Increasing Trend of Human Elephant Conflict in Golaghat District, Assam, India: Issues and Concerns

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Introduction

In the recent past the Human elephant conflict (HEC) has emerged as the main threat for the survival of Asian elephants across their range. HEC includes crop damage by elephants, property damage and injury or death to people (Ngure 1995; Lahm 1996; Ekobo 1997). Human–elephant conflict represents a widespread, complex, and intractable challenge to conservation. Although of worldwide occurrence, conflicts between humans and wildlife are most intense in the tropics, where wildlife competes directly with rapidly increasing human demand over scarce land and resources. Unprecedented human population growth in Asia has caused increasing conversion of natural habitat to human dominated landscapes, bringing elephants and humans into greater contact and conflict. Confronted with the escalating human–elephant conflict, the historical respect and reverence for elephants in Asian cultures and societies, is rapidly eroding (Fernando *et al*. 2005). Growing human populations, demands for cultivable lands and conversion of forest habitat to human habitation and cropland has resulted serious human-elephant conflicts in Assam, North-east India (Talukdar & Barman 2003).

The forest cover in northeast India is disappearing at an alarming rate. More than 1000 km^2 of forests are destroyed annually (Choudhury 1999). This has resulted in increasing incidents of HEC to alarming proportions in Assam in recent times (Talukdar 1996; Talukdar & Barman 2003; Monier 2006). Elephants are in intense conflict with humans in the Golaghat district of Assam in northeast India. The forests of Golaghat and adjacent district of Karbi-Anglong represents a key landscape for elephant habitats that is represented by seven Reserve Forests, viz. Diphu, Rengma, Doyang, Nambor North, Nambor South, Upper Doigurung and Lower Doigurung covering 308.9 km^2. The region is extremely fragmented owing to large-scale destruction of forests during the last decade and the resident elephant population has been significantly affected. Increasing areas of tea gardens and subsequent loss of forest cover has contributed to the intense HEC in the area.

Since 2006 Aaranyak has undertaken several activities for mitigation of HEC and promoting co-existence of humans and elephants in the Golaghat district. In the context of HEC mitigation, Aaranyak launched a multi-dimensional project targeting the local people in project activities as stakeholders. As part of this larger initiative, we carried out detailed surveys on the localities of conflict and conflict patterns, and formed local self-help groups (SHG) and village level units to manage crop-raiding elephants. Apart from this, Aaranyak provided the villagers and Forest staff with supportive materials like crackers, used mobile phones and a vehicle for rapid response to conflict. These steps have reduced the extent of conflict in certain pockets. However, for long-term co-existence, there is a need for changes in crop patterns and awareness among the people.

Here we report on the study of HEC patterns and intensity in the region during 2009-2011.

Methods

Golaghat district (Fig. 1) is situated in between 25°50'48''N to 26°58'35''N latitudes and 93°19'11''E to 94°14'24''E longitudes in central Assam. Nambor Reserve Forest, which is partly situated in Golaghat and Karbi-Anglong, is the oldest elephant habitat that was declared as a Reserve Forest in 1872. There are hot water

springs inside the forests viz. Garampani, Barpung, Fatasil and several streams, which serve as a drinking water and bathing sources for wild elephants. This region represents a key landscape for elephants, connecting Kaziranga National Park to the forests of Karbi Anglong and Nagaland hills, which facilitates the movement of elephant herds. The forest types in the area consist of Eastern wet evergreen and semi-evergreen forest. In the recent past, the establishment of Numaligarh refinery in Telgaram area, the widening of National Highways and growing tea estates has led to fragmentation of elephant habitats and destruction of their natural corridors (Talukdar *et al*. 2006).

Data were collected on conflict incidents including crop-raiding, house damage and human deaths and injuries during 2009-2011. To establish a reliable and independent conflict reporting system (Hoare & Mackie 1993; Hoare 1999a), a team of three community members were selected and trained to enumerate conflict incidents. This circumvents the problem of over exaggeration of reported conflict by farmers themselves (Siex & Struhsaker 1999). Each enumerator was stationed at a different location within the three administrative beats (Kowani, Numaligarh, Murphulani) of the Golaghat district to offer widespread coverage of an approximate total area of 200 km^2. Each enumerator surveyed an approximate area of 70 km^2. Any crop-raiding incident within an enumerator's area was visited for verification and to record the location using a Garmin GPS12 unit. Further details of the incident, such as elephant group size and composition (male groups vs. female-led family groups) and time of incident, were recorded from complainants on a standardized reporting form (Hoare 1999b). Incidents of human death and injury were similarly recorded.

Results

During the study period, a total of 390 incidents were recorded in the study area. The highest number of incidents was recorded in 2010 (n=180) followed by 2009 (n=119). The administrative area of Numaligarh beat witnessed the maximum number of conflict incidents (n=204), while Murphulani beat area witnessed 179 incidents (Fig. 2). Maximum number of crop damage was

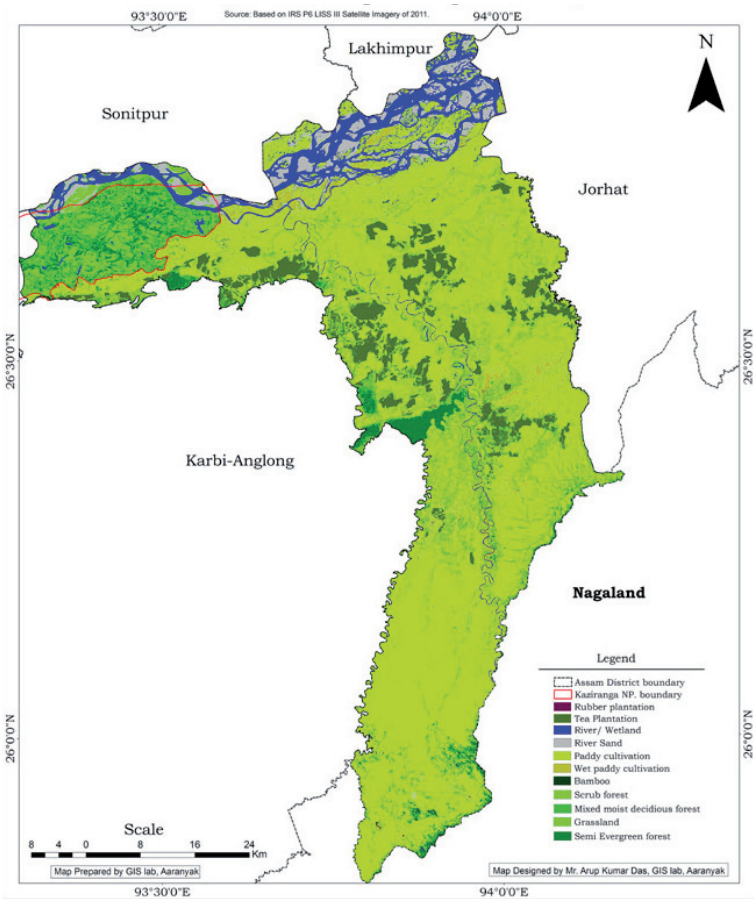

Figure 1. Landcover map of Goaghat District, Assam..

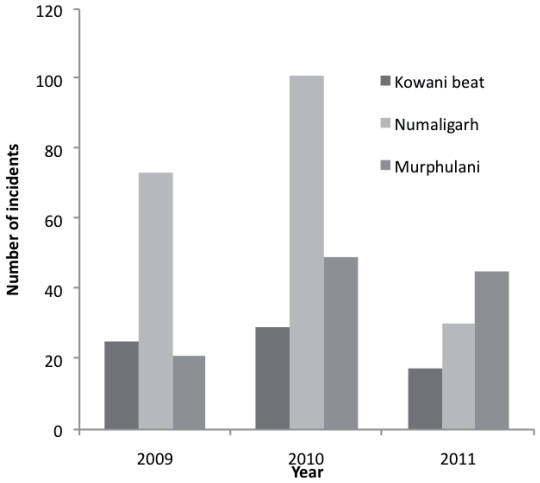

Figure 2. Number of incidents in different areas.

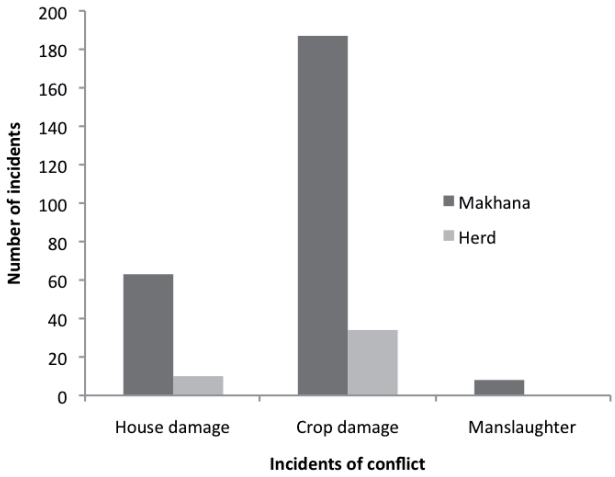

Figure 4. Elephants involved in incidents.

recorded in the year 2009 (n=100) followed by 2010 (n=61) (Fig. 3). The number of incidents varied significantly in the three different beats during the study period (χ^2 =7.1, df=2).

In most incidents, single bull (*Makhana*) elephants were involved (72%) followed by female led family herds (28%) (Fig. 4). The winter months (Oct, Nov, Dec) had maximum number of conflict incidents, which coincided with the crop season in the study area (Fig. 5). During the study period, 12 people lost their lives and 14 elephants died as a result of HEC.

Discussion

We found that in 2011, the number of conflict incidents were lower than in the previous two years. This may be because of Aarnayak's timely intervention in community mobilising and supporting the department with elephant anti-depredation equipment. The Numaligarh area had the highest number of incidents over the three years. This area consisted entirely of elephant habitat in the past. The Numaligarh Refinery was established here by clearing an approximate area of 1000 acres of elephant habitat during 2001, which likely was a major reason for the increased HEC in this area.

Single *makhna* elephants were recorded more in damaging crops than female led family groups. This probably signifies the habitual crop raiding by a few *makhnas*.

Although, the district suffers from human elephant conflict throughout the year, the crop raiding incidents mostly took place in the winter months, which coincides with the cropping season. The people mostly cultivate different varieties of paddy, banana and vegetables during the winter months.

An improved management system, wildlife enforcement, and awareness programs would facilitate unhindered movement of elephants across the landscape and promote human-elephant coexistence in the Golaghat region.

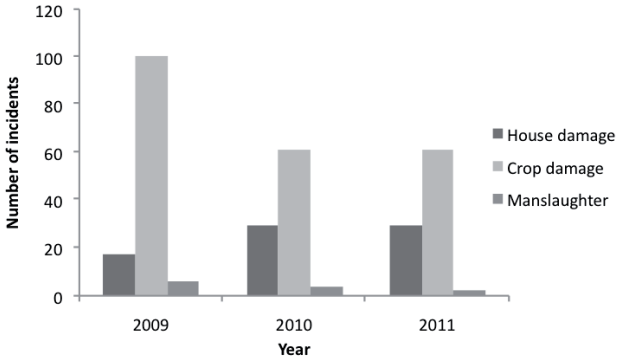

Figure 3. Different forms of HEC.

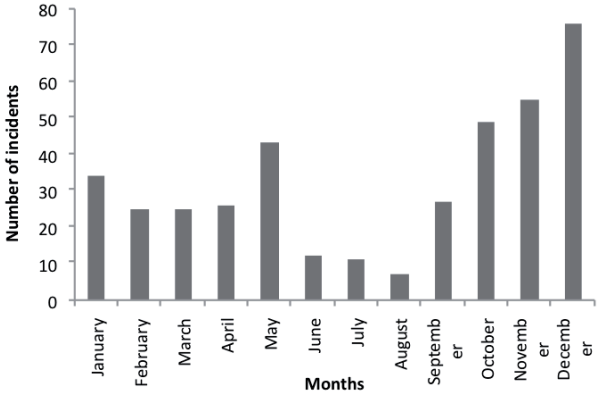

Figure 5. Number of incidents each month.

Forest fragments and riparian vegetation play important roles in the ecology of elephants (Kumar *et al*. 2010). Hazarika *et al*. (2008) reported the positive attitude of the locals for elephant conservation in this landscape. Hence, there is ample scope of restricting further degradation of forest cover in Golaghat district, which in turn may reduce HEC.

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