HUMAN-ELEPHANT CONFLICT SCENARIO IN CORRIDORS OF NORTHERN CHHATTISGARH

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Abstract: The present work was carried out in elephant corridors of northern Chhattisgarh (Sarguja, Balrampur, Jasphur, Surajpur and Koriya districts) to understand the scenario of human-elephant conflict (HEC). Four blocks were selected for the study. The field study was conducted in the affected villages/forest areas where migrated elephants were encountered. Incidents relating to conflict such as crop damage, house damage, human death and injury, elephant death, cause of all such conflicts were observed. Local people of the affected villages/forest areas including victims of conflict were interviewed through well structured questionnaires to understand movement pattern of elephant in the area, the way people were affected, their attitudes towards elephant and different aspects of conflicts. A total of 40 households (10 from each block) viz, Lundra, Batuoli, Sitapur and Farsabahar were randomly selected. Damage caused by elephants was of varying extent due to which people have developed antagonistic attitude towards the elephant which adversely affect protection and conservation efforts in the affected areas.

Keywords: HEC, Elephant corridor, Conflicts, Questionnaire, Crop damage

INTRODUCTION

Human-Elephant conflict (HEC) has emerged as a major issue in the field of wildlife management in India (Sukumar, 1994; Easa, 2002; Singh *et al.*, 2002; Kushwaha & Hazarika, 2004). Asian Elephant (*Elephas maximus*), once widely distributed in Indian sub-continent, has now been categorized as "Endangered" species as per IUCN red list. Conversion of forested land into settlements, agriculture, fragmentation, shrinkage and degradation of elephant habitat as well as loss of traditional movement paths resulting in increased HEC (Sukumar, 1994; Singh *et al.*, 2002; Singh, 2002). Elephants, in search of food and water tend to enter human habitations and in the process, often come into direct conflicts by destroying crops, livestock or property and sometimes even by killing people (Sukumar, 1994; Kushwaha & Hazarika, 2004). Corridors are narrow strips of forests connecting two larger forest areas and thereby facilitating movement and dispersal of animals between these patches (Beier & Noss, 1998). Preservation and restoration of corridors are an important aspect of reducing the negative effects of habitat fragmentation (Khanna *et al.*, 2001; Venkataraman, 2002; Nandy *et al.*, 2007).

The wild elephant numbers in India is estimated to be about 28,000 (Bist, 2002). Wild elephants are presently distributed over an area of about 1,09,500 km^2 (Santiapillai & Sukumar, 2006); this is approximately 3% of India's geographical area. Northern Chhattisgarh in central India has been home of Asian elephants since historical times. However, in the early part of the 20^{th} century they became locally extinct (Singh, 2002). In 1988 elephants migrated from the prime elephant habitat of Jharkhand into Chhattisgarh and caused extensive damage to life and property. Since then, HEC has been increasing due to straying of migratory elephants in the state (Singh, 2002). The number of wild elephants in the year 2007-08 in the state estimated to be 122 (MoEF, 2008*)*. Major reason for prolonged stay of elephants in the state could be better (44%) forest cover, heavy mining, habitat degradation and deforestation in the states of Jharkhand and Orissa (Singh, 2002; Earth Matters Foundation, 2008). Even the state of Chhattisgarh is primarily inhabited by tribal communities dependent largely on agriculture and minor forest produce. Increasing human pressure on forested areas is resulting in increased incidences of HEC. This necessitated a detailed assessment of habitat suitability and dispersal corridor for elephants in the area. In this paper, an attempt has been made to present the results on various aspects of HEC along with management implications.

MATERIAL AND METHOD

The study on human-elephant conflict scenario in elephant corridors of northern Chhattisgarh was carried out at four blocks viz., Lundra, Batouli, Sitapur and Farsabahar. The study area lies between 23°37'25'' to 24°6'17'' north latitude and 81°31'40'' to 84° 4'40'' east longitude. The climate of the region is characterized by a hot summer and well distributed rainfall during the monsoon season. The chief feature of climate is long dry period; average monthly temperature rising over 18° C, through maximum summer temperature may even go up to 46°C. The flora of Nazzul and other areas are

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changing frequently with the human activities and land-use. Physiographically, they are remarkable land-forms and average height of area varies from 600 meter and more.

The field study was conducted in the affected villages/forest areas where migrated elephants were encountered. Incidents relating to conflict such as crop damage, house damage, human death and injury, elephant death, cause of all such conflicts were observed. Local people of the affected villages/forest areas including victims of conflict were interviewed through well structured questionnaires to understand movement pattern of elephant in the area, the way people were affected, their attitudes towards elephant and on different aspects of conflicts. A total of 40 households (10 from each block) viz, Lundra, Batuoli, Sitapur and Farsabahar were randomly selected for study and obtained data on various aspects were compiled and analyzed.

RESULT AND DISCUSSION

Elephant arrival time

A distinct pattern of arrival can be seen in the studied corridors where the frequency is increasing during the monsoon season. The availability of food source to the animal is mainly from the agriculture field. The common period of sighting elephant by respondent was during evening (37.50%). It was also found that the number of adults (in a herd) ranged from 2-21 and calf from 0-4 (Table 1).

Elephant damage incident

The crops damaged by elephants mainly constituted paddy (62.50%) and sugarcane (37.50%), respectively. This is also due to the fact that the main crop grown in this region are paddy and sugarcane besides maize, groundnut, millets etc as can be seen with the land use pattern and these are preferred crops by the elephants. Likewise, house damage and human injury are due to the habitation in forest fringe areas and availability of palatable tree species near by their homestead, farm lands etc. and the tribals of this region store the rice, wheat and local made liqueur (mahua wine, rice bear, tadi, sulfi, hadiya etc.) in house which attracts the elephant as a result of which severe incidences takes place.

Local mitigation measures

Most common mitigation measures used by the people to keep away elephants are the torches (77.5%), shouting (72.50%), rattling tins and drums (62.50%), guarding crops at night on guard houses (50%), fences (22.50%) etc. The most effective as said by the respondents are use of torches, shouting, banging tins and drums and use of chili (*Mirch mashals*). However, these methods are only effective if used in combination depending upon the size of herds. More the number of people the more effective they are and the use of an individual method are not known to be effective.

Most the cases HEC incidents were caused by small herd. Degradation of forest areas due to increasing human pressure tend towards HEC. When the interactions between elephants and human beings become very close certainly there would be a conflict between man and elephant. Elephants cause crop damage and attacks people which lead to severe injuries and ultimately to death. Besides this elephants also damage to human properties.

HEC is a major problem in the northern parts of Chhattisgarh especially in and around Sarguja District where wild and migratory elephants are mostly found because of the corridor. Every year large area of agricultural land is destroyed and many people are injured/killed by elephants. Some dominant reasons are evident behind this increase which includes illegal entrances into forests for resources collection, illegal settlements and extreme agricultural practices near forest edges. The increasing human population pressure encourages people to adopt illegal ways of survival. Poor people are being driven from their original places due to lack of alternative livelihoods, lack of land and are persuaded to illegally build their houses near forests. New illegal settlers and previous existing communities are both vulnerable to elephant attacks due to their locations near forests. Human and elephant conflict occur basically in some specific locations including settlements near forests, agricultural fields adjoining to forests. Wild elephants frequently raid villages nearest forests for the purpose of searching food due to food shortage inside the forest. Overexploitation of forest resources by new settlers and inherited local communities are the prime reason for the elephant food crisis inside the forests. During a raid in the forest edge or near forest crop land result in a conflict with high intensity and the ultimate result are more deaths and injuries. In that case, elephants occasionally face deaths or injury. Remarkable number of deaths and injuries are possessed during direct conflicts between humans and elephants.

In northern parts of the state, elephant corridors are being blocked due to the excessive pressure from deforestation, elicit felling, poaching, land use change, fragmentation, infrastructure development, expanding farming activities as well as illegal encroachment by local people. A viewpoint from both sides indicates that the human being is the key indicator for such a conflict rather than the elephant. There is a need for a clear policy and strategic planning to resolve elephant-human conflict and elephant conservation. Forest department is taking several initiatives which include awareness among the local people, *Haathi Sahayata Kendras*, workshops, seminars, trainings, compensations etc. The current approach to dealing with conflict has largely been adhoc, and predisposed to failure because of inappropriate application of methods, lack of involvement of local people, lack of monitoring of conflict and conflict mitigation measures, and inadequate understanding of elephant ecology (IUCN, 2006). Lack of a policy also leads to an inordinate focus on the symptoms rather than the causes of the problem. No single solution is effective and different approaches need to be integrated to address HEC proactively.

CONCLUSION

With the increase in population and land use changes resulting in further conversion of elephant habitat into agricultural land, there would not be an end to the problem. The encroachment of its natural habitat and conversion to recent settlement is already a concern and seems to invite the conflict. It is necessary to organize proper awareness programmes and establish good communication channels with villagers, particularly frequently elephant movement areas and affected villages, nearer to elephant corridors.

Some suggestions are forwarded to mitigate the problem of HEC in the region which includes: facilitate food and shelter to the elephants, proper emphasis should be given to develop a more variable and feasible dense forest cover, open up the elephant corridors for free movement of elephants, alternatives should be given to the livelihood of the affected villages, proper zonation of corridors can be created, incorporation of unpalatable crops like chilly, citrus and tobacco, etc in cropping systems along with live fencing, emphasis should be given to develop permanent drinking water facility across the corridors, local people along with forest officials should be imparted proper training by the experts, so that they can drive away the elephants using proper scientific methods, A participatory approach is essential to be adapted on the basis of the forest's need and existing pattern to check the problem of man-elephant conflict.

Table 1. Identification of Elephant and Elephant Damage Incidents (n=40)

Query	Response	Percentage/Range
Do you know that long ago wild elephants were widely distributed in the forests of Chhattisgarh	Yes	100.00
Source of information	Grandparents	40.00
	Self	75.00
Have seen an elephant	Yes	82.50
	No	20.00
Type	Wild	92.50
Location of sighted wild elephant	Neighboring forest	75.00
	Outside forests	25.00
Activity of sighted wild elephant	Feeding	37.50
	Standing	12.50
	Walking	15.00
	Damaging property	35.00
Number of sighted wild elephants	Loner	10.00
	Pair	15.00
	Herd	75.00
Before observing wild elephant causing property damage your opinion about wild elephant	God	57.50
	Beautiful creature	7.50
	Dangerous animal	35.00
Are you satisfied with the present compensation scheme in relation to	Yes	12.50
	No	87.50
Are you satisfied with present steps undertaken by forest	Yes	12.50

department to reduce conflict	No	87.50
Place	Forest	67.50
	Non forest	32.50
Which elephant sighted	Loner	17.50
	Pair	17.50
	Herd	65.00
If loner then	Tusker	2.50
	Tuskless	7.50
If pair then	Tusker	10.00
	Tuskless	5.00
No. of Elephant sighted		2- 21
Calf sighted		0-4
Elephant arrival time	Morning	5.00
	Day time	20.00
	Eveninig	37.50
	Night	32.50
	No fixed timing	5.00
Local mitigation measures used	Shouting	72.50
	Torches	77.50
	Banging tins and drums	62.50
	Fence	22.50
	Throwing stones	25.00
	Night guarding on guard house	50.00
	Chili	25.00
House damages		70.00
Human injury		20.00
Crop damage	Paddy	62.50
	Sugarcane	37.50
	Groundnut	32.50
	Millet	27.50

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