

## Measures Adopted to Combat Migratory Elephants in South West Bengal Forests

Ajit Kumar Santra, Ashis Kumar Samanta and Subhransu Pan

*Department of Livestock Production and Management, West Bengal University of Animal and Fishery Sciences, West Bengal, India*

### Introduction

The tangible problems caused by both migratory and resident elephants in vast areas of South West Bengal have several dimensions on local people and the habitat. Man-elephant conflict sometimes turns to forest department-villager conflict. General opinion of the villagers as well as other sections of the society is that it is the sole duty of the forest department to keep the elephants confined within the forest area. After suffering losses, villagers wrath fall on forest staff especially those working at field level.

Since 1987 it has been a regular phenomenon of staff being assaulted or injured by irate villagers. It is especially noticed during elephant driving operation. The attack on the forest ranger of Sonamukhi by the villagers surrounding the Hamirhati forest beat on 19<sup>th</sup> September 2001 is just an example of worth mentioning. Road blocked and *gherao* of local forest staff have become a routine affair during September to February in that region. Other major development activities of forest department are severely hampered as most of the staff in the elephant range become busy in managing problematic elephant herds during September to March. Forests in some areas have been cleared by desperate villagers, to deny shelter to the elephants near the village. Many farmers even have left their land without cultivation to avoid damage by elephants.

Increasing drain of public money for *ex-gratia* payments towards losses of human life, agricultural crops, livestock and other properties is one of several dimensions of the problem. There is also considerable expenditure from non-plan budget for purchasing kerosene, diesel, crackers, jute etc. to meet cost of elephant driving. Expenditure on a *hoola* party consisting of 50 individuals is fixed around Rs. 10,000-

15,000 per night. Moreover, it has also been noticed that often villagers harvest their crops prematurely, especially rice, potato and cabbage because chances of attack are increased once the crops are mature. This reduces the value of the harvest even if elephants do not eat it.

Various short and long-term measures are being adopted to mitigate problems from migratory elephants, when they move into the eastern part of the Kangsabati river. These include use of barriers, capturing of wild elephants, using trained elephants, scaring and habitat development works. However, none of these measures either isolated or in combination, is able to record any tangible impact towards a permanent solution to this menace.

### Materials and methods

The study was conducted from December 2000 to February 2003. The study area is located between latitudes 20°25' to 23°15' North and longitudes 86°30' to 87°49' East and is spread over the districts of West Midnapur, Bankura and Purulia. Geographical area is about 11,000 km<sup>2</sup> of which forests spread over 1850 km<sup>2</sup>. The general topography ranges from 200 m to 670 m. The soil is primarily red sandy lateritic and alluvial type with red and black solid in a few pockets (Ghosh 1992). The maximum temperature fluctuates between 42°C and 46°C during summer, while minimum temperature varies between 8°C and 13°C during winter (Singh *et al.* 2002). The average rainfall varies from 1180 to 1428 mm. The overall vegetation type is Tropical Dry Deciduous dominated by Sal (Champion & Seth 1968). Various measures adopted to mitigate migratory elephants were gathered from observations, local residents and Forest Department.

## Results and discussion

### Barriers

Since 1987 temporary electric fencing using two strand galvanized wire and energizer were erected in various elephant prone areas by the forest department in order to check and guide the elephant herd movement to desired directions or drive back to Dalma, the home of migratory elephants. Twelve energized fence lines were operating in various sites covering an area of 222 km. Majority of fences were erected in West and East Midnapur forest divisions. In East Midnapur forest division where the herds used to settle for most of the time during their stay, energized fencing was temporarily erected in 1987 to direct the herd movement towards Jharkhand border and to prevent their future entry deep into the south-western tract of West Bengal. This temporary attempt in directing elephant herds to their original home was successful. The fence barrier however is dismantled as and when considered necessary, as the nature and extent of elephant depredation and movement pattern do not always demand a permanent fence barrier.

### Scaring

Scaring elephants by specially equipped driving parties (locally called *hoola* party) with the assistance from forest department staff is a local innovation (Fig. 1). The *hoola* is made of 3- 4 m long pole of iron or sal wood. The tip about 0.6 m in length of the pole is wrapped with torn jute bag and finally tied with iron wire. It is then soaked with mixed oil containing diesel and burnt engine oil. On sighting an elephant herd, the tip of the *hoola* is ignited and persons holding the *hoolas* in their hands charge the animals. A bright flame is caused as a result of wind action. The *hoola* party approaches the herd at very close quarters. Each encounter lasts for about 10-15 minutes as the fire dies out on exhaustion of diesel or pulpy wood portion. Large group of people with crackers, torches and beating drums along with the *hoola* charge the animals. Local villagers were occasionally supplied with crackers, kerosene oil, torchlights and burnt engine oil by forest department for organizing

*hoola* parties. Driving of elephant herds by this method is found to have limited success. Such driving however caused more damage as the scared elephants during hurried movement extensively trampled field crops. Affected farmers targeted forest staff in revenge demanding compensation.



**Figure 1.** *Hoola* party in Kuilibandh forest ready for elephant driving operation.

### Chasing and capturing

Capturing wild elephants by trained elephants was practiced in South West Bengal. In this method wild elephants are chased by specially trained elephants with their mahouts. They noose elephants from backs of trained elephants and capture them. The trained elephant then drags the captured elephant out of the forest. Dalma herd in East Midnapur forest division was first attempted to be driven back to its original home in 1987 with the help of trained elephants brought from North Bengal. During 2001, two trained elephants with their mahouts from a private owner of Assam, and one trained elephant with her mahout from Forest Department, Government of West Bengal, were brought to scare and to catch elephants from the migratory herd. Two subadult elephants were captured in Sonamukhi forest range of Bankura (north) forest division. The captured elephants were kept for formal training and subsequently were sent to North Bengal for further training and work. This method was found to have limited effectiveness. Occasionally the elephant herd splits into 2-3 subgroups during the operation. They moved in different directions resulting in ineffective control over the herd. Their forced movement led to extensive damage of crops, houses and other properties. In most cases the

operation could not be carried out very accurately due to mahout's lack of knowledge of the terrain. As a result expected success often could not be achieved.

#### *Chemical immobilization*

Chemical immobilization of a big tusker followed by trimming off part of tusk (Fig. 2) was carried out in order to put fear of *koonkie* (trained elephant) among the herd so that the process of driving would be easier. However, further observations revealed that it had no effect on the herd as the whole migratory herd remained for longer periods in the Sonamukhi forest range of Bankura (north) forest division. During the capture operation a wireless network was established to transmit information regarding movement of elephants.

#### *Habitat development*

Habitat improvement programs were taken up through plantation of food plants liked by elephants, cultivating fodder crops, conservation of water holes and provision of salt licks. Initially habitat improvement programmes were undertaken on the western side of the Kangsabati River to induce the elephants to spend more time in the tri-junction of Midnapur, Purulia and Bankura districts covering 400 km<sup>2</sup>. Food plants liked by elephants such as banana, bamboo, jackfruit etc were grown in various forest areas viz. Uporsole, Ranibandh, Jhilimili and Goaltore. However, majority of the food plants were found either uprooted by the villagers or marginally utilized by both migratory and resident elephants. Many bamboo plants, for example, were uprooted by the local people in the Kankrajhore area. The reason may be that plantation of elephant food plants would further attract elephant herd in the forest.



**Figure 2.** Trimming of tusk of an elephant in Bankura forest area of South West Bengal.

Paddy, maize, hybrid napier and bajra were grown in various forest patches (e.g. Joypur, Bishnupur, Garbeta and Lalgargh) as fodder crops. Fodder plantations have succeeded in attracting elephant herd and inducing them to spend marginally more time in the planted fields. However, the efforts of the forest department have been spoiled by a variety of biotic interferences such as grazing of livestock, collection of fodder and unregulated movement. 200 hectares of land have been used for plantation of elephant's preferred food plants and fodder during 2000-2001.

Moisture conservation programs through construction of water tanks has also been undertaken in many forest areas viz. Uthan Nayagram, Garbeta, Bankadaha, Sonamukhi, Hoomgarh and Arabari. Two hundred hectares of land have been covered under this program. However, majority of water bodies dried up during summer months. This is one of the reasons for resident elephants frequently visiting the vicinity of human dwellings. Forest areas of Kankrajhore were enriched with salt-licks in order to attract the elephant herd on the west bank of the river Kangsabati. Two hectares of land were covered under this program during 1993-1998. Habitat improvement programs have not fully succeeded in keeping the elephant herd

within designated forest areas of South Bengal. Small scale operations may be one of the reasons. The inherent propensity of migrating elephants to prefer agricultural crops as winter food is the prime reason. This can be supported by the fact that the habitat in the desired winter range to the west of Kangsabati river is well wooded with plenty miscellaneous species and water. Therefore, present study reveals that it would be hardly possibly to change their dietary habits.

Various measures as mentioned earlier were adopted in combination for mitigating the problem. However, no single method can be effective in all cases. Each method has its own limitations.

The electric fencing did not work due to social unacceptability, management problems, elephant's intelligent practice towards uprooting or breaking poles and topography of the terrain. Fences tend to be very much disturbed where people on one side have to bear the brunt of higher intensity of elephant depredation because of erection of such barriers to protect the people of the other side. Erections of such fences along the Jharkhand–West Bengal boundary thus have become a sensitive issue. Initiating community participation is a very important step regarding fence installation though it often goes against the interest of the local people in terms of livestock grazing and free movement. Villagers often used wooden posts of electric fencing as firewood. However, mutual agreement and understanding can protect stealing of fence materials. Local people can be involved in fence maintenance and patrol. Defective installation of fence line, their improper and inadequate maintenance and constant monitoring are some of the important management problems in electric fencing. Elephants are often observed to test the fence-line with broken tree branches (Palchowdhury 1994). On receiving electric shock elephants moved away from that site and walked along the fence line making several futile efforts to cross the fence. Thouless and Sakwa (1995) also observed that electric fencing may work well or may not work for a long period. Fencing is not a physical barrier but merely a psychological bluff (Sukumar 1992). Moreover, construction cost and recurring expenditure for

maintenance are the major problems with electric fencing (Schultz 1988; Taylor 1993).

Driving away elephants physically by *hoola* parties using crackers, search light, fire etc. achieved limited success. Elephants were found to break into subgroups during driving resulting in multiplication of the problem in different localities. Such driving is successful when the breakaway groups unite to form a herd and the paddy fields are cleared after harvesting the crop. Forest officials often brought expert *hoola* party from outside ignoring involvement of local people in elephant driving. As a result an inter-party non-cooperation was observed during driving of elephant herd from one patch of forest to another. However, *hoola* parties are by and large capable of providing immediate relief to the villagers. Use of trained elephants to drive away the wild herd has been of little success. Trained elephants were found not effective against big solitary bulls. Moreover, regular chase without capture makes wild elephants fearless (Barua 1995). High cost of transport and maintenance of trained elephants, to places where the wild elephant herds move very fast sometimes makes this method ineffective.

Chemical immobilization followed by capturing of five elephants was carried out in 1995 at Arabari forest. Two subadults were caught by trained elephants during 2001. Both the operations were found not much useful to put fear of *koonkies* among the herds.

Habitat development programs through small scale plantations of elephant's food plants and fodder grasses were practiced. However, such efforts have been frustrated by constant biotic interference in the forms of unregulated fire, grazing and illegal collection of firewood and fodder. As a result migratory elephants were marginally attracted to the so called developed habitat. The growing of fodder inside the forests becomes meaningless unless it can be protected against grazing (Lahiri-Choudhury 1975). Moreover, cultivation of fodder on some 200 hectares in large number fragmented plots hardly serves any useful purpose.

## A realistic approach

It is obvious that migratory elephants in South Bengal (Fig. 3) have become a problem population. Till now there is no satisfactory way to address the problem. With constant threat, local villagers are becoming more and more hostile and intolerant towards elephants. Many of the proposed solutions are very expensive and time consuming and yet do not guarantee a better future. Interventions that reduce human-elephant conflict significantly in one area may be completely ineffective in another area (Hoare 2000). There is no universal recipe for controlling problem elephants but a range of measures in combination can be employed to mitigate harmful effects on people and their property (Taylor 1993; Hoare 1995). Success of such actions is entirely dependent on area specific situation, cooperation of the local people etc. where elephants are to persist, their needs will have to be integrated with those of people (Sukumar 1991). Capturing of elephants needs to be accepted as an essential tool for management of overpopulated and problematic wild elephants only (Bist 2002).



**Figure 3.** Elephants from Dalma forests on their routine migration to South Bengal.

The proposed measures are only directed to reduce the local people's dependency on forest and it will help in maintaining or conserving the elephant habitat. But does it guarantee that provided with a 'copy book' habitat, elephants will not venture out from their cover? Possibly, it cannot be denied that there exists some 'tactic' force(s) pulling out the elephants from their natural habitat to fulfill certain biological requirements (e.g. food, investigation, exploration, natural instinct of movement etc.). However the following development program

will uplift the socio-economic condition of the people living the vicinity of forest resulting in reducing the hostile attitudes towards the solution of human-elephant conflict.

### *Animal production*

It can be given more importance to those areas where livestock play an important role in livelihood generating for farmers. Some areas such as Belpahari, Banspahari, Ranibandh and Ajodhya may be identified as livestock development zones. Improved livestock production system can be applied in order to reduce their dependency on forest.

### *Improvement of sabai grass*

Sabai grasses are mainly used for making paper and rope. It has high economic value in the market. However, the producers from Kankrajhore, Nayagram, Chandabilla, Jhilimili and Ranibandh areas are not getting proper price for the product. Therefore a marketing facility should be set up. This would facilitate the farmers in getting remunerative price. The cultivation of sabai grass can be encouraged on their own land.

### *Horticulture*

There is enough scope for development of fruit plants (e.g. guava, lemon, papaya etc.) at Ajodhya, Bagmundi and Matha forests areas. Tasar cultivation can also be encouraged in these areas.

### *Distribution of LPG and solar light*

Distribution of LPG can be experimentally started in some forest fringe villages so as to reduce their dependency on firewood. Similarly solar light is capable of diverting attention of local people away from forest.

### *Elephant management zone*

An elephant management zone (Mayurjharna project) of 1800 km<sup>2</sup> area in the tri-junction of Orissa, West Bengal and Jharkhand states has been proposed. An area of 400-500 km<sup>2</sup> will cover the tri-junction area of Purulia, Bankura

and West Midnapur districts of West Bengal. About 150 families have to be resettled under this project. As villagers are traditionally close to nature and forests, they would prefer to stay in villages close to forest areas. Therefore, resettlement programs have to take into consideration the socioeconomic and political situation of the area.

### Acknowledgements

The authors are thankful to many Forest staff and local people for their cooperation and encouragement during the study in South West Bengal.

### References

- Barua, P. (1995) Managing a problem population of elephants. In: *A Week With Elephants* Daniel, J.C. & Datye, H.S. (eds.) Proceedings of the International Seminar on the Conservation of Asian Elephant, Bombay Natural Hist. Soc., New Delhi. pp. 150-161.
- Bist, S.S. (2002) An overview of elephant conservation in India. *Indian Forester* **128**: 121-136.
- Champion, H.G & Seth, S.K. (1968) *A Revised Survey of Forest Types of India*. Manager of Publication, New Delhi.
- Ghose, A.K. (1992) The state of West Bengal: An overview. In: *State Fauna Series 3, Fauna of West Bengal, Part 1*. Zoological Survey of India, Calcutta. pp. 1-26.
- Hoare, R.E. (1995) Options for the control of elephants in conflict with people. *Pachyderm*, **19**: 54-63.
- Hoare, R. (2000) African elephants and humans in conflict: the outlook for coexistence. *Oryx* **34**: 34-38.
- Lahiri-Choudhury, D.K. (1975) *A Report of the Problem of Elephant Depredation in Jalpaiguri Forest Division and Part of Madarihat Range of Cooch Behar Forest Division*. West Bengal Forest Department, West Bengal, Mimeo.
- Palchowdhury, S. (1994) Control of wildlife population with energized fence barriers in West Bengal. Paper presented at the *Workshop on Wildlife Control* organized by WII held at Shibpuri National Park in 1994.
- Scheltz, B. (1988) *Constructional Maintenance of Power Fences for Indian Wildlife*. Field Document No. 8, WII, Dehradun.
- Singh, A.K., Singh, R.R. & Chowdhury, S. (2002) Human-elephant conflicts in changed landscapes of south west Bengal, India. *The Indian Forester* **128**: 1119-1132.
- Sukumar, R. (1991) The management of large mammals in relation to male strategies and conflict with people. *Biological Conservation* **55**: 93-102.
- Sukumar, R. (1992) *The Asian Elephant: Ecology and Management. Second Edition* Cambridge University Press, New York.
- Taylor, R.D. (1993) Elephant management in Nvaminanyi District, Zimbabwe: turning a liability into an asset. *Pachyderm* **17**: 19-29.
- Thouless, C.R & Sakwa, J. (1995) Shocking elephants: Fences and crop raiders in Laikipia districts, Kenya. *Biological Conservation* **72**: 99-107.

Corresponding author's e-mail:  
santra\_ajit@yahoo.com