Chapter 8
Conclusion

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Abstract This is the concluding chapter of the book. It portrays different aspects of human suffering caused by conflict with elephants and suggests ways to combat the situation. Some thematic maps have been prepared depicting the villages affected by elephant attack. Maps of increased crop damage have been prepared and compare decadal data. Attempts of the forest department and the problems it faces are also depicted. The existing land use pattern is also responsible for the situation. Thus, we considered all these factors while applying any policy to improve the situation. Ultimately, people's support is essential for any strategy or plan to be successful. After analysing the typical situation of the study area, we proposed some mitigation and management measures. Some of the management measures have already been applied to similar cases at the national level. However, some significant proposals that are very case-specific should be useful at a local level only. The route of elephant migration and temporal route shift that we have prepared may be useful not only to the forest department but also to the affected communities. All the results of each chapter are written in the form of major findings in this concluding chapter, in an effort to draw some practicable management and peaceful coexistence between humans and elephants in the study area.

Keywords Damage map • Major findings • Management strategy • Mitigation measures

8.1 Introduction

The consequences of human–elephant conflict have become crucial for wildlife conservation. Nonetheless, they are also a major socio-economic and political issue and a big challenge to the nation too. Once the elephant was viewed with pride, was seen as a status symbol, had a cultural heritage and was worshipped by humans, but now it has become an object of conflict. The human–elephant relationship of respect has eroded into one of intolerance. The number of affected people and volume of damage have increased considerably. Forest departments have made several initiatives to address the problem. Payments ex gratia have been extended to the victims for injuries, death, crop loss, property loss and so forth, but this compensation scheme has not been successful because of procedural complexes within the system. At the same time, we have found that compensation schemes are not the right option to resolve the problem of human–elephant conflict. The construction of electrical fences or trenching along the forest margins has been built to restrict elephants within the forest area. But in the highly fragmented forest, it is not practicable to create and maintain such a fence. People need to enter the forest to collect fuelwood and non-timber forest products. It has also been found that people often break the fences and sell the wires. Thus, proper supervision is needed. Elephant calves may fall into the trenches and get stuck, which is dangerous. In such a situation, the herd becomes more violent and causes additional damage. Hence, people demand more sustainable and long-term solutions to the issue of human–elephant conflict.

Plate 8.1 Elephant calf trapped in man made tank

8.2 Mitigation Measures

Issues of elephant migration have become a regular phenomenon in Panchet Forest Division since 1987. The problem has three different dimensions: damage or loss of life or property of the villagers; damage or death of elephant population; and vulnerable situation of forest staff because of assault by the villagers and attack by elephants during the chasing of elephants. In their own way, villagers try to resist elephant attacks on their crops, and the forest department—with its limited strength—tries to combat the situation. The result is an increasing drain of public money for ex gratia payments, but the situation remains unchanged. The villagers and forest department have tried the following methods, described next: scaring and driving the herd away; crop guarding; throwing stones and using bows and arrows; wild elephant capture; chemical immobilisation; and habitat development.

8.2.1 Scaring and Driving the Herd Away

Elephants are driven away by scaring them. It is done by a specially trained *Hullah party* by forest department personnel and villagers. A *hullah* is made of a 3–4-m-long pole of iron or *sal* wood. The tip is wrapped with jute or cloth and finally tied with iron wire. Then it is soaked with kerosene or diesel. The *hullah party* leader then ignites the tip of the hullah and participants chase the elephant herd until they drive them away in the desired direction. During the chase, close proximity to the herd may be dangerous to the villagers too. Along with the *hullah,* they use firecrackers and fireballs supplied by the forest department. However, crop fields are trampled and damaged by the herd during the chase.

Plate 8.2 Hullah pati chasing elephant to drive elephant

8.2.2 Crop Guarding

Crop guarding is done by the farmers individually or collectively. They usually arrange to scare elephants from the huts made near the field. Noises made by the people in the fields may discourage elephants from raiding crops and thus damage could be minimised.

Plate 8.3 Crop guarding at night by the villagers

8.2.3 Throwing Stones or Arrows

Activities such as shouting and throwing stones or shooting arrows are rather reactive and confrontational (Fernando 2008b). These kinds of attacks on elephants make them more aggressive. All these traditional methods adopted by the villagers are only able to tackle the problem for the time being. Repetitive application of these traditional methods ultimately fails because either the elephants become habituated to these methods or they are not effective to protect against elephant attack. The constant failure of these traditional methods makes the villagers intolerant of elephants and more likely to use harmful and lethal methods. However, the forest department has taken some measures at the local level through capturing elephants, chemical immobilisation and habitat development.

Plate 8.4 People scaring elephant part to drive them back to the forest. *Source*: www.bankuraforest.in

8.2.4 Wild Elephant Capture

Capturing wild elephants is done by trained elephants, or *koonkie*. Wild elephants are chased by trained elephants with their guides, called *mahauts*, who capture them and drag them out of the forest. Dalma elephants were captured and driven back to their original habitat in 1987 with the help of trained elephants brought from North Bengal (Santra et al. 2007). Today this method has limited effects. When Dalma elephants initially started migrating to southern West Bengal, the number of elephants and herd size were small. Today, however, both the number of elephants in a herd and the number of herds have increased. Originally, there were 40–42 elephants in a herd, but now the number has increased to 70–80. So when the trained elephants chase the herd, the herd splits into two to three subgroups that move in different directions and become unmanageable to capture.

8.2.5 Chemical Immobilisation

This process of capture usually applies to rogue elephants or those who are creating problems, that is, problem elephants that cause severe damage in forest fringe settled areas. In this method an anaesthetic drug is administered to the problem elephant and the unconscious elephant is translocated to some other place. But this method is costly and requires more people to carry out.

8.2.6 Habitat Development

Habitat development is probably the most practical, rational method to address the issue of human–elephant conflict. Habitat improvement programs involve growing food plants that elephants like, planting fodder crops, creating water holes, salt licks and more. These activities can improve the quality of monospecies-dominated forest patches of the study areas, which serve as elephant habitats.

Creating a buffer zone with secondary vegetation like bamboo and grasses may be helpful to check the habitat of roaming elephants in the vicinity of the forest. Food crops preferred by elephants, such as paddy, maize, hybrid Napier and Bajra, are grown in various forest patches of Joypur and Bishnupur (Santra et al. 2007). The forest department planted elephant-preferred food plants and fodder on 200 ha of land. In addition, the forest department excavated several tanks within the forests to supply water for elephants within the forests. Most of the water tanks become dry during the summer season.

Habitat development and improvement in elephant-affected areas yielded effective results, but in most cases these improvement programmes are implemented on a local scale and in very few instances. It requires the co-operation of the local villagers to maintain and supervise the habitats created. Thus, the government should support these kinds of initiatives on a broader scale for proper management of the problem of habitat destruction.

Plate 8.5 Plantations by the forest department for habitat improvement

8.3 Managing Human–Elephant Conflict at the National Level

Elephants have co-existed with humans since time immemorial. With the advancement of civilization, however, this co-existence has turned into conflict. It is therefore a challenge for the nation to provide proper management plans so that the co-existence relationship rejuvenates. The largest herbivore needs living space, food and water. Scarcity of these needs within the forest area compels the elephants to go outside the forest in search of these needs, thus giving rise to conflict with humans. As a response, the government has created several programmes to overcome the problem of human–elephant conflict. Project Elephant is one such programme that focusses on the issue of elephant welfare.

8.3.1 Project Elephant

Project Elephant was launched by the government of India in 1992. It is sponsored by the Ministry of Environment and Forest (MoEF). The main aim of this project is to provide financial and technical support to the elephant range states of India for protection of elephants, their habitat and corridors and especially to address the issue of human–elephant conflict. It also promotes the welfare of captive elephants (Doyle et al. 2010).

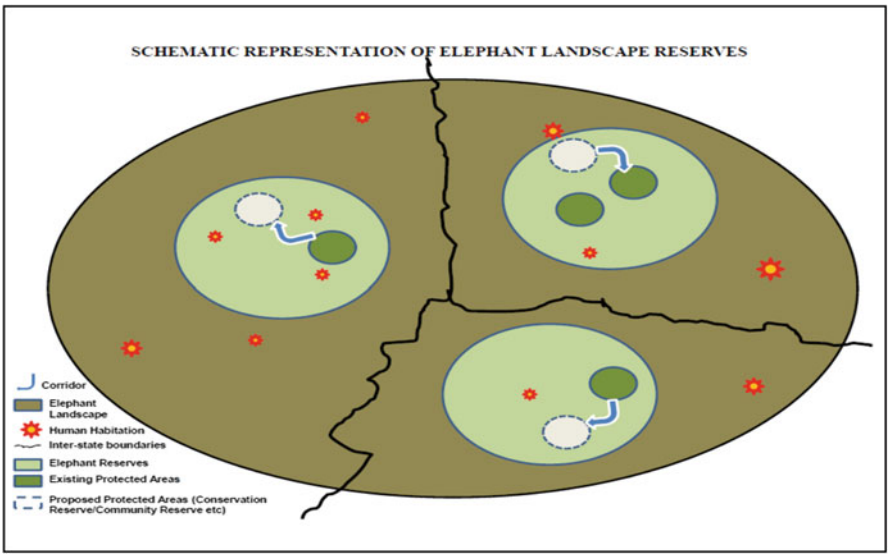


Fig. 8.1 Schematic representations of elephant landscape reserves

The prime objectives of Project Elephant are as follows:

- Ecological restoration of existing natural habitat and migratory routes of elephants
- Development of scientific conservation plan for elephant habitat
- Promotion of measures for mitigation of human–elephant conflict
- Measures to prevent poacher in elephant habitat zones
- Public awareness and education programme
- Eco-development
- Research on elephant management and veterinary care
- Technical and administrative assistance to the states to fulfil the above objectives

It is a central government–sponsored project and provides financial, technical and scientific assistance to states that have a large elephant population. As of this publication, there are 32 elephant reserves in India. For ease of work, a task force was formulated following the National Tiger Conservation Authority (NTCA) and named the National Elephant Conservation Authority (NECA); its role is to look after these identified elephant reserves of India. Emphasis was given on improving these habitats. For instance, in 8th Five Year Plan, Rs. 23 Crore was allotted, which was increased to Rs. 81.99 Crores in 11th Five Year Plan. In 12th Five Year Plan, this committee recommended to allocate Rs. 475 Crores for habitat development, elephant protection, corridor securement, monitoring, research, management and welfare of captive elephants (Fig. 8.1).

The task force has identified that the level of human–elephant conflict is very serious in West Bengal (Rangarajan et al. 2010). More than half of the expenditures was incurred mitigating human–elephant conflict and 15–20 % was allocated for ex gratia compensation for crop, life and property loss. Thus, to resolve the problem, development and improvement of habitat are more important for this area.

The task force has also recommended studying elephant behavioural ecology before implementing any long-term strategy or policy for the study area. Keeping in view the issues of human–elephant conflict in the face of population increases and expansion of settlement within or near the elephant habitat, they recommended a plan for the peaceful co-existence of humans and elephants sharing a common space.

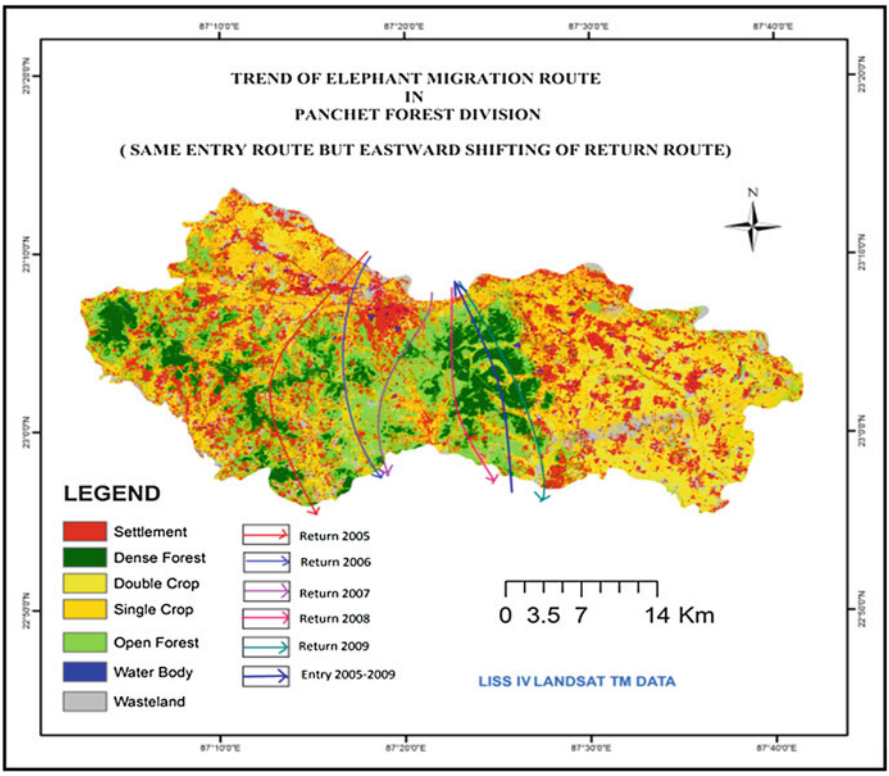
8.3.2 Community Involvement

To reduce the level of human–elephant conflict, it is essential to elicit people's support because any strategy or plan will not be successful without community support. Establishment and maintenance of barriers should be supervised by community members themselves. Regeneration of fodder crops or forest cover is only possible when the local community is involved with the programme. The local body, either the gram panchayat or gram sabha, may take the role to supervise these barriers. The survey indicated that a gap exists between the thoughts of the villagers and those of the forest department. The government has to take initiative in involving local people before implementing any strategic plan. Regular meetings, workshops and training programmes should be organized to make people aware of the behavioural patterns of elephants and different dimensions of human–elephant conflict.

8.3.3 Land Use Planning

Issues of human–elephant conflict have increased with changing land use. The problem is severe in the human-modified environment, where human settlement exists and the land has become fragmented. To manage the problem, we are developing regulatory mechanisms that reduce habitat loss and stop the fragmentation and degeneration of forest cover. Thus, habitat protection is urgently needed to readdress the situation. Several techniques can be applied for this purpose, as follows:

(a) Monitoring habitats using satellite imagery, one can easily see the temporal variation of vegetation cover and identify settlement growth by comparing satellite images of different periods.
(b) Corridors used by the elephants can be well demarcated on satellite images. Even shifting of corridors within a small area can be demarked. In the study area the shifting migration route is well demarked on the land use map. The cause of shifting can also be assessed.



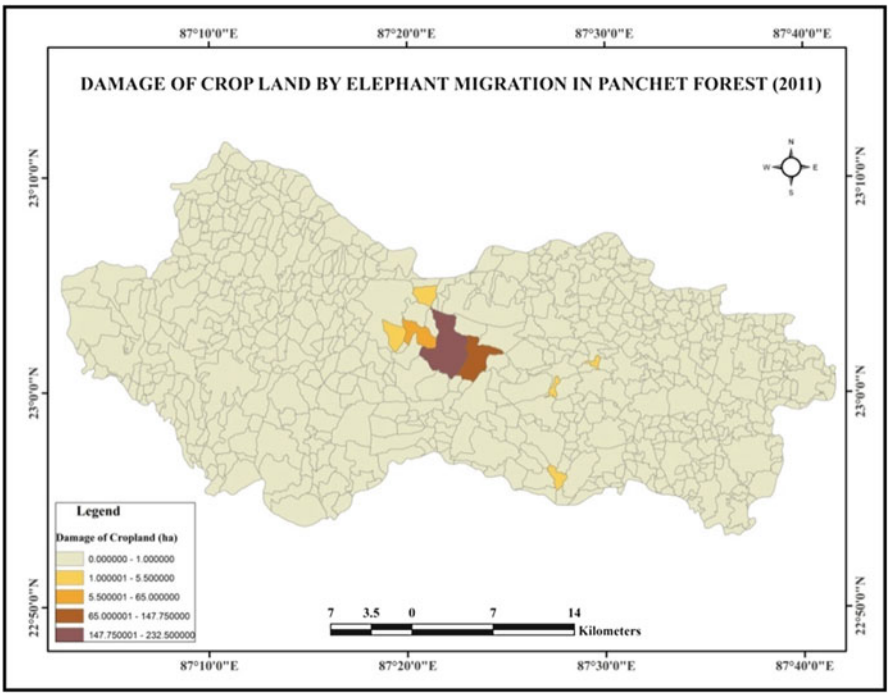
Map 8.1 Trend of elephant migration route, 2005–2009

(c) Plantation of chilli, capsicum, turmeric or arum as a biological border along village boundaries can be fruitful. The pungent smell of capsicum and chilli prevents elephants from entering the village. Turmeric is cultivated in some elephant-affected areas of Jharkhand. It has been successful to some extent. In some West Bengal locations, arum has been cultivated to restrict the movement of elephants.

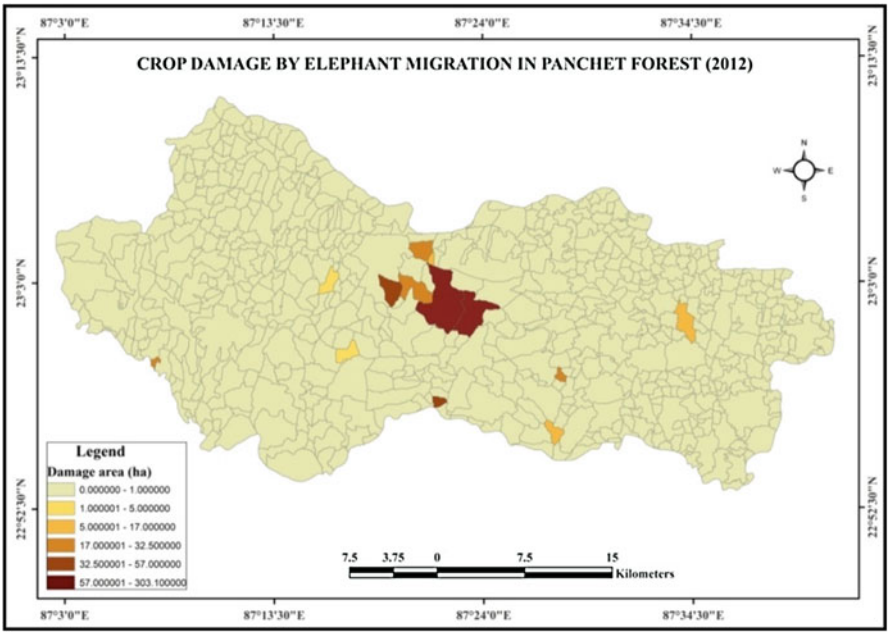
(d) Direct monitoring at the beat and range level will be very helpful to track the routes of elephants.

(e) Enforcement of law or legal application is needed in the places where the boundary is vague, disputed or encroached by human beings, which creates problem for management.

(f) A proper environmental impact assessment will be helpful to know the specific characteristics of land use planning in a conflict zone. It is necessary because every place has its own characteristics that should be taken into consideration before implementing any planning proposal.



Map 8.2 Damage map of Panchet Forest Division, 2011



Map 8.3 Damage map of Panchet Forest Division, 2012

The present study tries to cover almost all dimensions related to the human–elephant conflict. After analysing the answers to the questions raised at the beginning of this thesis, we are able to outline some results in the form of major findings.

8.4 Major Findings

1. Degradation and fragmentation of habitat have been caused by anthropogenic activity that includes agriculture, expansion of settlement, construction of road and railway lines, mining, encroachment of the forest fringe areas and establishment of poultry farms within the forest fringe areas.
2. The number of migratory elephants has increased since 1987. Initially, one herd used to come, but now three to four herds consisting of more than 70 elephants come into the study area.
3. The number of days the elephants stay in the study area is also increasing. Initially, it was only 1 or 2 months, but now it has increased to more than 6 months.
4. The number of residential elephants has also increased. These residential elephants are isolated from the herd. They create more problems throughout the year.
5. A temporal shifting of the entry and return routes of these migratory elephants has taken place. They have shifted their return routes towards the east, where the land use is dominated by agricultural lands.
6. A seasonal pattern of depredation is seen. During October–February, or during the harvesting season, depredation is frequent. The incidence of human–elephant conflict is severe during this time of the year.
7. The local communities primarily consist of marginal agriculturists. The level of education is very low among community members. A low level of awareness among local people has made the problem more complex.
8. Loss of life and crop has increased gradually.
9. There is a gap between the measures taken by the forest department and the local people's demand to combat the situation. Steps taken by the forest department in most cases are short term, but people demand a long-term solution.
10. Forest departments spend most of their grants paying ex gratia compensation to people who have suffered a loss. But people view the compensation as being insufficient to cover the loss.
11. Locals do not rely on the forest department to combat the situation because of the department's poor performance. Changing the locals' attitude towards forest department personnel in the field is another dimension of the problem.
12. Changing behaviour among both the migratory herd and residential solitary elephants has been found. Elephants have become more aggressive and attacking towards people and damage more crops and properties in the study area. At the same time, people's attitude towards elephants has also changed. A relationship originally built on respect has been transformed into one of fear and conflict.

8.5 Conclusion

Our research work is a humble submission to address the increasing tension between humans and elephants in Panchet Forest Division. We have tried to find the actual causes of migration of Dalma elephants to Panchet areas. Focus has been given to ecological and environmental causes along with socio-economic factors. The number of elephants coming into the study area and the length of their stay there have increased in the years since 1987. The population density of this area has also changed in these years. As a result, the area under settlement and agricultural land cover have also changed. The main cause of human–elephant conflict is the alteration and modification of land use patterns. Degraded areas or wastelands have been regenerated under the Social Forestry Programme. Successful implementation of social forestry not only increases the forest cover but also creates a corridor in between Dalma and southern West Bengal, which helps the migratory elephants take shelter in those patches. Initially, it was an infrequent event, but later on the migration became a regular event in the study area. Easy availability of food in the agricultural lands attracts elephants. Thus, the issue of human–elephant conflict has become a serious dimension in the study area. Each year forest departments have to compensate the losses with a huge amount of money given to the victims. But the severity of the problem remains unchanged. Local people, in their own way, are trying to handle the situation, while the forest department, with its limited infrastructure, is struggling to cope with the situation. Recently, the forest department has started to improve the quality of the habitat by planting fodder crops within and near the forest area. Other measures such as electrified fences, trenches in the forest boundaries, chemical immobilisation and capture are also being applied to control the situation. But co-operation between the local people or the stakeholders and the forest department is required with more realistic management practices to overcome the situation.