ELEPHANT–HUMAN CONFLICT IN BAHUNDANGI REGION, JHAPA DISTRICT, NEPAL

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ABSTRACT

This study was conducted for 3½ months from January to mid–April 2013 in the areas of Bahundangi Village Development Committee (VDC) of Jhapa, east Nepal. Although Nepal has the second least number of wild Asian elephants in the world, some of the country's areas are mostly terrorized by resident and visiting elephant herds from time to time. And, Bahundangi VDC is one of such places where numerous conflicts between wild Asian elephants and human settlements are occurring frequently. The current study was done in order to identify such conflicts like loss of properties and loss of human lives there; and loss of wild elephants so that possible management measures could be developed in order to mitigate dispute for the betterment of both sides.

Key words: Asian elephant, Bahundangi, conflicts, Village Development Committees

Introduction: The district of Jhapa in east Nepal is one of the most menaced vicinity by frequently visiting wild elephants since a long time. This is because of its location at the south eastern end of the Nepalese border with India and it being an easy and first site for wild Asiatic elephants from India to visit. Within Jhapa district, Banhundangi is located at the eastern most part and is bordered with India towards east, Mechinagar Nagar Palika lies on the southern side, where as Shantinagar on the western side with Erautar and Jirmale on the northern side. This Village Development Committee (VDC) is one of the main areas, which is frequently attacked by visiting wild Asian elephants moving to and fro between Nepal and India. These beasts are found to raze crops and houses and occasionally killing human beings also. Furthermore, the area is supposed to be elephant country in the past with its natural settings suitable for elephant habitats (the area being part of the famous Char Koshe Jhaadi).

Figure 1. The study area.

The **Asian** or **Asiatic elephant** (*Elephas maximus indicus* Linnaeus, 1758) is the only living species of the genus *Elephas*, which is distributed in southeast Asia from India in the west to Borneo in the east. The wild population of Asiatic elephants declined markedly within a few decades and has been listed as endangered by IUCN since 1996 and listed it in Appendix I of CITES partly because of the habitat loss and degradation and partly because of habitat fragmentation making them isolated among their own populations (Choudhury *et al.* 2008). In Nepal it has been protected by the National Parks and Wildlife Conservation Act of 1973 (GoN 1972).

Asian elephants inhabit varieties of habitats like grasslands, tropical evergreen forests, deciduous forests, and scrublands. Over this range of habitat types elephants are distributed from sea level to over 3,000 m. In the eastern Himalaya in northeast India, they regularly move up above 3,000 m in summer at a few sites.The study area of Bahundangi lies at an average elevation of 253 masl with sub–tropical climatic conditions with annual mean maximum temperature of 32.05^0 C in summer.The elephants are classified as mega herbivores consuming up to 150 kg of vegetation every day. They are known to feed on 112 different plant species, most commonly of the order Malvales, and the legume, palm, sedge and true grass families (Sukumar 1989). The study area was highly vegetated with these species, which are highly palatable to the elephants. The elephants drink 80–200 liters of water a day. Adult females and calves may move about together as groups, but adult males disperse from their mothers upon reaching adolescence. Female captive elephants are known to have lived more than 60 years when kept in partly natural situations. However, in Zoological gardens, they die at a much younger age and are declining due to a low natal rate and high mortality rate (Sukumar 2003).

In 2003, the wild population of Asiatic elephants was estimated to be between 41,420 and 52,180 with an average of 46,800 individuals. In terms of number, India has the highest figure with 60.99% (28,545 individuals) and Vietnam having only 0.23% (110 individuals) whereas Nepal stands second last with 0.25% (120 individuals) of the total population (table 1).

A small herd of 10 to 13 elephants are known to visit frequently in the eastern fragmented forests of Char koshe jhadi. Furthermore, few herds of wild elephants in Chitwan and Bardia are also known.

Table 1. Status of elephant populations across south and southeast Asia.

SN	Country	Minimum	Maximum	Average number	%
1.	India	26,390	30,700	28,545	60.99
2.	Nepal	110	130	120	0.25
3.	Bhutan	250	500	375	0.80
4.	Bangladesh	150	250	200	0.42
5.	Sri Lanka	2,500	4,000	3,250	6.94
6.	Myanmar	4,000	5,000	4,500	9.61
7.	Thailand	2,500	3,200	2,850	6.08
8.	Malaysia	2,100	3,100	2,600	5.55
9.	Indonesia	2,400	3,400	2,900	6.19
10.	Laos	500	1,000	750	1.60
11.	Cambodia	250	500	375	0.80
12.	Vietnam	70	150	110	0.23
13.	China	200	250	225	0.48
Total		41,420	52,180	46,800	99.94

Source: Sukumar (2003)

Wild Asian elephant and human conflicts in eastern Nepal

The eastern Terai and inner Terai of Nepal were highly vegetated areas in the past and due to several social development in the country after 1950, most of these areas were cleared for human settlements. And, these development activities fragmented the elephant habitats. Precisely, the malaria eradication program; resettlement of hill people to the Terai; construction of Mahendra Highway (East-West Highway) linking the western and eastern parts of the country; and clearing of the forests for agricultural lands exploited the elephant territories. Furthermore, the human population collected elephant staple foods like bananas, bamboos, climbers and wild cassava from the remaining forests. Thus, in aspiration to get sufficient food, elephants are forced to come into the human settlements, which often led to the destruction of human properties instigating the conflict.
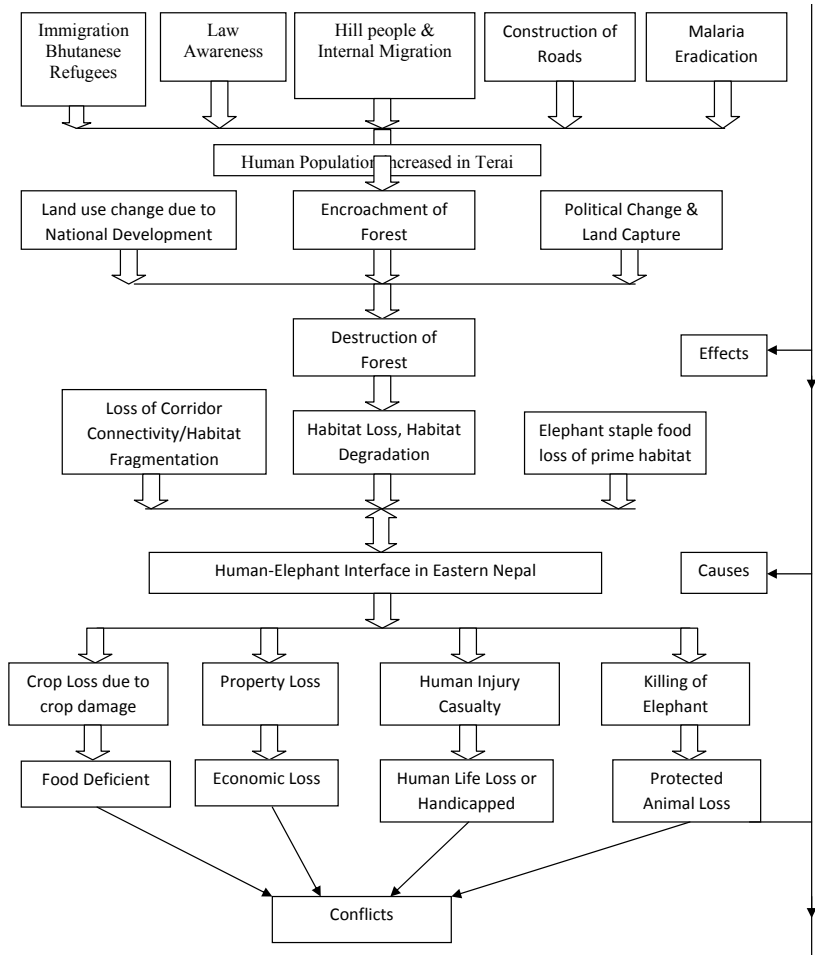

Figure 2. Issues on the status and conflict between elephant-human in Bahundangi.

STUDY AREA

Bahundangi area was selected as it has been frequently raided by wild Asian elephants. A residential small herd of 10 to 13 elephants are known to visit frequently and cause human properties damage from Jhapa to Udaipur districts and en route. Many agricultural products like paddy, maize, millet, cane sugar, banana, beetle nuts are known to have been damaged by several big herds of 50 to 74 individuals from India. It is not only the agricultural products but also other properties like houses, huts, carts, motorcycles and domestic households are heavily damaged after the rampage in Bahundangi. Many people are known to have been killed and handicapped.

MATERIALS AND METHODS

For the current study in Banhundangi, field works were conducted between January 2013 and mid–April 2013. People affected with elephant crop raiding were interviewed to collect data. Night visits were made to observe how the farmers guard their fields against wild elephants. Ten percent of the households in each ward of Bahundhangi VDC were randomly selected giving a total sample size of 400 households. Focus groups such as night guarding groups, school teacher, local institutions and community forest user groups were selected for discussion. To find out the relation between crop damage, property loss and distance from elephant habitats, a simple linear regression was carried out. Paired t–test were carried out to compare economic loss per household due to crop damage by elephant in 2012 and the economic loss due to the crop damage and property loss per household in 2011. A thorough rapid assessment in some other districts of Eastern Terai like Jhapa, Morang, Sunsari, Saptari and Udaipur was also done.

RESULTS AND DISCUSSION

Elephant distribution: On the basis of the field work, the big herd (60 to 74 individuals) with 20 tuskers and 5 to 7 calves had concentrated close to Bahundangi and the small herd (10 to 15 individuals) has been roaming from Jhapa to Udaipur districts.

Human beings killed by elephants: According to sources from VDCs of different districts of Nepal, the number of persons killed by elephants were 48 between1988 and 2012 (table 2).

Table 2. Number of persons killed by elephants in different districts of Nepal.

SN	District	Persons killed	Period killed	Killed/year
1.	Jhapa	20	1988 - 2012	0.83
2.	Morang	5	1988 - 2001	0.38
3.	Sunsari	10	1990 - 2000	1.0
4.	Saptari	3	1987 - 2005	0.167
5.	Udaipur	10	1987 - 1999	0.83
	Total 5 districts	48	1988 - 2012	2.0

Source: VDCs offices of different district.

Elephants killed by human: The Government of Nepal had killed five elephants in Jhapa district to protect the people's properties and lives (Smith and Mishra 1992, personal communication with farmers and local leaders). Muzzle loaded guns were used to kill some individuals and some elephants were killed in the encounters during agriculture crop guarding.

Recent data (1994-2007) elephant mortality in Nepal: Number of elephant mortality of Asian elephant in *in situ* and *ex situ* 1994-2007.
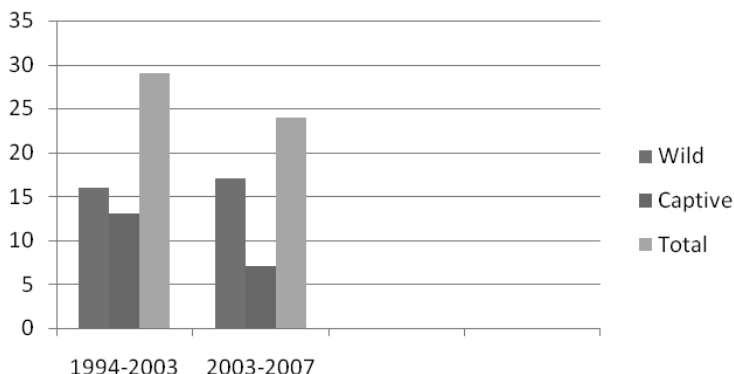

Figure 3. Elephant mortality in Nepal.

Economic loss due to elephants at Bahundangi

Frequency and seasonality of crop raiding: The incidences of crop damage in Bahundangi in the year 2012 were high in the months of July, December, June, November and August. Medium intensity of damage was recorded in the months of September, May, January and October, and low intensity occurred in February, March and April (table 3).

Table 3. Seasonal intensity of crop damage percentage based on questionnaire (N=120).

Month	High	Medium	Low
January	-	32.05	-
February	-	-	25.04
March	-	-	23
April	-	-	21.3
May	-	33.9	-
June	76.92	-	-
July	78.84	-	-
August	70.51	-	-
September	-	36.0	-
October	-	32.0	-
November	73.71	-	-
December	77.56	-	-

Management recommendations

On the basis of the present study, some management regulations could be proposed so that conflict of mitigation could be achieved between the wild Asian elephants and the human settlements in the Bahundangi area.

Considering this, each guarding group needs training on controlling and chasing elephants from their crop fields. The armed guards from police office and District Forest Office should be mixed in guarding groups in feasible areas.

The following measures can be implemented for controlling the wild elephants:

- Training the local people (farmers)/guarding groups.
- Scaring devices, but not harming the elephants.
- Night vision binoculars so that the approaching elephants can be spotted earlier.
- Equipping the local farmers with shot air guns for firing in the air only.

Physical Infrastructure development

- Guarding tower establishment.
- Tea leaves collection centre.
- Electrification in Bahundangi.
- Solar fencing along the Mechi river bank.
- Dyke construction along the Mechi river bank.
- Management of forest corridors can be give a thought for controlling the wild elephants.

Alternative crops: Alternative crops which are usually disliked by elephants could be promoted, for example tea cultivation instead of agricultural crops. Piloting effective bee–hives and cactus plantation in the elephant affected areas. Lastly but not least, management of forage for elephants in the nearby forests and community forests should highly be encouraged and initiated so that they are engaged more in that area than human settlements. Again these can be done by the user groups in collaboration with the government.

Responsible Institutions: The existing responsible institutions need to work harmoniously with each other in order to minimize the conflicts that harm on both sides. Relocation of people from the forest and or nearby forests to appropriate human settlements is to be encouraged. Local level trans–boundary cooperation between India and Nepal should be further increased to make it every month in the crop season. A serious thought should be given to establish an additional protected area in eastern Nepal. "Elephant people interface project" in Jhapa district needs to be launched along with awareness program among the farmers. By now, District Forest Office of Jhapa has already received a project from government on the similar head.

Bahundangi Village Development Committee in Jhapa, east Nepal has been undoubtedly recognized as a place where conflicts between wild Asian elephants and human settlements are occurring repeatedly. The current study has identified conflicts like loss of properties and human lives in one hand; and loss of wild elephants on the other hand. Appropriate mitigations are mandatory should we deem to reduce human-elephant conflict.

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