lapse of the barriers created to prevent elephants from entering human habitation. Some sects of people feel that the forest department is inefficient or not well equipped in managing the stray wild animals and is negligent.

B. How frequent is the problem with the elephants in the plantations and paddy fields?

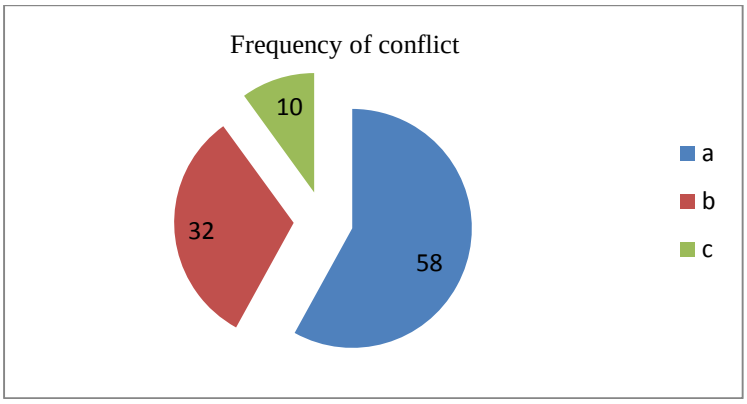

FIGURE 2

For question B the views of the respondents were,

a. 58% respondents say that the elephants mainly frequent the estates when the jackfruit ripening starts and rarely come in search of banana
b. 32% of the respondents say that the elephants majorly frequent, because of the availability of water all through the year in the estates and because of scarcity of water in the forest.
c. 10% respondents say that the elephants have started to frequent the estates during the coffee bean ripening season and the animals have developed the taste for coffee berries, because they find coffee beans in elephant dung.

As the elephant are very fond of jackfruits, majority of the people opine that the elephants mainly come in the season of jackfruit; they also claim that once they develop taste for a particular crop or plant they frequent the place every year. Interestingly, the jackfruit ripening season coincides with the peak of summer when almost all the water bodies in the forest dry up and plantation act as foster home to these mighty creatures. A very small section of people opine that the elephants frequent the estates for ripe coffee berries because they are sweet in taste and entice the animals and they claim it to be true, because they find coffee beans in elephant dung.

C. What are the methods followed to deter the elephants from the plantations and paddy fields?

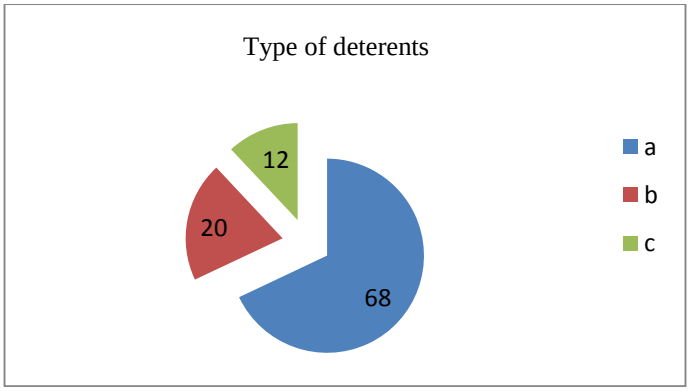

FIGURE 3

For question C the views of the respondents were,

a. 68% respondents said that they use fire crackers and annoying noise to chase or deter the elephants.
b. 20% respondents said that they evict the plants or trees which attract the animals.
c. 12% respondents said that they used barbed fences, solar fences and thorny bushes to deter the animals.

The respondents mainly use some very crude and traditional way of deterring the animals which makes the animals more aggressive and defensive and by evicting the plants or trees which allure the animals it creates stress in animals used to it and are forced to experiment with new plants which in turn make the situation of conflict adverse.

D. How effective are the traditional or age old practices, in deterring the elephants from the crop fields?

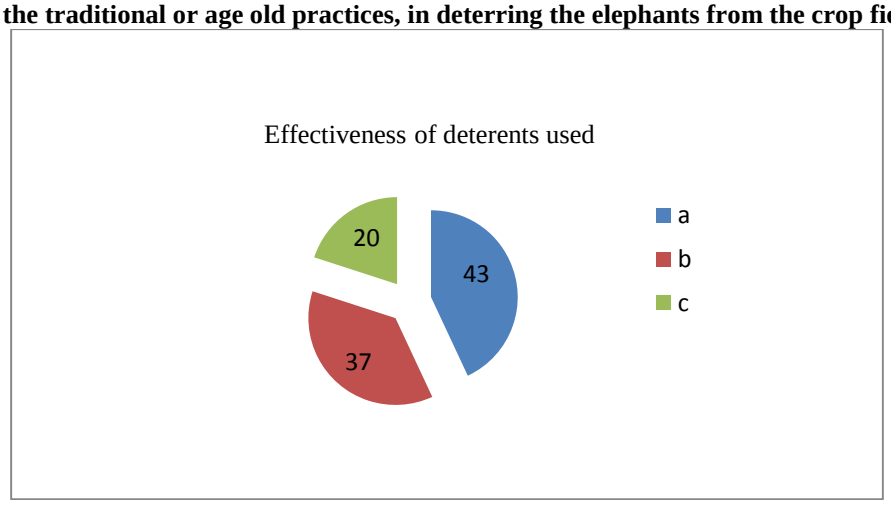

FIGURE. 4

For question D the views of the respondents were,

a. 43% respondents say that the animals have become used to the deterrents and do not respond.
b. 37%respondents say that the animals have become more aggressive, the methods are very risky and the results are bleak.
c. 20% respondents say that the methods are effective but animals very quickly get acclimatised to the deterrents and very soon have no effect.

The analysis of respondents views gives us an insight on how over a period of time, the deterrents have very little or no effect and more over the elephants become aggressive to the deterrents and give bleak results. The usages of one particular type of deterrent for a long time makes the animals acclimatised to the deterrents and have no effect.

E. Are you people satisfied by the compensation system for the crop damage by the forest department?

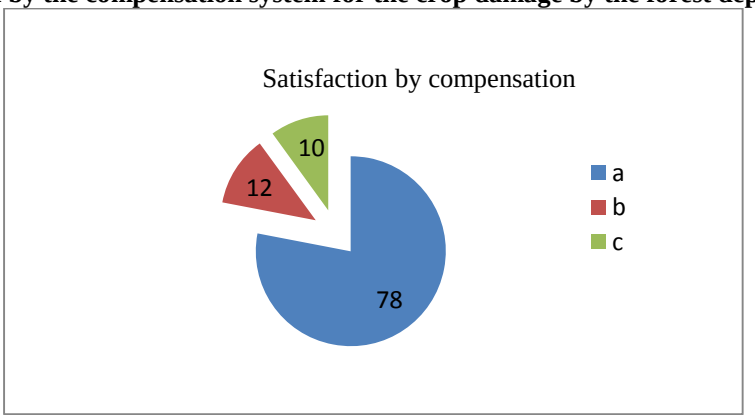

FIGURE.5

For question E the views of the respondents were,

a. 78% respondents say that the compensation provided by the department for the crop damage is very meagre and not satisfying.
b. 12%respondents say that the crop damage assessment is not done scientifically and the compensation does not satisfy the farmers.
c. 10% respondents say that the procedure to claim compensation is very lengthy time consuming and not lucrative.

The respondents majorly opine that the compensation for crop damage provided by forest department is meagre and not on part with the crop and does not satisfy the farming community and more over the assessment of crop damage is not being done in a scientific manner. And the respondents also claim that the procedure to claim compensation is very offending and requires more time and is not satiating.

F. what do you think about the crop loss is it tolerable or not?

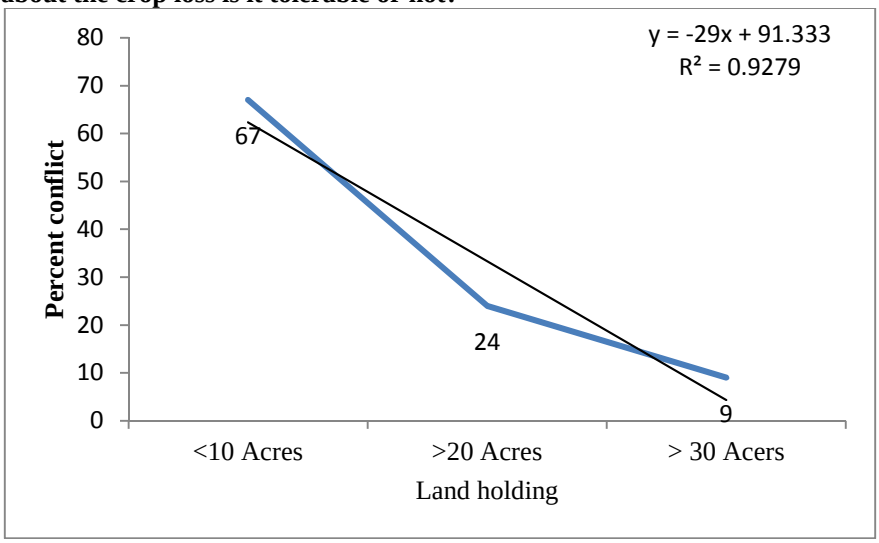

FIGURE.6

For question F the views of the respondents were,

a. 67% of the small land holding (less than 10 acres) respondents says that the loss of the crop is not tolerable because they are solely dependent on agriculture for their livelihood.
b. 24% of the respondents who have marginal land holding (more than 20 acres) and are completely not dependent on agriculture say they tolerate the damage by claiming compensation.
c. 9% of the respondents who have large land holding (more than 30 acres) say that they neglect the damage by thinking that nature has its share and find no major change in profit.

In the study area majority of the respondents were small land holders (less than 10 acres) who entirely depend on agriculture for livelihood and term the crop loss by wild animals as not tolerable and demand quick solution to the problem. While the other sect states that they claim compensation and forcefully satiate themselves because they have other source of income. The large land holders neglect the damage and take precautions to control the damage.
The graph in figure.6 explains the relation of land holding to the percent conflict through regression equation method, the graph explains that lesser the land holding more the conflict and more the land holding less the conflict.

CONCLUSION

The enrichment of the elephant habitat is very much essential and proper and timely management of Elephant proof trenches and solar fences should be encouraged, the work force of the department should be enhanced and during the period of drought the department should ensure water to the animals and try to clear the encroached elephant corridors. And the usage of crude and cruel methods of deterring the animals should be discouraged and conglomerate deterrents should be used in Order to reduce acclimatization to the deterrents. The crop damage assessment system should be changed and the agriculture or horticulture officer should be taken in to assess the crop damage in a scientific manner in order to satiate the farming community and mitigate the complexity of the wicked problem of human elephant conflict.

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