



Human-Elephant Conflict Mitigation Measures: Lessons from Bangladesh



INTERNATIONAL UNION FOR CONSERVATION OF NATURE



Human-Elephant Conflict

Mitigation Measures: Lessons from Bangladesh



Asian Elephant (*Elephas maximus*)
© IUCN / Sultan Ahmed

Human-Elephant Conflict Mitigation Measures: Lessons from Bangladesh

Authors

Md. Ahsanul Wahed
Mohammad Rahmat Ullah
Haseeb Md. Irfanullah

Institutional Advisor

Ishtiaq Uddin Ahmad

IUCN, International Union for Conservation of Nature
Dhaka, Bangladesh
2016

The designation of geographical entities in this book and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of IUCN, International Union for Conservation of Nature concerning the legal status of any country, territory, administration, or concerning the delimitation of its frontiers or boundaries. The information, database and views expressed in this book are not necessarily reflecting those of IUCN, Bangladesh Forest Department and The World Bank.

The publication has been made possible because of the funding received from The World Bank through Bangladesh Forest Department to implement the subproject entitled 'Pilot Programs to Identify Effective Measures to Reduce the HEC' under the 'Strengthening Regional Cooperation for Wildlife Protection' project.



Published by: IUCN Bangladesh Country Office, Dhaka



Copyright: © 2016 IUCN, International Union for Conservation of Nature and Natural Resources

Reproduction of this publication for educational or other non-commercial purposes is authorized without prior written permission of the copyright holders, provided that the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holders.

Citation: Wahed, M.A., Ullah, M.R. and Irfanullah, H. Md. 2016. *Human-Elephant Conflict Mitigation Measures: Lessons from Bangladesh*. IUCN, International Union for Conservation of Nature, Bangladesh Country Office, Dhaka, Bangladesh. 30 pp.

Design by: Sheikh Asaduzzaman

ISBN: 978-984-34-1219-5

Cover Photo: Left to Right- Non-preferred crop cultivation © IUCN/Iqram Uddin Al Amran; Bio-fencing © IUCN/Rupon Barua; Bamboo seedling raising at nursery for plantation at core zone of elephant © IUCN/S.M. Rassel; Solar electric fencing © IUCN/Rupon Barua; Trip alarm installation © IUCN/Md. Fazlay Arafat; Watchtower © IUCN/Md. Fazlay Arafat.

Available from: IUCN, International Union for Conservation of Nature
Bangladesh Country Office
House 16, Road 2/3, Banani
Dhaka 1213, Bangladesh
www.iucn.org/bangladesh

Preface

The Asian elephant plays a crucial role in its forest ecosystem. Commonly referred to as a 'keystone' species, it helps to open up forest clearings and distributes the seeds of trees and shrubs. The magnificent animal becomes threatened due to poaching, destruction of forest and conflict with human. In recent years, the magnitude of human-elephant conflict (HEC) has increased due to anthropogenic causes by increased population in many areas of Bangladesh. Due to fragmentation of habitats, elephant ranges in Bangladesh have become confined to small patches occupied by a single or few small herds. Some corridors have been abandoned due to degradation of forest cover, extension of human settlements, development of infrastructure, intensification of agricultural practice, unsustainable slash and burn practice, and unplanned road construction, for example.

The initiative entitled 'Pilot Programs to Identify Effective Measures to Reduce the HEC', a sub-project of 'Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project' has been designed to address and reduce human-elephant conflict with support from Bangladesh Forest Department and The World Bank. The project carried out research on the nature of human-elephant conflict to come up with appropriate solutions. The initiative further piloted a number of mitigation measures, such as non-preferred crop cultivation, trip alarm, solar electric fencing, chilli rope, establishment of watch tower, elephant response team and bio-fencing, to identify their effectiveness for reducing human-elephant conflict. Side by side, for habitat improvement, plantation of fodder and shade tree and establishment of salt lick have been carried out.

The production and publication of this book is intended to capture the successes and lessons learnt from the 'Pilot Programs to Identify Effective Measures to Reduce the HEC' project and to document the impacts of piloted initiatives and key lessons generated. We believe this document will be useful to policy makers, project implementers, academicians and researchers interested in the field of elephant conservation as well as wildlife conservation in general.

Ishtiaq Uddin Ahmad
Country Representative
IUCN Bangladesh Country Office

Message

Elephants have ingrained in our culture. The importance of conserving the Asian Elephant in Bangladesh is now established. Most Asian elephant populations are mostly fragmented and pocketed, and therefore more vulnerable to extinction. Being one of the Asian Elephant range countries, Bangladesh holds the responsibility to lend a hand to the global effort for conserving this majestic animal.

The population of Bangladesh has increased in course of time which contributed to land use change and increased dependency of people over natural resources. Human interference within the forest increased conflict with wildlife in different parts of Bangladesh. The conflict between human and resident elephant is confined in Chittagong, Chittagong Hill Tracts and Cox's Bazar. Conflict with the migratory elephants is a serious concern in the central-north districts, namely Sherpur, Mymensingh and Jamalpur. Now-a-days, death and injury of both humans and elephants become common phenomenon in elephant ranges of Bangladesh.

Conflict between humans and elephants have become an important issue for conservationists over the last two decades. To reduce human-elephant conflict, Bangladesh Forest Department in association with IUCN Bangladesh initiated the project entitled "Pilot Programs to Identify Effective Measures to Reduce the HEC" under "Strengthening Regional Cooperation for Wildlife Protection" project with support from The World Bank.

The initiative has piloted innovative technologies in elephant ranges of Chittagong and Chittagong Hill Tracts that contributed to minimise human-elephant conflict. I believe that the replication of these technologies in conflict prone-areas of Bangladesh will assist conflict management at scale.

Md. Yunus Ali

Chief Conservator of Forests
Bangladesh Forest Department
Ministry of Environment and Forests

Acknowledgements

It gives us great pleasure to acknowledge Bangladesh Forest Department and The World Bank, for their support towards implementation of the sub-project entitled 'Pilot Programs to Identify Effective Measures to Reduce the HEC' under the 'Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project' and capture its lessons through this publication.

We would like to express our sincere gratitude to Md. Yunus Ali, Chief Conservator of Forests, Bangladesh Forest Department and Ishtiaq Uddin Ahmad, Country Representative, IUCN Bangladesh for their immense support and direction for implementation of this project.

Special thanks to Dr. Aparup Chowdhury and Akbar Hossain, the former Project Directors of SRCWP Project and Md. Abdul Mabud, Project Director, SRCWP Project, for their rigorous support during the implementation of the sub-project. Thanks are also due to the Ashit Ranjan Paul, Conservator of Forests, Wildlife and Nature Conservation Circle and his predecessor Dr. Tapan Kumar Dey for their continuous support and direction.

We appreciate the effort of relevant Conservator of Forests, Divisional Forest Officers and Assistant Conservator of Forests who have led consultation workshops at the local level and helped in plantation programme. Our thanks especially go to Abdul Latif Mia, Mohammad Abdul Awal Sarker, Md. Ali Kabir, S.M. Golam Mowla, Bipul Krishna Das, Hoq Mahbub Morshed, Abu Naser Mohsin Hossain, and Kajal Talukder.

Thanks are also due to relevant Range Officers and Beat Officers of Bangladesh Forest Department who supported the project team during project implementation.

Special thanks are due to IUCN Bangladesh project team who supported implementation of the project and the authors in the creation of this document: Nasim Aziz, Md. Ahsanul Wahed, Md. Fazlay Arafat, Babla Mohajon, Rupon Barua, Iqram Uddin Al Amran, Bokhtiar Uddin, Md. Akhter Hossain, Dr. Haseeb Md. Irfanullah, Mohammad Rahmat Ullah, Mohammed Abdul Motaleb, Md. Ashraful Haque, Mohammad Sultan Ahmed and Zubair Hussni Fahad. Thanks are also due to Sheikh Asaduzzaman of IUCN Bangladesh for designing this book and Ishrat Binte Mahmud for language editing.

Md. Rezaul Karim Chowdhury

Principal Investigator

Pilot Programs to Identify Effective Measures to Reduce the HEC

IUCN Bangladesh Country Office



Table of Contents

Prologue	10
Elephants in Bangladesh	11
Nature of Human-Elephant Conflict	13
Human-Elephant Conflict Management in Bangladesh	15
Human-Elephant Conflict Mitigation Techniques	17
Non-preferred Crop Cultivation	19
Bio-fencing	20
Solar Electric Fencing	21
Trip Alarm	22
Chilli Rope	23
Watchtower	24
Salt Lick	25
Plantation in Elephant Habitat	26
Elephant Response Team	27
Way Forward	28



A photograph of an Asian elephant standing in a lush, green forest. The elephant is facing right, with its head slightly turned towards the camera. It has a thick, wrinkled grey trunk and small, curved tusks. The background is filled with dense foliage and trees.

Prologue



Elephants in Bangladesh

Elephants have both ecological and cultural importance. They are known as ecosystem's engineer and gardener. They play a vital role in forest enhancement by disbursing seeds and creating environment for germination. Dung of elephant plays a crucial role in nutrient cycling by providing nutrients to the soil that is ultimately used by the flora. It is also a good source of food for many insect species. It is well understood that elephant is playing a key role, particularly in maintaining diversity of flora and fauna, and regenerating the forest environments.

Asian elephants are categorized as Critically Endangered species¹ in Bangladesh due to reduction of population. The demand of land by the increasing human population is changing the land use system leading to encroachment and fragmentation of forests and subsequent food scarcity for elephants and human-elephant conflict. Results of studies indicate about 100 years ago, elephants were apparently found in most of the forests of Bangladesh². Even in the middle of last century, existence of 500 elephants throughout the forest of Bangladesh was reported by the scientists³. With start of this century, a study found the number of Asian elephant in Bangladesh reduced to 228-327⁴ due to above mentioned reasons.

¹ IUCN Bangladesh. 2015. *Red List of Bangladesh Volume 2: Mammals*. IUCN, International Union for Conservation of Nature, Bangladesh Country Office, Dhaka, Bangladesh, pp. xvi+232.

² Alam, M.K. 2008. Forests and Forestry in Bangladesh. In: Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A.K.A. and Haque, E.U. (eds). *Encyclopedia of Flora and Fauna of Bangladesh, Vol. 1. Bangladesh Profile*. Asiatic Society of Bangladesh, Dhaka.

³ Choudhury, A. 2007. Impact of border fence along India-Bangladesh border on elephant movement. *Gajah* 26: 27-30.

⁴ IUCN Bangladesh. 2004. *Conservation of Asian Elephants in Bangladesh*. IUCN, Bangladesh Country Office, Dhaka, Bangladesh.



Nature of Human-Elephant Conflict

The conflict between human and resident elephant is common in Chittagong, Chittagong Hill Tracts and Cox's Bazar regions of Bangladesh. On the other hand, the conflict with the migratory elephants is a serious concern in the central-north districts, namely Sherpur, Mymensingh and Jamalpur. Now-a-days, death and injury of both humans and elephants become common phenomenon in elephant range areas of Bangladesh due to increased human interference in the forests for resources⁵ and elephant's raid within the locality for searching for food. Examples of casualty will provide better understanding on the nature of human-elephant conflicts. In March 2016, a resident of Chambol beat in Bashkhali upazila (sub-district) of Chittagong district went to forest for collecting fuel wood and was killed by wild elephant in the noon. During April-June 2015, seven people were killed by elephant in Chunati Wildlife Sanctuary, Chittagong and most of the killings took place within the reserve forest by a single elephant. In December 2014, three people were killed and another one was injured as raiding elephants invaded several villages at Satkania upazila of Chittagong district⁶. A few months later in April 2015, dead bodies of two young elephants were discovered in this upazila without any external damage and the reason behind death is still unknown, while local people guessed poisoning might be the reason of death. The damage of crops is high in many elephant range areas of Bangladesh than other incidences. It was estimated that 760 conflicts were related to crop damage out of 920 conflicts occurred during January 2014–May 2016 within the project areas, namely Rangunia, Khurusha, Jaldhi, Chunati and Bandarban Sadar Ranges.

⁵ Sarker, A.H.M.R. and Roskaft, E. 2011. Human-wildlife conflicts and management options in Bangladesh, with special reference to Asian elephants (*Elephas maximus*). *International Journal of Biodiversity Science, Ecosystem Services and Management*, 6(3-4): 164-175.

⁶ Sarker, A.H.M.R., Hossen, A. and Roskaft, E. 2015. Fatal elephant encounters on humans in Bangladesh: Context and incidences. *Environment and Natural Resources Research*, 5(2): 99-108.



Human-Elephant Conflict Management in Bangladesh

Human-elephant conflict minimisation has become a major challenge for the Government of Bangladesh. The Government has taken different initiatives to minimise the conflict. In 2001, Bangladesh Forest Department formed Wildlife and Nature Conservation Circle for safeguarding biodiversity and wildlife. Formation of Co-Management Committees (CMCs) in protected areas involving forest-dependent people for conserving forest and wildlife has been practiced by Bangladesh Forest Department. However, elephant habitats are not confined only within the protected areas. At the end of 2001, IUCN Bangladesh and Bangladesh Forest Department commissioned a project with support from U.S. Fish and Wildlife Service for elephant census and threat identification and prioritisation. In the following decade, these three organisations continued their efforts in conserving Asian elephants in Bangladesh where human-elephant conflict minimisation remained an important aspect.



In 2013, Bangladesh Forest Department took three sub-projects under The World Bank-supported 'Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project' to count elephant, identify elephant routes and corridors, and to minimise human-elephant conflicts in Sherpur, Chittagong and Bandarban areas. Bangladesh Forest Department, in association with IUCN Bangladesh and HEDS, has taken pragmatic initiatives to reduce human-elephant conflict. The Department, in collaboration with IUCN Bangladesh, has formalised Elephant Response Teams for minimising conflicts in the central-north and south-eastern conflict-prone areas.

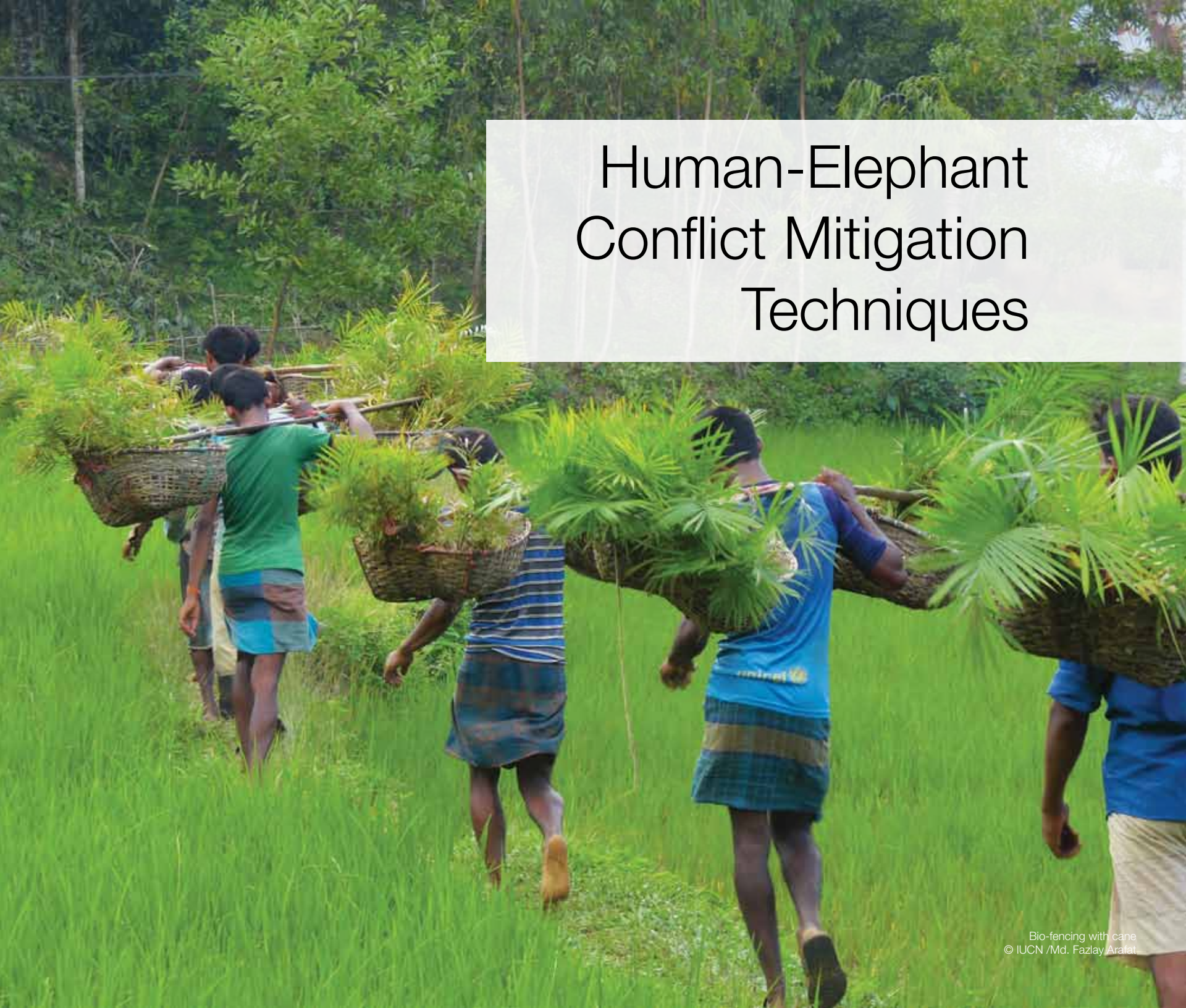
In addition to the formation of Elephant Response Teams, IUCN Bangladesh has introduced a range of conflict management techniques at the grassroots level under the 'Pilot Programs to Identify Effective Measures to Reduce the HEC' sub-project of the SRCWP Project. These human-elephant conflict mitigation technologies include, cultivation of non-preferred crops by farmers, bio-fencing, solar electric

fencing, chilli rope, watchtower, and setting up early warning systems, which have been piloted in different conflict-prone areas of the south-eastern part of Bangladesh. In addition, for enriching habitats for wild elephants, the sub-project has planted suitable species in around 260 hectares of land in Sherpur, Chittagong and Cox's Bazaar districts. Salt lick has been established to meet demand of minerals by the wild elephant. Awareness raising initiatives have been taken to change mind set and knowledge of people for minimising conflicts. For trans-boundary elephant management, the first dialogue took place between the Forest Departments of Bangladesh and India with an aim to secure elephant habitats and the free movement of this mega-fauna. Capacities building of Elephant Response Teams on techniques to stray elephants from the locality and cultivation of non-preferred crop have also been done.

Before piloting the human-elephant conflict mitigation technologies in the field, secondary literature was reviewed to select appropriate options. The short-listed options were then consulted with the local stakeholders, like affected communities, local government representatives and officials of Bangladesh Forest Department for piloting. Selection of people and sites for piloting of options was done through consultation with these stakeholders. This gave them an opportunity to accept these technologies and to get involved in the piloting. Monitoring has been done by the stakeholders and project team regularly to find out the impacts created in the field. Along with the piloting, people have been engaged in awareness programmes and data collection for knowing the nature of human-elephant conflict.

This book briefly documents nine mitigation technologies and captures the lessons learnt from piloting them under the 'Pilot Programs to Identify Effective Measures to Reduce the HEC' sub-project in the south-eastern elephant range in Bangladesh. It is expected that the knowledge generated from this pilot intervention will help wildlife biologists, wildlife managers, policy-makers, and other stakeholders in minimising human-elephant conflicts in Bangladesh and elsewhere with similar social, environmental and wildlife management contexts.

Human-Elephant Conflict Mitigation Techniques



The techniques piloted to mitigate human-elephant conflicts can be divided into three broad categories. The first group includes innovations like i) non-preferred crop cultivation, ii) bio-fencing, iii) solar electric fencing, iv) trip alarm, v) chilli rope, and vi) watchtowers. The second group is about improving elephant habitat through establishing i) salt lick and ii) plantation for elephants. The final category includes organising community people living in elephant ranges into smaller groups – Elephant Response Teams – and building their capacity to mitigate human-elephant conflict not only for pushing away elephants invade their localities, but also helping their communities with above mitigation technologies and by raising their awareness. Piloting of these mitigation measures in the field has created a scope to identify the effectiveness of these techniques in conflict mitigation for scaling up.

Non-preferred crop (Chilli) cultivation
© IUCN /Iqram Uddin Al Amran



Watchtower
© IUCN /Iqram Uddin Al Amran



Machineries of solar electric fencing
© IUCN /Rupom Barua



Chilli rope demonstration
© IUCN /Md. Fazlay Arafat



Plantation at Chunati site
© IUCN /Babla Mohajon



Elephant sign within salt lick
© IUCN /Md. Fazlay Arafat





Okra cultivation
© IUCN /Md. Fazlay Arifat



Taro cultivation
© IUCN /Md. Fazlay Arifat



Chilli cultivation
© IUCN /Iqram Uddin Al Amran

Non-preferred Crop Cultivation

Under natural conditions, elephants mostly prefer plants, like paddy, grass, bamboo, jackfruit, mango, and banana. Some unpalatable crops, for example chilli, citrus, bitter gourd, okra, taro and teasel gourd are considered as non-preferred crops for elephants as they do not like these crops because of their tastes. Literature review and consultations with local farmers helped to identify non-preferred crops suitable for the project sites. Through local level consultation, project team also identified suitable sites to grow these non-preferred crops to pilot if these can reduce crop loss and elephant disturbance in the locality. Before piloting, affected farmers were selected and subsidised with cultivation materials.

Piloting has shown that only 3% area of 36 non-preferred crop plots got damaged by elephants trampling. The figure is much less than the damage faced by adjacent preferred crop plots where 22% area of 102 crop plots got damaged by elephants. The positive impact of non-preferred crop cultivation needs to be extensively channeled through Department of Agricultural Extension so that farmers of the human-elephant conflict zones of Bangladesh can adopt the technology and reduce crop and economic losses.



Teasel gourd cultivation
© IUCN /Iqram Uddin Al Amran



Establishment of bio-fencing
© IUCN /Rupn Barua



Plantation of cane seedlings
© IUCN /Rupn Barua

Bio-fencing

Bio-fences are lines of trees or shrubs planted on the boundaries of farms or human settlements that provide protection against wildlife. For elephants, bio-fencing technique involves grow cane/rattan (with sharp spines on the stem) on human settlement boundaries to deter elephants from entering human habitations and crop fields. This technique is environment-friendly, cost-effective and more useful than fences made of wood, barbed wire, or stone masonry; and effectively prevents elephants from intruding into villages. Project team in consultation with Bangladesh Forest Department and local people selected sites and established bio-fences in Kodukhola of Bandarban, Harbang of Chakaria, Cox's Bazar, and Chambol of Bashkhali, Chittagong. Moreover, to reduce human-elephant conflicts and to stop elephant coming from forest to locality, responsibility has been given to Bangladesh Forest Department, local communities and Elephant Response Teams for monitoring of the bio-fences. To protect these bio-fences, such regular monitoring is essential and crucial. Sustainable harvesting of bio-fence could be introduced involving community since cane has many uses. Such closely monitored harvesting system can improve community ownership and enhance community's interest in protecting the bio-fences.



Solar Electric Fencing

A solar electric fence is a barrier that uses electric shocks (solar panels to absorb and convert sunlight into electricity) to deter animals or people from crossing a boundary. Seven kilometers of solar electric fencing has been established in Borohatia and Sufinagar of Lohagora upazila, Chittagong and Vaggokul village of Sadar Upazila, Bandarban to protect human settlement from elephant attack. Human settlements of those areas were surrounded by solar electric fences with a voltage of 10 Kilo Volt and 0.0025 ampere.

This technology is simple and definitely deters elephants – if it is continuously kept under good management. The project team engaged villagers and officials of Bangladesh Forest Department in all aspects of decision making and establishment, such as site selection, the electric fence assembly, construction of concrete posts, clearing the fence line, digging holes for fence post, erecting fence posts and lines, and operating the system. Major equipment and the system have been tested by Bureau of Research, Testing and Consultation of Bangladesh University of Engineering and Technology. Villagers have been trained to maintain, repair and operate the electric fence. Three committees have been formed by Bangladesh Forest Department engaging Elephant Response Teams, representatives of Co-Management Committees, local elites along with the officials of the Department in three sites for monitoring and maintenance of the solar electric fences. A modality of role was also developed for the committee in consultation with local people and Bangladesh Forest Department to ensure effective management of solar electric fences, which will help in managing future human-elephant conflicts.

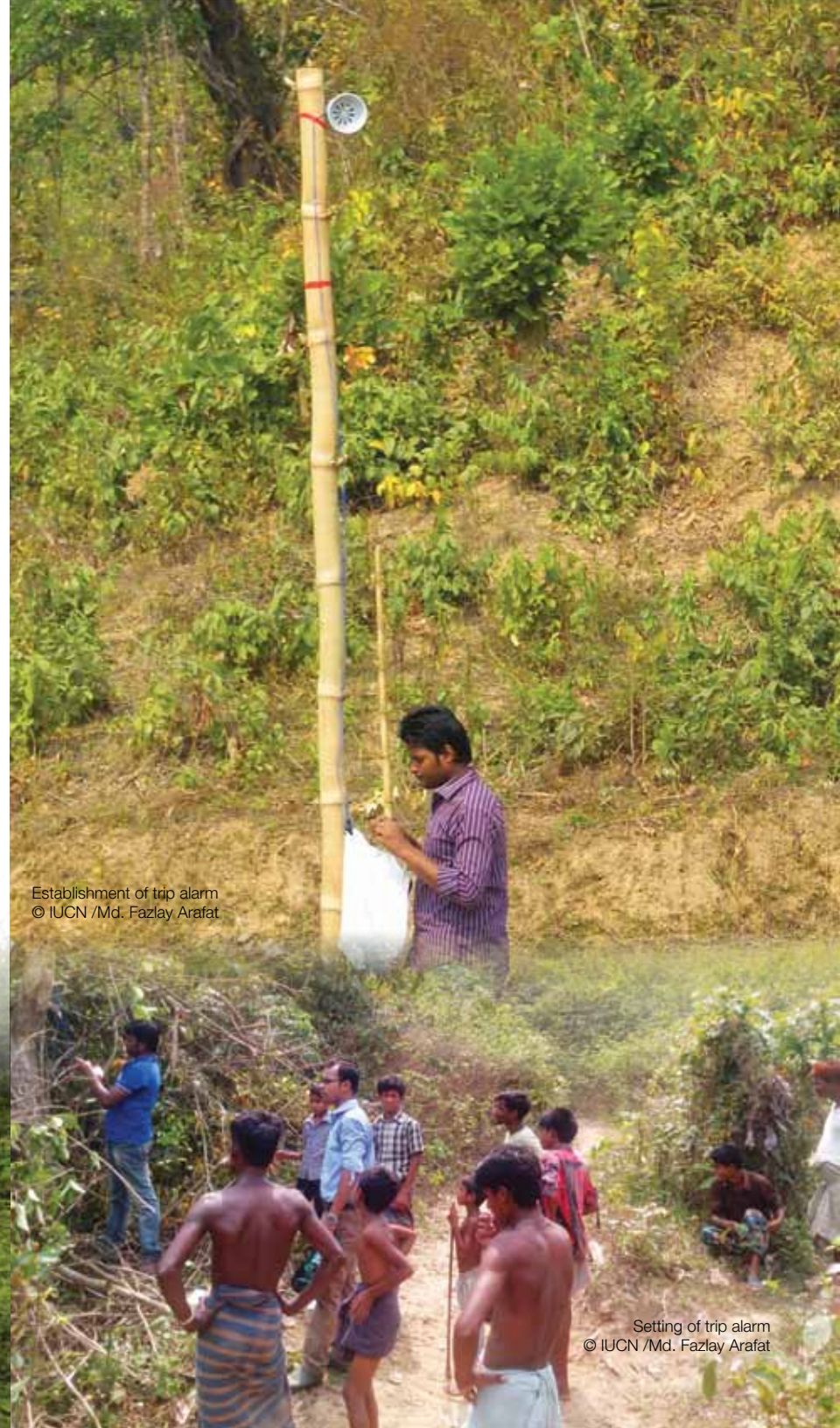
The technique found to be effective to produce sufficient electric shock to deter elephants from entering human settlement. It has been observed that after establishing the solar electric fences in June 2016, elephants did not enter the human settlements, which never happened in the past.

Trip Alarm

Trip alarm is a warning system to prevent elephants from damaging the crop fields or human settlements. A thin wire is installed around a field or a settlement at the usual entrance of elephants; whenever the wired circuit is broken, it makes a loud sound. The noise alerts people and irritates elephants tending them to go back without entering the human territory. The installation of this cost-effective early warning system is easy, requiring regular maintenance without frequent replacements.

The project team piloted 20 trip alarms in the project sites which were found very effective in repelling elephants. The team engaged the local communities for selecting sites in consultation with the officials of Bangladesh Forest Department. While setting up trip alarms, these communities were involved in practical training on how to install and maintain this system. During the period of February 2015 to March 2016, 13 raids were prevented by trip alarms at different sites which saved crops and lives of people. This economical method can be utilized in a simple way around a large area. Replication of this initiative in other areas of Bangladesh can help in reducing human-elephant conflicts.

Trip alarm set-up by community
© IUCN /Md. Fazlay Arafat



Establishment of trip alarm
© IUCN /Md. Fazlay Arafat

Setting of trip alarm
© IUCN /Md. Fazlay Arafat

Chilli Rope

Chilli rope is a technique where chilli powder is mixed with grease and dry tobacco leaf, and then applied on ropes along the perimeter of a crop field for repelling elephants. This technique uses locally available and affordable materials and a recommended variety of locally grown hottest chilli as elephants do not like the smell of chilli.

This technique was so much interesting for the communities that they participated in the installation and maintenance without charging for their labour. Both the project team and the community purchased sun-dried chillies from the local market to prepare the sticky paste by mixing the chilli powder with tobacco leaf and grease. The paste was then smeared on ropes and put up around selected plots. The project provided materials to pilot a total length of 10 kilometer chilli rope fence in the project sites. The low-cost, relative to other barriers, has made chilli rope technique an attractive option to be used in the dry season as rain washes out the effectiveness of the chilli-tobacco-grease rope fence.

Chilli rope
© IUCN /Babla Mohajon



Materials for chilli rope
© IUCN /Md. Fazlay Arafat



Preparation of chilli paste
© IUCN /Md. Fazlay Arafat



Setting of chilli rope
© IUCN /Babla Mohajon

Watchtower

Watchtower is a place from where people can do surveillance. Monitoring elephant activities give an opportunity to take proper action for minimising loss. Watchtowers for elephant were built with wood, bamboo and plastic cover/tin-sheet in tall trees (usually 6-9 meters high) with an easy to climb ladder near the forest boundary and used by guards at night to detect elephants from a distance. These low cost and simple to construct watchtowers provide guards the ability to see across the entire farm with a powerful torch; can be an effective warning system.

A total of 13 watchtowers have been made in different conflict-prone areas. Site selection and construction of watchtower have been done through consultation with respective communities and Bangladesh Forest Department officials of the forest range. The community-based crop protection scouts have been formed by community themselves who use the watchtowers. They have been rotationally guarding for the protection of crops and property from elephant in all seasons. This option improves the performance of other farm-based deterrent techniques and reduces crop damage on vulnerable farms.



Salt Lick

Salt licks are artificial deposit of mineral salts used by elephants to supplement their nutrition, ensuring enough minerals in their diets. A wide range of animals, primarily herbivores use salt licks to get essential nutrients, like calcium, magnesium, sodium and zinc. Elephant digs up the licks content using their tusks and take materials with the trunk. Site for salt lick preparation was selected after consultation with officials of Bangladesh Forest Department and the communities. All bushes were cleared keeping only mature trees. Different proportionate of normal and rock salts were mixed and spread on the area with watering.



From field data, it was observed that elephants frequently visited the salt lick area (0.02 hectare area – an experimental plot in south-eastern Bangladesh). Salt lick reduces the demand of minerals by elephants and in turn reduces damage of household properties for search of minerals. These also become a sort of rally points where lots of elephants can be observed and monitored.

Plantation in Elephant Habitat

Not getting enough food in the forests, elephants often come to human territory in search of food. Enrichment of denuded hills with fodder and shade tree species for ensuring a favourable environment for elephant is termed as habitat improvement. A total 160 hectares of land have been improved with Bangladesh Forest Department in Cox's Bazar and Chittagong. While creating new plantations, the Department has given priority to elephant-preferred species, like bamboo, banana, jackfruit, mango and chapalish. The maintenance responsibility of these plantations has also been given to the Department as they are the custodian of those forest lands. Establishment of such forest patches help elephants to survive by providing them with foods and shelter.



Banana Plantation at Dhobachal
© IUCN /Md. Fazlay Arafat



Nursery at Napura beat
© IUCN /Iqram Uddin Al Amran



Plantation at Napura beat
© IUCN /Iqram Uddin Al Amran



Plantation site at Chunati
© IUCN /Babla Mohajon

Elephant Response Team

An Elephant Response Team (ERT) is a group of people (usually 10 persons in a group) working to mitigate human-elephant conflicts with an active role in conflict incidents and raising human-elephant co-existence related awareness activities at local level. The project team trained seven Elephant Response Teams and equipped them with hand mikes, search lights, torchlights, bee sound machines and whistles. These teams were formed upon consultation with local communities, officials of Bangladesh Forest Department and local government representatives.

Each team is comprised of a team leader and general members. Elephant Response Team members were trained in the methods on how to stop elephant raid without causing any injury to the elephants to fulfill their roles; for example, the method to chase elephants from villages or crop fields. Trained members of Elephant Response Team were also motivated to regulate human-elephant conflict to lessen the property losses and death rate. Elephant Response Team together with Bangladesh Forest Department have been working to support conservation of the natural habitats of elephant and to control anthropogenic activities in the forest areas.

After formation of Elephant Response Teams in July 2015, 133 raids were stopped in different project areas of Chittagong and Chittagong Hill Tracts till September 2016. Regular follow-up and coordination by the Bangladesh Forest Department is indispensable to enhance capacity of this team and to ensure their effectiveness.



Way Forward



The piloted mitigation measures have shown improvement in human-elephant conflict mitigation in the selected elephant ranges of south-eastern Bangladesh. Combination of mitigation measures may help in conflict minimisation in the future. Based on acquired knowledge from the field, the following areas need substantial focus for further improvement in conflict mitigation.

Recognising and strengthening Elephant Response Teams

The involvement of the Elephant Response Team in conflict minimisation showed better results. So these novice Elephant Response Teams need further nursing and support for the continuation of their effective performance. Coordination with regular monitoring by Bangladesh Forest Department is still required for the functioning of these teams. Initiatives to engage the members of these teams in social safety net and social forestry programmes need to be taken as they are volunteering in conflict management. Recognition of their effort by the Government will encourage them to work for the community. More teams need to be formed with proper training in other human-elephant conflict-prone areas.

Monitoring, maintenance and replication of installed measures

Installed technologies like, solar electric fencing, trip alarm and watchtower are found to be effective tools for conflict minimisation. For the maintenance of these measures, formation of a community-managed fund is needed to bear the cost of repair, especially after the warranty period of electronic devices. Assistance from government or non-government organizations is required in the formation of the community-managed fund. Regular monitoring from Bangladesh Forest Department is required for the better management of these technologies. Replication of these technologies in other human-elephant conflict-prone areas, like in central-north of Bangladesh, can help in reducing similar conflicts at larger scale.



Scaling up of nature-based solutions

Maintenance and replication of nature-based initiatives, like plantation, salt lick and bio-fencing are needed to be carried out by Bangladesh Forest Department in collaboration with local communities and other appropriate stakeholders. In designing future plantation programmes, the prerequisite is to consider those tree species that are favourable for elephant as well as for other wildlife. Capacity building of farmers on cultivation of non-preferred crops and protection of crop fields using chilli rope will lead to reduce the number of conflict in conflict-prone areas. For non-preferred crop cultivation, selection of appropriate crops and marketing of the produces at competitive price are crucial to reduce economic losses and to keep farmers' interest alive. The Government needs to focus on replication of nature-based solutions involving appropriate stakeholders of other human-elephant conflict-prone areas.

Public awareness and capacity building

To improve the understanding of the stakeholders who are establishing infrastructures in or around the forest areas and the people dependent on forest resources, it is very crucial to engage them in awareness raising programmes on wildlife conservation and its importance in maintaining ecosystems. In the human-wildlife conflict-prone areas, the conflict mitigation opportunities is also a vital agenda of such awareness campaigns, which may need to be followed by capacity building initiatives.



Non-preferred crop cultivation
© IUCN / Iqram Uddin Al Amran



Meeting with Co-management Committee
© IUCN / Md. Fazlay Arifat



Knowledge sharing with community
© IUCN / S M Rasel



Given the dynamic nature of human-wildlife conflict, continued research and investigations can build our understanding of the changing nature of these conflicts and can help us to identify measures to minimise the negative impacts of conflict on both human and wildlife. As this book has shown, technological innovation can be a crucial part of minimizing human-elephant conflicts. It is very important first to test an innovation at a small scale, to evaluate its impacts and challenges, and, based on these results, to spread it for wider benefits through scaling up. While promoting innovations, we need to remember the fact that innovation is essentially a continuous process. We need to modify or improve a system, a tool or a technology to respond to new challenges in new times and reinvent accordingly.



International Union for Conservation of Nature
Bangladesh Country Office
House 16, Road 2/3, Banani
Dhaka 1213, Bangladesh
Tel: +8802 55040938, 55040939, 55040940
Fax: +8802 55040932

www.iucn.org/bangladesh