

Human–Elephant Conflicts in Northeast India

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*Human population increases and development in Northeast India have reduced and fragmented wildlife habitat, which has resulted in human–wildlife conflicts. Although species such as tigers (*Panthera tigris*) and rhinoceros (*Rhinoceros unicornis*) cause conflict, elephants (*Elephas maximus*) have become the focal point for conflict and conservation issues. This article presents several case studies to illustrate the diverse nature of human–elephant conflicts. Between 1980 and 2003, more than 1,150 humans and 370 elephants have died as a result of these conflicts. Although the public and government have taken steps, human population growth must be addressed before any permanent solutions to this conflict can be reached.*

Keywords *human–wildlife conflict, elephant, fragmentation, conservation, India*

Introduction

Northeastern (NE) India is comprised of several states, including Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, and the northern parts of West Bengal. This region covers approximately 274,680 km² (Figure 1) and represents a global biodiversity “hotspot” (Myers, Mittermeier, Mittermeier, da Fonseca, & Kent, 2000). The region is dominated by the Eastern Himalaya Mountains, the Meghalaya Plateau, hill ranges, the plains of the Brahmaputra and the Barak rivers, and the Manipur valley. NE India contains diverse habitat including grassland, wetland, swamps, tropical evergreen and deciduous forest, subtropical and temperate forests, and alpine tundra. The region has the highest diversity of mammals (250 species) and birds (900 species) in India, many of which are threatened (Choudhury, 2003).

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Map by Dr Anwaruddin Choudhury

FIGURE 1 Map of Northeastern India.

Human population increases and development have reduced and fragmented wildlife habitat. Settlement, cultivation, and developmental activities have dramatically encroached on natural habitat, resulting in severe conflicts between humans and wildlife (especially elephants, *Elephas maximus*). Between 1980 and 2003, more than 1,150 humans and 370 elephants have died as a result of human–elephant conflicts in NE India. Unlike parts of Africa (Barnes, 1996; Bhima, 1998; Kiiru, 1995; Hill, Osborn, & Plumpre, 2002; Thouless, 1994), however, there is little documentation of case studies in this part of India. Brief overviews on Sumatra and Karnataka, southern India are found in Santiapillai and Widodo (1993) and Sukumar (1986).

This article presents several case studies from NE India to illustrate the diverse nature of human–elephant conflicts. In addition, it discusses the strengths and weaknesses of possible strategies for mitigating these conflicts.

Methods

Data for this article were obtained from field studies (since 1985) aimed at a broader survey of wildlife in general in different areas of NE India. These studies examined the presence, distribution, and status of different species of wildlife, especially elephants. The fieldwork also recorded conflicts between humans and elephants. Effort was made to interview the villagers, forest staff, and hunters/poachers that had experienced conflicts with elephants.

Results

The tiger (*Panthera tigris*), leopard (*P. pardus*), snow leopard (*Uncia uncia*), jackal (*Canis aureus*), dhole/wild dog (*Cuon alpinus*), wildcats (*Felis* spp.), civets (*Viverra zibetha*, *Viverricula indica*), and mongoose (*Herpestes* spp.) were often in conflict with humans throughout NE India, as these species kill livestock and poultry. Much of the habitat and prey of these species has been lost as a result of human population growth and development. Humans hunt several of these species for their pelts and bones. Rhinoceros (*Rhinoceros unicornis*), wild buffalo (*Bubalus arnee/bubalis*), hog deer (*Axis porcinus*), wild pig (*Sus scrofa*), rhesus macaque (*Macaca mulatta*), and birds such as the purple moorhen (*Porphyrio porphyrio*) also cause damage to cultivations and gardens. Many species of wildlife are affected by the impact of human development on their traditional habitat and food sources.

Conflicts between humans and elephants in NE India, however, are more serious and have become a major conservation issue. NE India is home to more than 10,000 wild elephants, around 25% of the world's elephant population (Choudhury, 1999a). With the decrease in forest cover due to human population growth and development, the conflict increases daily; more than half of the elephants' habitat has been lost since 1950. Crop raiding by elephants is a common occurrence throughout the region. During the paddy season, for example, many elephants travel to the plains of Assam and remain at the edge of the forest for a few weeks. Among the *jhumiyas* (i.e., shifting cultivators) and the individuals living in the hilly areas, human–elephant conflicts occur when the elephants raid their crops, which are scattered over a large area of fields interspersed with forests. Depredation in human settlements is another major area of human–elephant conflict. Most of these conflicts, however, occur in small forest pockets, encroachments in elephant habitat, and on elephant migration routes.

Case Studies

Sonitpur, Assam (Organized Habitat Destruction)

The Kameng area in Arunachal Pradesh and Sonitpur in Assam (contiguous habitat) support a large elephant population that varies between 900 and 1200 animals. Inside Sonitpur in Assam, approximately 500 to 800 elephants occur at

different times of the year. During the paddy season, the elephants travel down from the Himalayan foothills in Arunachal Pradesh. In the early 1990s, these elephants sometimes damaged property and raided crops. A few human deaths occurred as a result of these human–elephant conflicts, but elephants were usually unharmed. Politically motivated developments by the mid 1990s, however, heightened the level of encroachment. By 2002, at least 50% of the prime elephant habitat in the region was lost (Choudhury, 2002b) and human–elephant conflicts became commonplace. Human deaths from elephants increased in 1993 (32), 2001 (26), and 2002 (28) and in retaliation, over 30 elephants were poisoned from 2001 to 2002 in Sonitpur and adjacent areas. Human awareness, motivations, and compensation for human injury and death intensified and an “Elephant Reserve” was developed. One of the only possible solutions to mitigate this conflict is to restore elephant habitat to pre-1990 conditions (Bist, 2002; Choudhury, 2002a).

Cachar, Assam (Extirpated)

In the 1950s, around 100 elephants lived in the foothills of Barail range in Cachar, Assam and in the Jaintia Hills in Meghalaya. By the early 1980s, however, this herd of elephants was reduced to 25–30, as they were separated from Jaintia Hills due to habitat fragmentation and other human-related disturbances. In 1993, only 18 elephants were counted and by 1997, only 4 remained. Since 1998, no elephants have been seen in this region. Elephants became extirpated from the area.

From 1991 to 1997, these elephants killed 41 humans (18 people in 1992). The elephants had wandered aimlessly for about a decade due to the encroachment and destruction of habitat within their range, fears of poachers, and government sponsored shootings of “rogue” elephants (Choudhury, 1999a, 2001a).

Nambor-Garampani, Assam (Behavioral Change)

Nambor-Garampani forest in Assam is well known for its elephants. Like most areas in NE India, the habitat has suffered from human encroachment and deforestation. A busy national highway passes through the forest. In the early 1990s, some elephants became a serious and regular hazard, displaying noticeable behavioral changes as they searched vehicles for food (e.g., fruits, sugarcane). This area became a popular tourist attraction in 1991–92 (Choudhury, 1992, 1993). Some of the elephants were poached, but little poaching is currently reported. The bulk of the remaining habitat in this forest has been protected as wildlife sanctuaries and the diversion of the highway will help to improve the situation and mitigate human–elephant conflicts in this area.

Other Case Studies

Garo Hills, Meghalaya is a major habitat of elephants (over 1,800 in 1993 and 1,200 in 2002). In this area, increased *jhum* (i.e., shifting cultivation), coal mining, logging, and poaching (for meat and ivory) significantly disturbed elephants (Gurung & Lahiri-Choudhury, 2000; Williams & Johnsingh, 1996). Over 200 elephants descended on the Assam's Goalpara district where none were recorded during the census of 1993 (small numbers used to be seen seasonally). Approximately 100 elephants currently live in the scattered forest blocks and damage surrounding houses and property. From 1990 to 1992, there were no human deaths as a result of conflicts with elephants, but a few people have been killed every year since 1993. There is no apparent solution in sight.

In Mizoram, Nagaland, and in the hilly areas of Manipur, human–elephant conflict has had a different history. The elephants have almost always been persecuted for their flesh, which is a local delicacy. Currently, 10–12 elephants are found in Mizoram (Choudhury, 2001b) and in the hills of Manipur, most are occasional/seasonal visitors. Elephants have vanished from most parts of Nagaland, but some (upwards of 200) are found in a few pockets where the area is contiguous with Assam.

Conservation Issues

Habitat Loss and Fragmentation

One of the major instigators of human–wildlife conflict is competition for space. Destruction of forests through logging, encroachment, slash-and-burn shifting cultivation, and monoculture tree plantations are major threats to the survival of the elephant. The forest cover in NE India is disappearing at an alarming rate. For example, more than 1000 km² of forest were destroyed annually in the 1970s and 1980s (NRSA, 1983). Forest cover had declined from 51% in 1980–1982 to 24% in 1995 in Manipur (a closed forest has canopy cover of >40%). During the same period, the forest cover in Meghalaya declined from 33% to 18%, and from 43% to 17% in Tripura (FSI, 1997; NRSA, 1983).

Encroachment into forested areas is a major problem. In the 1970s and 1980s, for example, almost the entire population of elephants and other wildlife had disappeared from the 900 km² rain forest tract comprising Nambor south, Diphu, and Rengma in Golaghat district (Assam) because of border problems with Nagaland and subsequent logging, poaching, and encroachment (Choudhury, 1999c).

In the hilly areas throughout NE India, shifting cultivation is an important contributor to forest destruction. For example, in a small state such as Manipur (22,327 km²), this practice currently covers more than 1,800 km² or 8.2% of the

total area. Even in the hilly areas of Assam, the area currently under shifting cultivation is more than 2,600 km². The destruction of the forests is reducing and fragmenting habitat.

Poaching

Many species (including elephants, rhinoceros, and tigers) are killed for international trade of their body parts. Although poaching is not a direct source of conflict, injured elephants and other animals (e.g., tigers) often retaliate by killing humans and damaging their property.

Developmental Activities

Developmental projects invite conflict between humans and wildlife. Human development destroys and fragments wildlife habitat, blocks migration routes, facilitates encroachment, and encourages poaching. For example, bamboo harvesting for paper mills (Jagiroad, Panchgram, and Jogighopa in Assam; Tuli in Nagaland), oil mining/exploration (Assam and Arunachal Pradesh), and open-cast coal mining (Assam and Meghalaya) have disturbed and destroyed wildlife habitat, as well as caused pollution. The workers, many of whom are poachers, have encroached on adjacent forestlands. New settlements have been developed due to other subsidiary activities.

Construction of roads, railways, and other infrastructure projects destroy and fragment natural habitat, and allow encroachment, logging, and poaching to occur. Planned hydroelectric projects along the Siang, Lohit, Dibang, Subansiri, and Barak rivers will flood considerable forest habitat (Goswami & Das, 2003; Vaghlikar & Ahmed, 2003). The elephants will have less space to live and may lose many migratory routes; conflicts have the potential to increase.

Discussion

For human–wildlife conflicts in NE India, especially with elephants, the blame should be placed entirely on humans. Elephants were domesticated for a long period of time and many people worshipped them as “Lord Ganesha.” However, people were not concerned when the elephant became extirpated in southern Assam’s Cachar district.

The worst case of human–elephant conflict ever recorded was in the northern area of Darrang (now in Udalguri district, Assam) in October 1992 when 4,000 villagers belonging to 900 families fled their villages and took shelter in relief camps set up by the government (Choudhury, 1999a). A recent study in Assam found that an area between Karbi Anglong and Kaziranga National Park lost a third of its annual production of paddy to elephants (Choudhury, 1998). This area is located near an elephant migration route.

Humans have died from conflicts with elephants in NE India. In just one week in August 1993, elephants near Burhachapori and Laokhowa wildlife sanctuaries in Assam killed more than 50 people. A lone “rogue” bull caused more than half of these deaths. From 1980 to 2003, as many as 1,010 people in Assam and more than 1,150 people across NE India have died from human–elephant conflicts (Figure 2). In 1997 alone, 68 people died from conflicts with elephants in Assam. Elephants have also died as a result of human–elephant conflicts. More than 370 elephants were killed or poached in NE India between 1980 and 2003, many of which were killed in retaliation by villagers.

Individuals and families affected by human–elephant conflicts are usually paid compensation by government agencies, but the lack of adequate funding, delays in processing, and the tendency among many villagers to submit false claims complicate the problem. In 1992–93, as many as 3,856 persons were paid compensation for human–elephant conflicts in Meghalaya.

Beating tins, shouting, brandishing fires, and bursting firecrackers are the most common methods used for warding off elephants. However, these do not work in many places. Capturing and relocating live elephants was also considered as a measure to mitigate depredation. For example, 1,298 elephants were captured in Meghalaya from 1960 to 1981 and 12 elephants were captured in Assam from 1994 to 1995. Capturing these elephants has likely decreased depredation.

Construction of electric fencing has failed to eliminate conflicts in Hollongapar (now Gibbon Sanctuary) despite its initial success. When the fencing was erected, the elephants innovated an intelligent method of breaking fencing posts by holding the top of the wooden posts by their trunk and breaking at the middle by gently pushing their foot, thus avoiding the live wires. Digging trenches is expensive and difficult to maintain in areas such as NE India where heavy rainfall is common.

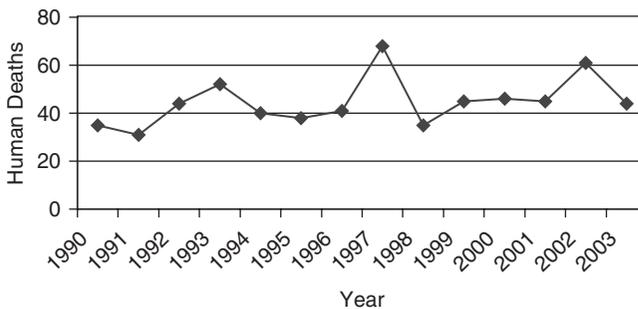


FIGURE 2 Human deaths due to conflict with wild elephants in Assam, India from 1990 to 2003.

Elephants are protected under the Schedule I of the Indian Wildlife Protection Act (1972), which is the highest level of protection accorded to any species in the country (GOI, 2003). The elephant is also listed as an “endangered” species by the IUCN (2002). However, it is often difficult to enforce regulations in remote areas because of the delayed information, inaccessibility, and problems of insurgency. Only about 25% of the elephant habitat is located within protected areas in NE India. Therefore, there is high potential for human–elephant conflict in a large amount of terrain.

The ultimate cause of the destruction of the elephants’ habitat in NE India is the rapid growth of the human population in this region. Unless the growth rate of human population is controlled, a lasting solution to human–elephant conflicts may not be possible. The human population in India is doubling every 30 years (GOI, 2002; Choudhury, 1999b).

Recommendations

The following recommendations are offered for mitigating human–elephant conflict in NE India. First, new protected areas need to be created. With only about 25% of the habitat of elephants within protected areas, there is an urgent need to create more protected areas. Although declaring an area as “protected” is not enough, it does offer a vital legal step toward conservation and reducing conflicts. Second, wherever possible, the existing protected areas should also be enlarged and fragmentation of protected areas should be discouraged.

Third, elephant migration corridors should be legally protected. Corridors used regularly by the elephants should be given legal protection. This is important because it is highly unlikely that all of the corridors will be combined into national parks or sanctuaries. Legal status should be granted in the form of a wildlife sanctuary where the corridors transect forestland. Problems arise, however, when corridors transect tea plantations, shifting cultivations, and human villages. Humans and elephants are mainly in direct conflict in villages. Conflict is less of a problem in other corridor areas because elephants usually migrate at night. It is recommended that provisions for “protected elephant movement corridors” be amended to the Indian Wildlife Protection Act. At tea estates and areas of shifting cultivation, the land should continue to be managed by the private owners, but the amendment would ensure that land-use changes do not occur in the corridors. At other places, the government can acquire strips of land under the Land Acquisition Acts and pay suitable compensation.

Fourth, poaching wildlife for trade and meat consumption should be strictly monitored. Anti-poaching staff need to be better trained and equipped, and penalties for poaching should be more severe. In addition, all unlicensed arms should be confiscated.

Fifth, shifting cultivation needs to be controlled/regulated. Although it is unlikely that this practice will completely stop, as it is a deeply ingrained lifestyle

and culture, measures should be taken to control it, especially near prime wildlife habitat and migration routes.

Sixth, encroachment should be strictly monitored. New encroachments should be discouraged or banned, especially in the reserve forestlands. Recent encroachments such as those within elephant habitat (e.g., Nambor and Balipara forests in Assam) should be evicted and restored.

Seventh, there should be a ban on commercial forestry/logging in NE India (similar to Thailand). Given the poor remaining tree cover in several parts of NE India, commercial forestry/logging in the remaining natural patches of forest should be discouraged. Uncontrolled cutting of the grasslands (e.g., Kobo chapori) should also be strictly monitored and controlled.

Finally, all areas currently designated as protected (e.g., National Parks) require consistent and adequate protection through effective patrolling and enforcement. Other measures include: (1) conservation education with active involvement of local and international nongovernmental organizations; (2) strategies for reducing depredation; (3) expeditious payment for loss of human life and damage to property; (4) reduced dependency of fringe villagers on the forest lands; (5) increased empirical research on the ecology, behavior, and movement of wildlife, especially elephants; and (6) an extensive review and rectification of some of the human development in NE India. These suggestions could potentially mitigate human–elephant conflicts in NE India.

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