

Status of human-elephant conflict in Chirang-Ripu Elephant Reserve of Assam, India

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Abstract: Site-specific understanding of the peoples' perception on the issue of human-elephant conflict has a great value in drawing the conservation planning which has been often given less priority. In Chirang-Ripu Elephant Reserve, detailed study was conducted around Manas National Park, but no emphasis was given to other part of the reserve. So, an attempt was undertaken between November, 2016 and May 2017 to find out the people perception on the status of human-elephant conflict in five villages under the Batabari Range of Baksa Forest Division of Assam, India. For this, a questionnaire was prepared covering different parameters on human-elephant conflict. Study found that majority (96%) of the people had an experience of human-wildlife conflict in this area. Elephants were identified as the major animal for conflict (100%) followed by non-human primates (66.7%). Majority of the respondent (70.8%) had received damage to house and household property followed by 33% of crop damage, 16.7% of shop and property damage, 12.5% livestock damage and 8.3% of stored grain loss due to human-elephant conflict. Shortage of food was identified as the major reason (34.6%) of conflict followed by anger due to human torture (30.8%), accidental damage due to fear (23.1%) and loss of corridor (11.5%). Though majority of them (70.37%) got ex-gratia for crop damage, the amount paid to them was very less in comparison to the actual economic loss. This practice may have developed negative attitude towards elephant that may impede the conservation of elephant in the near future.

Keywords: Human-elephant conflict, Asian Elephant, *Elephas maximus*, Manas National Park, Batabari Range.

1. INTRODUCTION

Asian elephants, *Elephas maximus* (Linn.) are presently confined to 13 Asian range countries. India holds over 55% of the global elephant population approximately 27,312 in number that are distributed across 18 states of India (MoEF&CC, 2017). Northeastern India holds around 30% of the country's total elephant population of approximately 11,000 found in discrete populations distributed within 14 habitat fragments across the region.^[1-2] Within this north-eastern countryside the state of Assam is known as the key conservation region of Asian elephants, with an elephant population of about 5,620 as assessed in the year 2011 (Department of Environment and Forests).^[1-2, 3-7]

Unfortunately, large-scale forest destruction and encroachment of the forest habitat has restricted them to small patches of forest resulting higher human-elephant conflict in all the elephant range countries of the world.^[8-10] This leads to the death of about 300 people in Asia every year.^[11] India itself records losing over 190 elephants an year annually.^[11] Recently, the death of 18 elephants due to poisoning in Sonitpur Elephant Reserve accentuates the gravity of this problem. Elephant mortality in retaliation to crop depredation and human killing and due to poaching has far reaching implications for the long-term survival of the elephant population.^[12] Hence conservation of elephant has become a difficult task for the forest officials. The community that resides at the periphery of the forest or park area has a major role in the conservation

of forest and wildlife. This is because; the success of any conservation initiative depends upon the support from the local communities living adjacent to the forest area. Without their participation, nothing can be implemented. So people attitude or perception towards forest and wildlife is critically important in designing long-term conservation strategies.

The North Brahmaputra Elephant Range (ER) of India (Project Elephant, 2007) is located in the foothills of the Eastern Himalayas consisting of three elephant reserves, namely Kameng, Sonitpur and Chirang-Ripu Elephant Reserve. The Kameng and Sonitpur Elephant Reserves together connect with Bhutan in the northern side and further connect with the Chirang-Ripu Elephant Reserve that extends up to Duar belt through Himalayas Foothills and Tarai tract. The entire range supports about 3,250 elephants among which the Chirang-Ripu Elephant Reserve of Bodoland Territorial Area Districts (BTAD) in Assam supports 658 elephants (Project Elephant, 2005). However, very recently large-scale destruction of the forest area in this elephant reserve (other than Manas National Park) has led to higher human-elephant conflict.^[13-16] Around 50 people were killed and over 300 injured by wild elephants from 2002 to 2009 in the BTAD of Assam. Over a dozen of people are killed by elephants and another 20 wild elephants were also killed in retaliation in the Baksa district alone that fall under the BTAD. Hence, a site-specific understanding of the peoples' perception on human-elephant conflict has a great value in drawing the conservation strategies which has been often given less consideration in the conservation planning. Several studies were conducted at Chirang-Ripu Elephant Reserve targeting the Manas National Park while other part of the reserve (Baksa Forest Division of Assam) was paid little initiative to assess and mitigate the human-elephant conflict.^[13-15] Hence a study was initiated between November, 2016 and May 2017 to find out the people perception on the status of human-elephant conflict in five villages under the Batabari Range of Baksa Forest Division of Assam, India.

2. STUDY AREA

Baksa district having coordinates 26.6935° N and 91.5984° E was carved out of a part of Nalbari, Barpeta, Kamrup and small portion of Darrang district. The vegetation of the district is characterized mainly by lush green forest and varieties of fauna. The average annual rainfall of the district is 2971.6 mm.

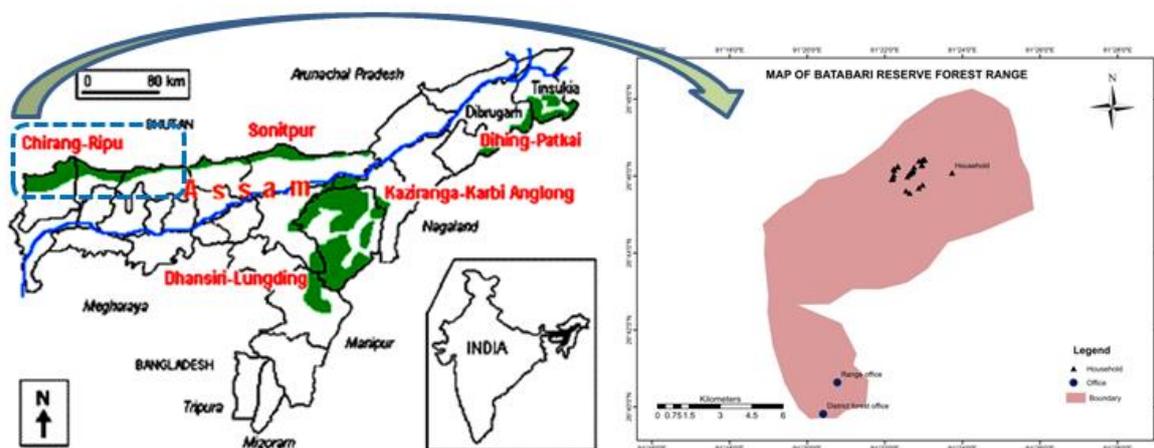


Fig 1: Map of Chirang-Ripu Elephant Reserve showing the study location at Batabari Range under Baksa Forest Division of Assam, India

3. MATERIALS AND METHODS

A questionnaire survey was adopted to find out the people perception on the human-elephant conflict. For this, five number of high conflict villages (Bhutankhuti, Durgapur, Dhansiripur, Bangnabari and Madhupur) were selected for questionnaire survey. A set of questions was prepared covering some aspects of conflict.^[17] For this, household survey was conducted and about 100 household was covered randomly under questionnaire survey and GPS reading was taken to locate the conflict zone. Using the GPS readings the location map was prepared to show the study area where the survey has been conducted.

Table 1: Population status in the study areas

SL No.	Name of village	Area (Ha)	No. of household	Human population		
				Male	Female	Total
1	Bhutankhuti	683.97	475	1267	1251	2518
2	Durgapur	200.72	111	367	271	638
3	Dhansiripur	558.40	333	934	883	1817
4	Bangnabari	126.64	98	235	271	506
5	Madhupur	387.24	156	446	409	855

Source : District Census Handbook, Baksa, Assam, 2011

4. RESULTS

(a) Age group of the respondents

People targeted for interviewing were between 21-90 years age group. Among them, 32% of the total respondents belong to 61-70 years age group followed by 16% each of 31-40, 41-50 and 71-80 years, 8% each of 51-60 and 81-90 years (Fig-2). So, majority of the people selected for interview was from adult group.

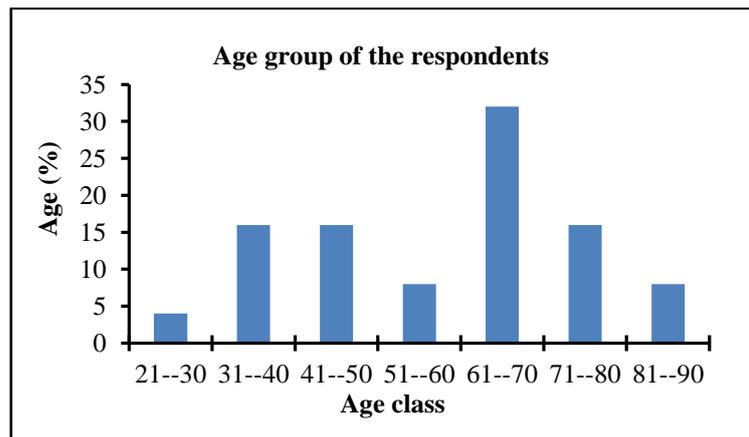


Fig 2: Age group of the people interviewed

(b) Family size

About 51.9% of the responded had a family size between 1-5 members followed by 44.4% of 6-10 and only 3.7% of 11-15 members. This indicates a medium level of resource requirement as the family size was medium (Fig-3).

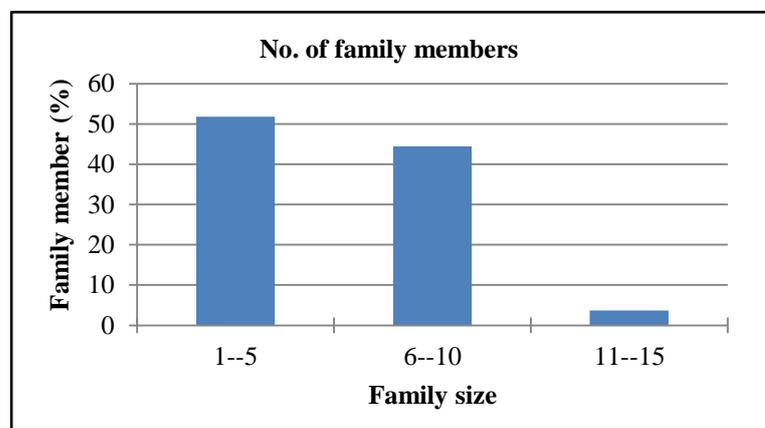


Fig 3: Number of the family member at the study locations

(c) Species involved in conflict

All the respondents (100%) stated that elephant was responsible for higher human-wildlife conflict followed by primates (monkey) with 66.7% (Fig-4). People stated about the intolerable situation arose due to elephant in this area.

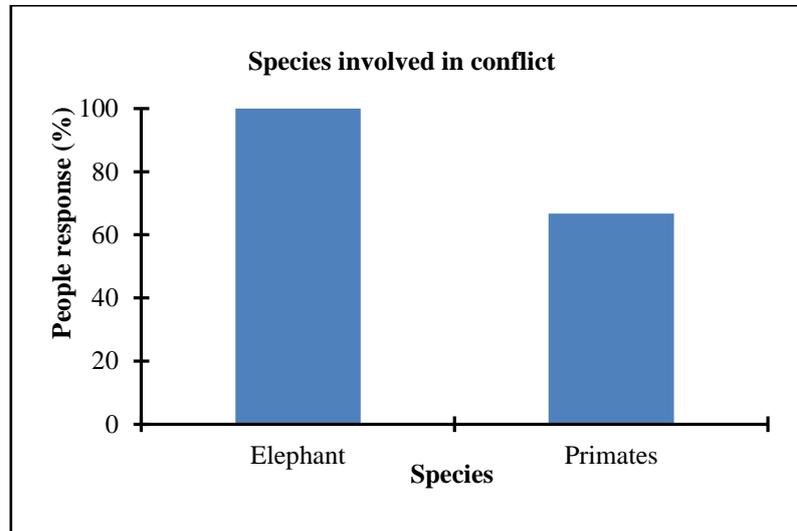


Fig 4: Species involved in conflict in the study area

(d) Period of elephant visit

According to the respondent, elephant visit the area round the year. However, most of the visit (81%) occurred during crop season in comparison to non-crop season (19%) (Fig-5). During non-crop season, elephants often visit the home garden area and cause severe damage to jack fruit, bamboo shoot, banana and beetle nut trees. This clearly indicates that elephant visit in the survey area is associated with food during both crop and non-crop season.

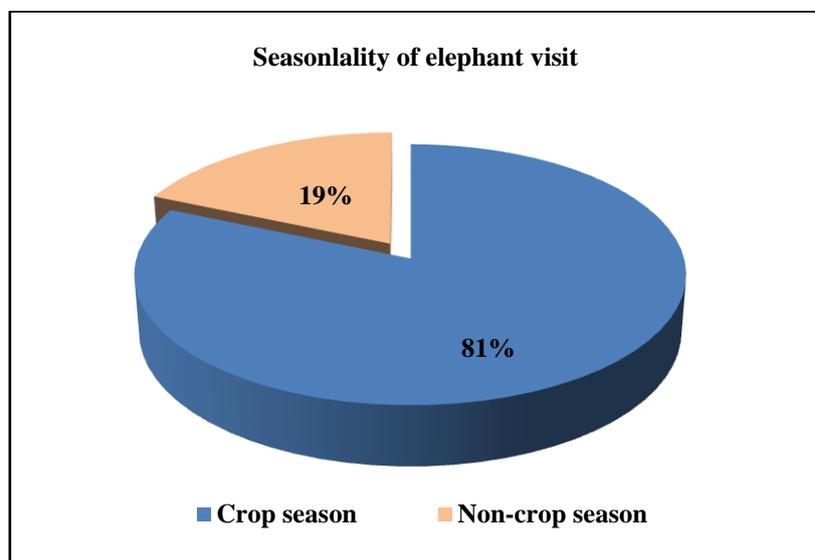


Fig 5: Seasonal variation of elephant visit at the study locations

(e) Cause of human-elephant conflict

About 34.6% of the total respondents stated that shortage of food in the forest area resulted in higher human-elephant conflict followed by 30.8% for anger due to human torture, 23.1% for accidental damage while running away due to chasing by people from the villager and 11.5% due to loss of corridor (Fig-6). These clearly indicate that shortage of food along with habitat destruction and behavioural change results in higher human-elephant conflict in this area.

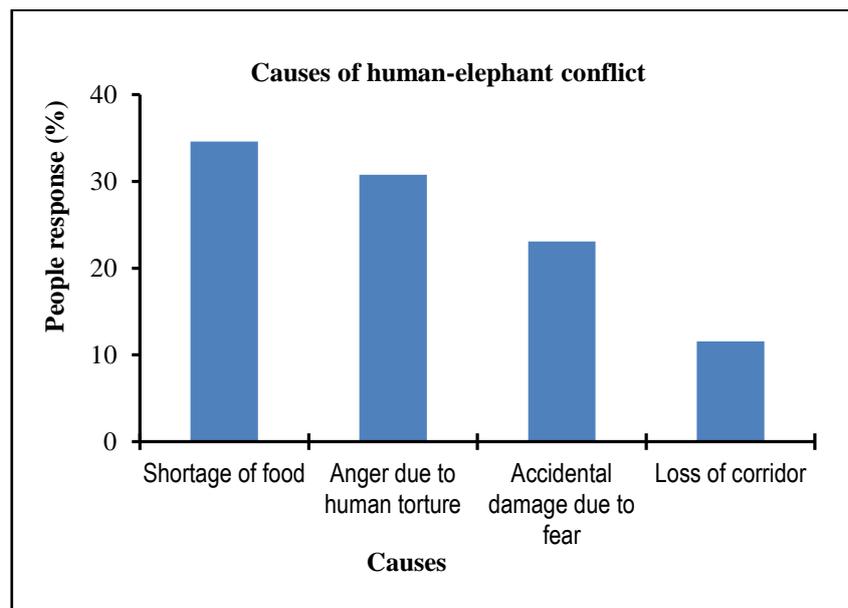


Fig 6: Cause of human-elephant conflict at the study locations

(f) Degree of human-elephant conflict

Majority of the respondents (70.8%) had received crop damage followed by 33% of house damage, 16.7% of shop and property, 12.5% livestock (trampled) and 8.3% of stored grain due to human-elephant conflict. The Chi square test ($\chi^2=22.176$, $df=4$, $p \leq 0.0001$) showed a significant difference regarding degree of damage by the elephants. This indicates that elephants caused severe damage in this area.

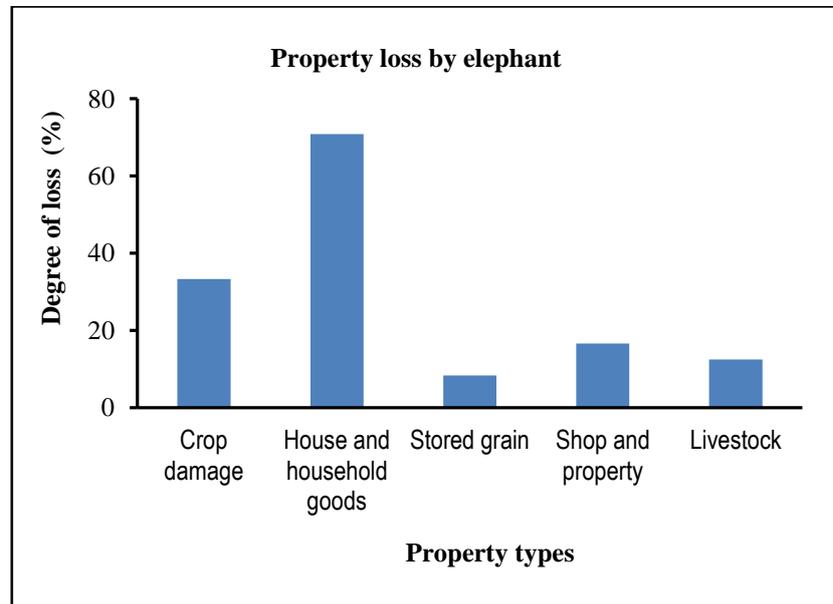


Fig 7: Types of property loss by elephants at the study locations

(g) Mitigation measures

Most of the people (90%) used fire ball while remaining 10% of the people used cracker along with fire ball to chase elephants during their approach in the agricultural land and village area (Fig-8). The statistical analysis ($\chi^2=6.4$, $df=1$, $p \leq 0.011$) showed that there is a significant difference in the view of respondents indicating that the villagers were aware of the conservation issues and suggested different mitigation measures independently.

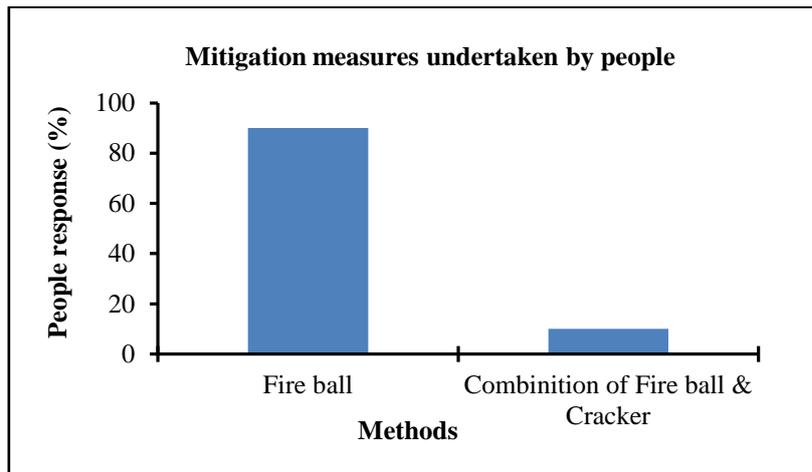


Fig 8: Methods followed to mitigate conflict at the study location

(h) Status of ex-gratia payment

Majority (73.08%) of the people claimed to the forest department for ex-gratia (Fig-9). This indicates that people of this area is aware about the compensation payment.

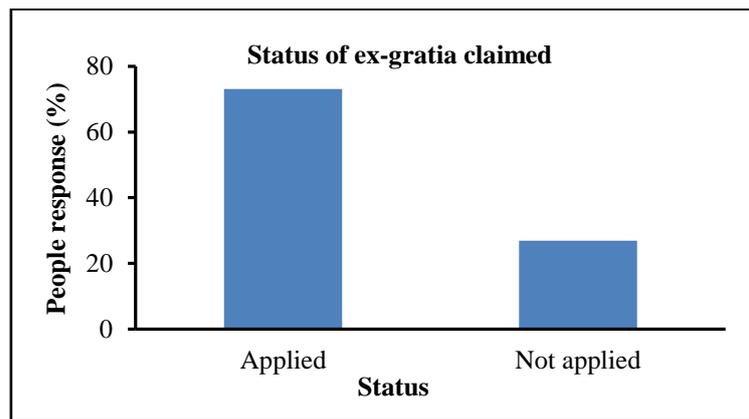


Fig 9: Status of ex-gratia claim by the victim people

Among the people claimed, about 52.6% received the ex-gratia from the forest department. However, the amount of the ex-gratia was very less in comparison to the loss occurred. On the other hand, 47.37% of the people who applied did not receive any ex-gratia from the forest department-(Fig-10). This indicates some discontent among the people residing in this area.

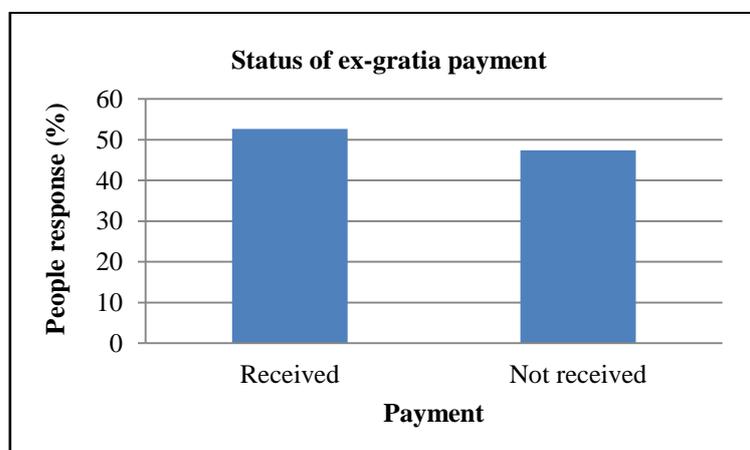


Fig 10: Status of the ex-gratia payment by the forest department

5. DISCUSSION

The population size of Asian elephants is in declining state across its range countries due to poaching and illegal trade.^[18-20] Apart from this, conflict between human and elephant in their range countries have been also resulted in elephant mortality due to killing in retaliation.^[12] Hence, the human-elephant conflict also seems to be one of the major threats to conservation worldwide in recent years.

Any effort for the conservation of elephant has no value until it is supplemented by site specific mitigation measure to reduce human-elephant conflict. However such conservation project must considered the people perception; otherwise conservation of elephant will be meaningless. Hence, in the present day, the success of wildlife conservation initiative mostly depends upon the people participation.^[21] This is because, the communities who reside very close to the forest area are the worst affected by human-wildlife conflict especially from elephant. So their attitude towards elephant plays a crucial role in the management of habitat and the species together as a whole.

Though the number of human death or injury cases due to conflict in the study area was very less compare to other parts of India, still people's ill experience developed some negativity towards elephant.^[12, 22] They often have a close contact with elephant when they visit into the forest for NTFP collection and other purpose.

The other reason of people negative attitude towards elephant may be their economic status. Most of them are small scale farmer and their livelihood completely depends upon the agricultural production. The overall crop depredation around the Manas National Park was less in comparison with other parts of India, but as they have less cultivated area in compared to the number of dependents in each family, any short of damage cause severe economic loss to them.^[14-15, 23-24] Hence, the local attitudes to crop raiding may make it out as a more serious case and there is also a possibility of an increase of such conflict in the near future as habitat loss is continuing and reached an alarming proportion like other area in Assam.^[22] Beside this, the crop is meant for substantial use and no surplus production of crop was noticed. Apart from this, they do not have any alternate to such damage. So any damage to crop and property has an adverse effect on the economy and social status of the people of this region.

6. CONCLUSION

Though the people of this area has such experience of human-elephant conflict since long back, the degree of human-elephant conflict has increased and reached its highest peak in recent years. Therefore, the attitude of the villagers towards elephant has greatly changed. Hence an increase of human-elephant conflict in this area led into a change in peoples' attitude towards elephant as the enemy. This change in attitude reflects the nature and degree of human-elephant conflict of this area. There was an enormous irregularity in payment of ex-gratia by the forest department as informed by them. Very few people were reported to receive the ex-gratia for crop damage up to the level of their expectation. So, they have lost interest in filing such complain. This might have a negative impact in the near future that may affect the conservation effort for elephant.

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