



Man-Elephant Conflict: Case Study from Angul Forest Division, Odisha, India

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Abstract

We investigated the human-elephant conflict in 6 different ranges in Angul forest division Odisha, India. During 2001-02 to 2012-13, a total 36 human killing and 87 human injury cases caused by elephants are record and 37 elephants had died. Damage to agricultural crops by elephant was of varying extents. As a result people have developed antagonistic attitude towards the elephant which adversely affect conservation efforts.

Keywords:

Introduction

The Asian Elephant *Elephas maximus* (Linn.) were once common all over the tropical south and south-east Asia, from India to Vietnam and Sumatra. Although its general range has remained almost the same, expansion of human habitation, destruction of habitat for agriculture and poaching have resulted in a sharp decline in wild populations and severe habitat fragmentation¹. Asian elephants are presently confined to 13 Asian range countries of which India holds over 50% of the global population-approximately 24,000-28,000 distributed across 18 States^{2,3}. In recent years, increasing human-elephant conflict has been a major issue for a managing wild elephant populations in India⁴⁻⁸. Eastern Part of India particularly in Orissa elephants were abundant in dense *Shorea Robusta* (Sal) forests. Orissa has about 57% of the elephant habitat in central India with 1800-2000 elephant spread over 11000 km⁹. Habitat fragmentation is a problem faced by many species all over the world due to expansion in urban settlements and infrastructure developmental activities. As a result many species under threat, some even facing (local) extinction. One of the species facing these problems is the Asian elephant (*Elephas maximus*). As it requires large areas of natural range it is one of the main species to suffer the consequence of developmental activities¹⁰. The Asian elephant is a high profile and charismatic species with important ecological as well as cultural associations.

Nearly 44% elephant habitat falls within eleven protected areas and three elephant reserves, viz, Mayurbhanj, Mahanadi and Sambalpur have been declared. With two proposed Elephant Reserves Viz, Brahmani-Baitarani and South Orissa Elephant reserve. Conflict between humans and elephants occurs wherever they coexist, especially in the interface between elephant habitat and agricultural land or human settlements¹¹. However, fewer studies have been carried out on human-

elephant conflict at Odisha^{12,13}. Keeping the facts in view, this paper presents an analysis of past conflict records maintained by the Forest Department and Preliminary observations from five year survey.

Study Area: The study area, Angul Forest Division (AFD) (figure 1) is located between latitude 20 17 48 N to 21 31 37N and longitude 84 40 08 E to 85 15 44 E. Total Geographical area 2909.542 sq km and total Forest area 1038.192sqkm which comes 35.68%, 87 RF blocks-511.71 sqkm, 28 PRF-218.54 sq km. Un-demarcated forest 0.542 sq km and 295.953km are in Revenue forest.

Methodology

Field Investigation and site condition monitoring: The field study was conducted between 2009 to 2012 during which the affected villages were visited and migrated elephants were also encountered during this period. Incidents relating to conflict such as crop damage, house damage, human death and injury, elephant death, cause of all such conflicts were observed during field survey.

Interviewing Local People: Local people of the affected villages including victims of conflict, forest staff were interviewed through 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.

Official Collection of Information: Data on human-elephant conflict in previous years from 2001-02 to 2008-09 were collected from the local Divisional Forest Officers to make Comparative study on human-elephant conflict in Angul forest division.

Geographical Area(In sq km)	Total Forest (In Sq km)	RF(In Sq km)	PRF(In sq km)	Un-demarcated forest(In sq km)	Revenue forest(in sq km)
2909.542	1038.192	511.71	218.54	0.542	295.953

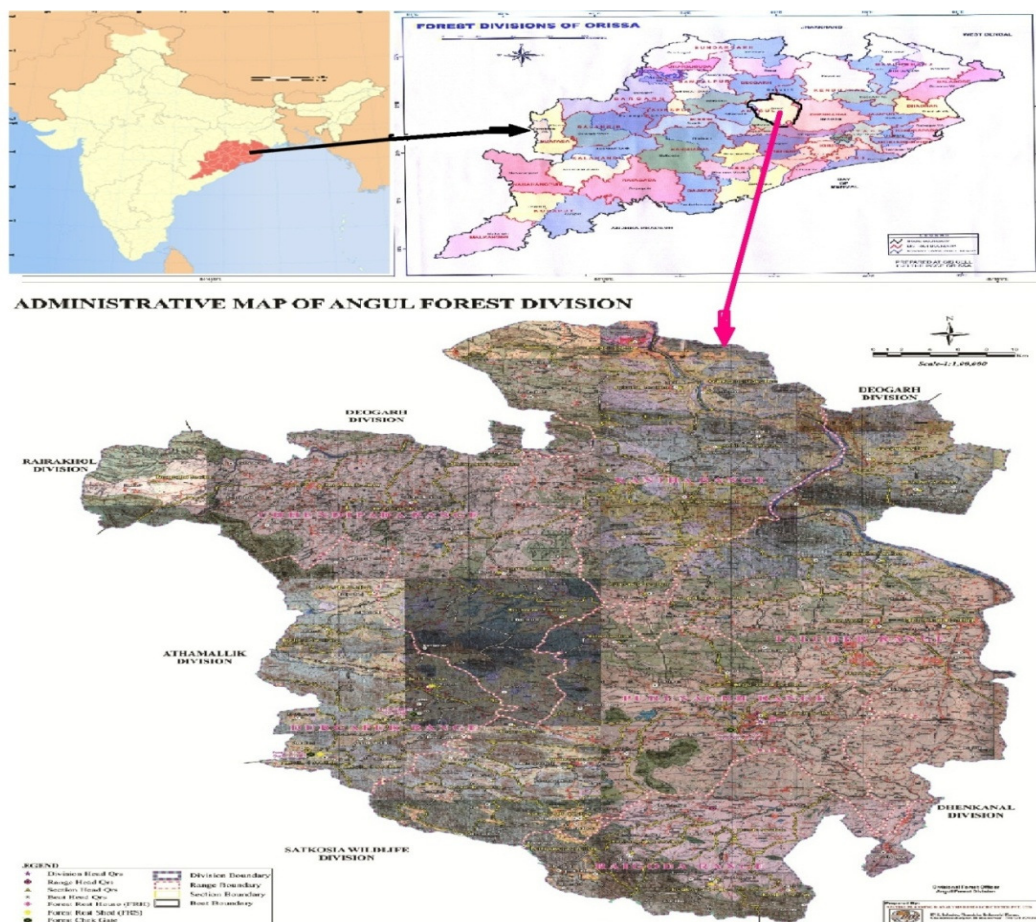


Figure-1
Map showing the location of Angul forest division, Odisha, India

Results and Discussion

Human Death: During 2001-2012 a total of 123 human casualties by elephants were recorded in six ranges of Angul Forest Division which included 87 cases of human injury (71%) and 36 cases of human death (29%). In human death cases, 22 times victims was a man and 14 times a woman where as in human injury cases 58 times the victim was a man and 29 times a woman. An analysis of intensity of conflict over a period of 12 years, showed that the maximum number of human injury in (n=22)2008-09 figure 2. Monthly variation of human injury by elephant is given in figure 3.

The analysis of 12 Years (figure-1) shows that maximum number of human death in 2005-06 and 2008-09. On consideration monthly variation of human death, highest number was observed in June and July (n=6,17% each)

followed by March and August (n=5,14% each) November and December (n=4,11% each), February (n=2,5%), January, May, September and October (n=1,3% each) and April there was nil incident during 2001-2012. Human casualties were comparatively less during April nil, January, May, September and October (n=1,3%) and February (n=2,5%) monthly variation of human death by elephant is given figure 3.

Highest number of incidences of human deaths by elephant attack occurred between 06:00-12:00 hours (n=17) followed by 00:00-06:00 hours (n=9)18:00-24:00 hours (n=7) and 12:00-18:00 hours (n=3). Time variations of human death by elephant is given in figure 4.

House and Crop damage: During the study period 398 nos house damage by elephant and maximum nos of damage in

(n=125) and total 7297.24 acre of crop damaged by elephant in different seasons during the study period in AFD (table 1).

Elephant Death: Between 2001-02 and 2012-13 a total of 37 elephants had died at Angul Forest Division which includes 11 adult males, 13 adult females, 4 juveniles and 9 calves. The

cause of death were electrocution (n=16, 43%) Disease (n=6, 16%), fighting (n=4, 11%) natural and accidental (n=3, 8% each) lighting (n=2, 5%) and poaching, poisoning and unknown (n=1, 3%). During the study period 12 years showed that the maximum 7 number of elephant death in 2011-12, figure-2.

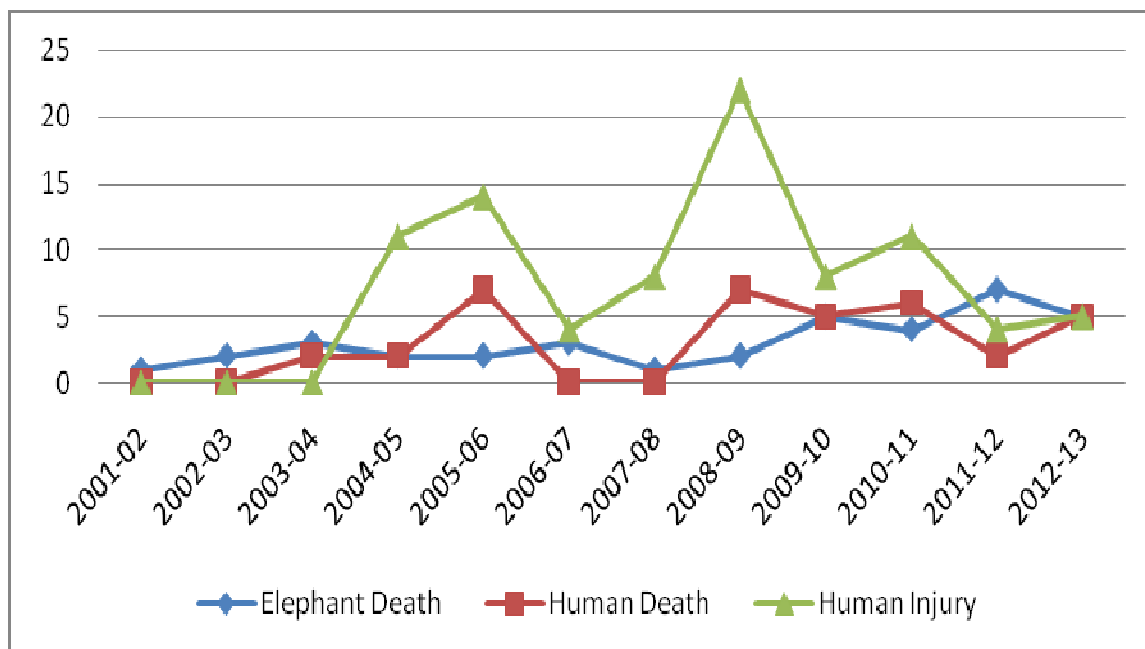


Figure-2
Yearly variation of elephant death, human death and injury by elephant

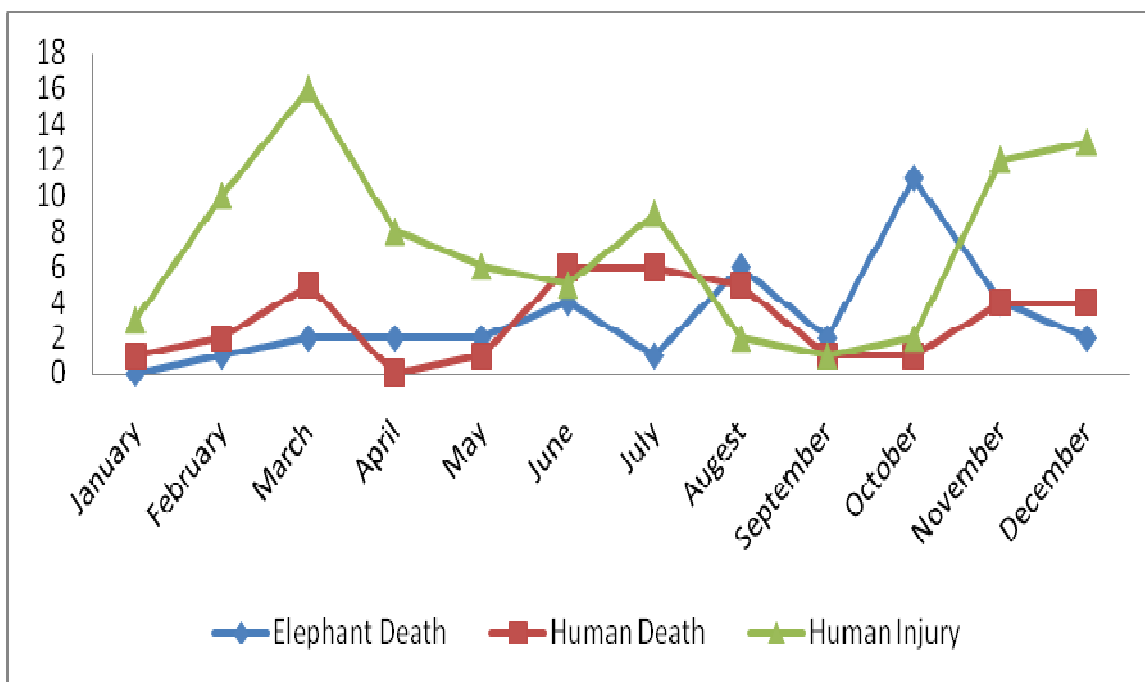


Figure-3
Monthly variation of Elephant death, human death and injury

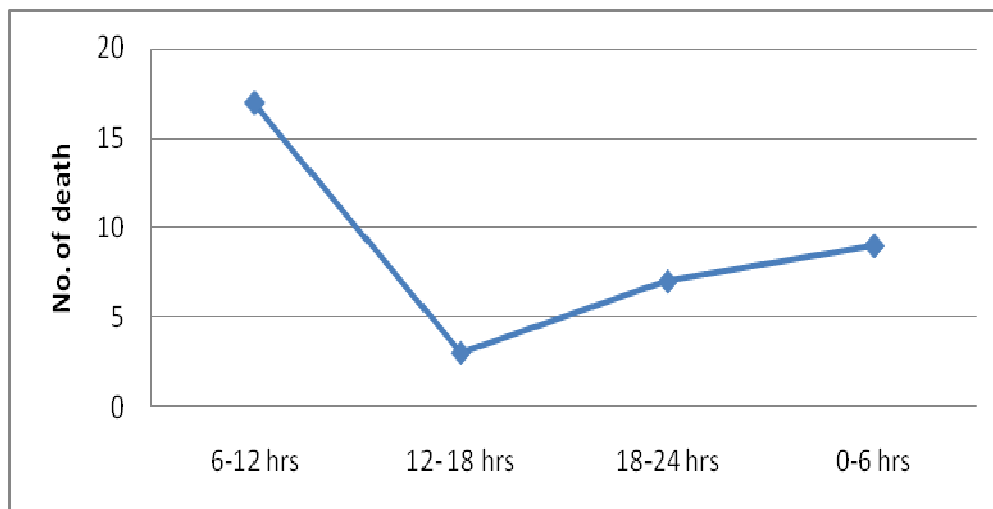


Figure-4
Time variation of human death by elephant

Table-1
Human death and Injury, property damage and elephant death due to HEC at AFD, Odisha

Year	Human Killed by Elephant	Human Injured by Elephant	House Damage by Elephant	Crop Damaged in Acre	Death of Elephant
2001-02	00	00	00	00	1
2002-03	00	00	3	00	2
2003-04	00	11	00	00	3
2004-05	4	14	5	00	2
2005-06	6	4	2	219	2
2006-07	1	8	2	19.24	3
2007-08	00	22	21	437.21	1
2008-09	7	8	62	1269.63	2
2009-10	5	11	60	852.74	5
2010-11	6	4	125	3076.05	4
2011-12	2	5	90	1043.80	7
2012-13	5	00	28	379.57	5
Total	36	87	398	7297.24	37

Observation of Elephants while raiding villages: Raiding groups varied from solitary animals to group. The major raiding activity was of paddy. Most HEC incidents were caused by small group. Large scale degradation of forest areas due to increasing human pressure trend of human-elephant conflicts. 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 attacks on human beings which lead to injuries, severe wounds and ultimately to death. Besides this elephants also damage to human properties. Sometimes the human beings became revengeful towards elephants became lured by the tusk of male tusker and cause elephant deaths. These are the reasons behind human-elephant conflict.

Conclusion

Organize proper awareness programmes and establish good communication channels with villagers, particularly frequently

elephant movement area and affected villages, nearer to elephant corridor. Recruit and Train Villagers to handle village level management activities for preventing elephant intrusion. Strengthening the elephant squad and elephant trackers in concerned division and ranges where human elephant conflict is more.

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