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Government of India
Ministry of Environment, Forests and Climate Change
Project Elephant Division

Indira Paryavaran Bhawan,
Aliganj, Jor Bagh Road, New Delhi-110003
Phone No. 24695292/84 (F)

Dated 6th October, 2017

To,

1. Principal Chief Conservator of Forests (HoFF) of all States and UTs.
2. Chief Wildlife Warden of all States and UTs.
3. Director, Wildlife Intitute of India, Dehradun.
4. All Members of the Steering Committee (Non-official)

Sub: Guidelines for Management of Human Elephant Conflcits.

Sir,

As per decision taken in the 13th Meeting of the Steering Committee held on 17th December, 2014, Working Group to Study the "Feasibility and Implementation of Recommendation of Task Force Report, Gajah" was constituted. As mandate of the Working Group also include mitigation of Human Elephant Conflict, the Working Group proposed comprehensive "Guidelines for Management of Human-Elephant Conflict". The "Guidelines for Management of Human Elephant Conflicts" duly approved by the competenet authority is enclosed for your information and needful action.

Encls: As above.

Yours faithfully,

6.10.2017.

(R.K. Srivastava)
Inspector General of Forests
(Project Elephant)
Email: igpe-mef@nic.in

Copy forwarded for information and necessary action to:

1. PS to Hon'ble Minister, EF&CC
2. PS to Hon'ble Minister of State, EF&CC.
3. PPS to Secretary, Ministry of Environment Forests & Climate Change.
4. PPS to DGF&SS, Ministry of Environment Forests & Climate Change.
5. PPS to Addl. DGF (WL)/PPS to ADGF (NTCA)/PPS to IGF (WL)/ PA to ID (WL/PE), EF&CC
6. The Chief Secretaries and Forest Secretaries of all the State Governments/UTs.

Guidelines for Management of Human Elephant Conflicts

INTRODUCTION

1. Definitions

Human elephant conflict: The Elephant Task Force (ETF) defines human-elephant conflict (HEC) as the adverse impact people and elephants have on each other

Hard boundary: The Elephant Task Force (ETF) defines hard boundary as distinct boundaries between human use areas and elephant habitat areas

Diffused boundary: The ETF defines diffused boundary as where the boundary between human use and elephant habitat areas is not clear, especially under conditions of complex land use mosaics

Deterrent measure: These are measures used to prevent entry of elephant in human use areas such as villages, agricultural fields and urban areas etc.

Repellent measure: These are techniques used to drive away elephants when they have already entered human use area

Obligate crop raiding: The ETF defines obligate crop raiding as situation where elephants are forced to raid crops due to insufficient forage resources in their natural habitat.

Opportunistic crop raiding: The ETF defines opportunistic crop raiding as situation where elephants raid crops due to their availability and attractiveness rather than shortage of natural forage resources in forests.

Kunki: Captive trained elephants used for elephant drive and capture operations

Seasonal migration of elephants: Elephants are migratory species and generally follow the same migratory routes annually depending on ecological conditions. Asian elephants in deciduous forests of southern India, with numerous water sources, reported elephant migration to extend between 20 and 50 km.

2. Background

Human elephant conflict (HEC) has emerged as one of the most challenging problems for elephant management and conservation in recent times. It creates considerable economic hardships for the affected farmers. There are several regions that experience crop damage by elephant year after year. Human deaths due to encounters with elephants are also an issue of serious concern. It is estimated that every year approximately 400 persons are killed by elephants across the country and more than 100 elephants are also killed annually, mostly as retaliatory killings by people.

HEC has proved to be quite intractable and managing HEC is a big problem for fores officers and frontline staff, who have to deal with it, often on a regular basis. Often they have to face the ire of the affected farmers, especially when there is a human death or severe injury. There are innumerable incidents when frontline staffs have faced the ire of affected people due to HEC, sometimes at risk to their personal safety.

Considering these factors management of HEC is one of the most important issues that need to be addressed in planned way for conservation of elephants.

The main types of HEC are:

i. Human injury or deaths in encounters with elephants
ii. Damage to standing agricultural and plantation crops
iii. Damage to harvested and stored agricultural crops, often accompanied by damage to the storage facility
iv. Damage to property such as sheds, houses, pipelines and irrigation facilities.
v. Death/ injury to cattle and other domestic animals.
vi. Injury and death of elephants mostly due to retaliatory attacks by humans due to electrocution by power lines or poisoning
vii. Death of elephants due to train collisions
viii. The development activities and houses in movement path of elephants (especially labour lines in tea gardens) are also causes of encounter between human and elephants leading to HEC

The single most important reason, elephants enter human use areas are to feed on agricultural and plantation crops. The second reason is for water, with damage to property and human life arising as incidental damage, from trampling or some feeding on crops by the elephants.

The ETF defines describes obligate and opportunistic crop raiding. In many circumstances it is difficult to identify the type of crop raiding. Therefore in these guidelines the approach is taken of symptomatic treatment of HEC rather than trying to identify the cause of crop raiding. The issue of habitat improvement to meet the elephants forage and spatial needs within forest areas has been addressed in detail in the ETF report.

Retaliatory or accidental killing of elephants is the other face of HEC. The affected community or individuals sometimes retaliate against elephants, either in revenge, or to prevent further attacks by elephants. Practices adopted for retaliatory killings include shooting the elephant or electrocution (sometimes by accident as these are often meant to deter other wildlife such as wild pig). Therefore elephants are also the victims of HEC.

Complete solutions to HEC probably do not exist. However, good HEC management and mitigation practices can go a long way to minimize the adverse impacts of HEC on societies.

3. Factors Influencing Intensity of HEC

HEC intensity is highly variable, ranging from very occasional to chronic. Density of elephant populations obviously plays an important role in HEC intensity. The nature of the interface between human areas and elephant habitat also determines conflict intensity, where an irregular and diffuse boundary with a long perimeter is thought to increase intensity of conflict. Highly fragmented elephant habitat interspersed with human use areas is also likely to increase conflict frequency and intensity. In some cases dispersing herds wander into extensive agricultural habitats with hardly any forest and cause high intensity of conflict, at least in the initial years. In some regions the agricultural damage is lower and the conflict is mainly due to loss of human life. Train-elephant collisions occur frequently in Bengal, Assam, Odisha, Kerala and Tamilnadu, where railway tracks pass through forests with sizeable elephant populations. The HEC management strategy also needs to be adjusted to suit the particular situation and both short and long term measures should be adopted based on the field situation to mitigate HEC.

4. Organization of these guidelines

These guidelines are written in three parts - an introduction, an overview of current HEC management practices, and prescribed guidelines to minimize and mitigate conflict.

OVERVIEW OF CURRENT HEC MANAGEMENT PRACTICES

5. Installation of Barriers

Barriers are used for preventing elephant exit outside reserve forest areas or entry into cultivated fields or human inhabited areas. Barriers may be used to guide elephants through funneling to over-bridges or under-passes set up for them to negotiate railway lines, highways or canals safely. The principal types of barriers used against elephants:

- Elephant proof trenches (EPT)
- Solar-powered high voltage electric fences
- Rubble walls
- Other types of fences made from railway tracks, steel channels and bars etc.

There are different strategies to install barriers.

i. Construction of barriers **around forest areas** to keep elephant inside the forest.
ii. Sometimes barriers are constructed **across the landscape**, between tw states, two districts and even between two countries.
iii. Barriers can be constructed **around the settlement** to be protected such as a village or an enclave

Given below is a review of effectiveness of barriers for managing HEC.

Barriers achieve only partial success at best. Elephants often find their way around barriers, over or through barriers and gain entry into the desired area.

Though it is commonly used, Strategy (i) is not useful or advisable around small forest blocks because such forests cannot provide all the space and food requirements of elephant clans or even bulls. It may be moderately useful around large forest blocks that are capable of providing the resource requirements of elephant clans. They may be effective in protecting adjacent inhabitations. However it is nearly impossible to completely encircle forest blocks. Hence, barriers at the edge of forest blocks can at best be installed as a local protection measure. Barriers are more likely to be effective in case of hard boundaries where there is a clear boundary between elephant habitat and human use landscape.

If inappropriately placed, barriers have the disadvantage that they can block or alter traditional migration routes of elephants and prevent genetic interchange between populations. They may therefore, at times, be contrary to the scientific principles of wildlife management. Therefore, large scale barriers need careful study before implementation. They need to be planned at a landscape level taking into account the presence and seasonal movement patterns of elephant clans.

Strategy (ii) is practically useless because it is impossible to create effective barriers at landscape level. It is also futile to put up barriers between States/ Countries (or other political/administrative boundaries) because elephants need to move across ecological landscapes and not be confined to administrative units.

Strategy (iii) is most effective for protection of crops from elephants, but it can be used only in specific situations wherever there is a compact area that needs to be protected. Barriers are moderately effective if used to protect small enclaves. They are not so effective if used around large enclaves. In a largely agricultural landscape it becomes difficult to create effective barriers.

Involvement of the local community or the stakeholder is most important for effectiveness of barriers. The stakeholders must be actively involved in installation and the maintenance of the barrier. The process needs to be inclusive, and *Gram-*

sabha may be consulted in such discussions. Otherwise the barriers, exposed as they are to the elements, soon deteriorate and become ineffective. This is true for all types of barriers. In many states stakeholder involvement has proved ineffective because of poor interaction between the community and Forest Department.

Of the various barrier types, elephant proof trenches (EPT) require high investment and are difficult to maintain. They are prone to soil erosion, especially along slopes in high rainfall regions. The recommended design of EPTs consists of segments separated by walls – known as septa – to prevent water flow. This precaution is sometimes overlooked causing severe soil erosion. EPTs should be strongly discouraged in regions with rainfall higher than about 1500-2000 mm per annum.

Solar electric fences require lower investment than EPTs. However maintenance of solar fences by the community is generally poor. Solar fences work best when installed by institutions and individuals. Elephants are known to cross solar fences by breaking those using tusks or branches of trees.

Nowadays strong barriers are being created using steel channels, railway tracks and concrete walls. Such barriers may be successful in stopping elephants but they need high investment. They may be useful over small distances at critical locations. At a larger scale it is difficult to justify the cost.

Spikes are also being installed on the barriers as an additional deterrent measure. In one design a concrete strip is erected at ground level all around the area to be protected and metal spikes are inserted in the barrier. If an elephant steps on it, its feet pads will be seriously injured. In another design spikes are created on concrete walls or strong concrete walls. Such spikes are dangerous and may seriously injure elephants, wild animals, livestock and humans.

6. Anti Depredation Squads (ADS)

Anti-depredation squads are commonly used in North Bengal, Assam, Odisha and Chhattisgarh where large groups of elephants raid agricultural crops. ADS are equipped with a vehicle, torch, siren, fire crackers and sometimes even double barrel guns, especially in Sukhna - Mahananda region of North Bengal. The presence of ADS gives the community a sense of reassurance that the government is protecting them and their property. ADS is effective if it is managed by technically competent persons, trained mahouts and kunki elephants. It requires high level of coordination between divisions. However, the manner in which it is often implemented operations of ADS is not systematic and there is a lack of standard operating procedures. There is lot of chaos in activities of ADS, with participation of local mobs which reduces their effectiveness. Shots are sometimes fired in the

ground near the elephants to keep them moving towards the forests. Elephants, including calves, are also poked with iron spears to drive them.

7. Elephant Drives

Elephant drives are often carried out by the Forest Department. Often the aim is to drive the elephant herd out of their range so that it becomes someone else's problem. Another objective is to drive it towards the forest. Sometimes cruel scaring tactics are used to drive the elephants. In one recent case a young calf got permanently separated from the mother, and later died of stress and starvation.

In some states elephant drives are the mainstay of conflict mitigation. Herds of over 100 elephants are regularly driven towards the forests. The elephants take shelter in the forests and return to feed on crops when people go away. This to and fro movement causes stress for the elephants. They become agitated when surrounded by people. In such cases they often charge at people and the conflict aggravates.

8. Kunki Elephants

Kunki elephants are used in Assam, West Bengal, Karnataka and Tamil Nadu. Odisha FD is also building up a kunki squad. They are found to be fairly effective in driving away elephants from villages, for monitoring/capturing/ tranquilising/ translocating/ training/ hunting of problem elephants. Kunkis are generally used in unmanageable situations as a last resort. However there is high cost involved of hiring kunkis and feeding them. Sometimes, kunki elephants may not be able to reach the conflict site quickly. Moreover there are few, well-trained kunki elephants available nowadays. However, training should be imparted to elephants and mahouts to develop their skills for use during HEC situations.

9. Commonly used repellent methods

A variety of local repellant methods are used by farmers.

Loud noises and crackers

This is the most common technique used because it is simple and can be used by everyone. Typically these consist of drum beating, shouting, and bursting crackers. These measures are sometimes effective and at other times ineffective, depending on the habituation of the elephants. Male elephants are generally more resistant to such measures. Sometimes presence of a large crowd is most effective in driving away elephants. However, in certain case e.g. in urban settings and congested places crowd management becomes biggest challenge and may lead to injury to people.

Other repellent methods

Other repellent methods such as electric torch, kerosene torch (mashāl) and swinging fireball are used. These are all moderately effective if done systematically.

10. New repellent methods

Bee sound

Elephants are known to be afraid of bees. Bee sound played has been used as a repellent method in Africa and found to be very effective, especially if it is backed by beehive fences.

Carnivore sounds

Playback calls of predators such the tiger or even smaller carnivores such as leopards may evoke negative responses in elephants and keep them from entering agricultural areas.

Drones

Drones have been recently used in Africa to drive away elephants over long distances, and found to be very effective. Elephants are scared of drones and quickly run away from the site when buzzed by a drone.

Drones use the same principal as the bee fences where the sound of the drone is perceived as swarm of bees and elephants beat a hasty retreat. It is a good option to implement if the resources for drones are available. However drones are difficult to fly at night due to limited visibility. Permission from various authorities is also required to use drones, particularly near international borders. Also drones may be less useful in heavily populated areas because of the risk of trampling of crops and people by elephants.

11. Deterrent Methods

Trip alarm

Trip alarm consists of a string stretched across entry points of elephants and connected to a switch of a battery-operated electric bell. The alarm bell rings when elephants cross the trip. This gives sufficient warning to the community to come to the point and drive away elephants. Trip alarms are very effective in situations when entry points of elephants are known.

Sensor based alarm system

Sensor based alarm system could be tried to detect animals in or near village/agriculture land or even to detect elephant near railway tracks. These are solar powered infra rayed system and could be even fitted with camera and can alert villagers/ driving squad when elephants are detected close to human settlement or agriculture land through SMS/lights/sound, etc. The PRT and RRT could then come in action to drive the elephant. This will help from physically guarding the agriculture field by villagers.

Night Guarding

Night guarding is a traditional way of protecting crops against wild animals but it is falling into disuse because of disintegration of the traditional joint family system in rural India and increasing labour costs. Use of old and physically challenged persons for night guarding is known to be a major cause of human mortalities and injuries by elephants

Therefore, community guarding is one of the most effective ways of protecting crops. Farmers should sleep on watch towers created in their fields or on machans (platforms constructed on trees). This should be a community activity. It needs to be done only when elephants are known to be active in the area for crop raiding. It is more effective when combined with trip alarms.

Chilli-based methods

Chilli is known to have an irritating effect on olfactory nerves of elephants. Hence chilli-based methods are found to effective against elephants. It may also act as a psychological barrier. Chilly as a repellent can be used in the form of chilli smoke, chilli rope, chilli curtain and chilli bricks. Chilli ropes were found to be more effective against elephant family groups than bulls, and in drier regions as compared to high rainfall regions (Chelliah et al. 2010, Current Science); thus it is more appropriate to use this deterrent for only a few weeks prior to harvest of cereal crops to minimize the chances of elephants being conditioned to recognize this as harmless.

Chilli smoke is one of the effective methods as elephants are known to sneeze and cough while inhaling the smoke. Elephants change their paths if they come across chilli smoke. Chilli smoke can be generated in many ways, limited only by human ingenuity. It can be generated by incorporating chilli in slow burning grass bundles or dung cake, sprinkling on slow burning embers and camp fires.

Beehive fences

Elephants are known to be afraid of bees. In Africa bee hive fences have been found to effective in deterring elephants. A series of bee hives is created at short intervals along fences at the boundary of the enclave. The bee hives are connected to the fence. The bee hive model commonly used is the top bar model. When elephants try to enter the bees get disturbed and start buzzing around the elephant thus driving away the elephants. It is also said that if elephants encounter bees, they will alert other members of their herd through low frequency sounds (inaudible to humans). Farmers get additional benefit of income from honey and better pollination.

VHF pairing and setting up direct hotline: For avoiding rail collisions, VHF pairing with railway authorities, round the clock deployment of forest staff in control rooms of DRMs of Railways and erection watch tower and temporary sheds has to be done in strategic locations. Measures should be taken to set up direct hotlines to contact with railway authorities, where passage of elephants across railway tracks is regular.

Alternate cropping:

Alternate cropping with non-edible crops crops like chilli, citrus not consumed by elephants could be grown in forest fringes as well as areas near settlements in forest fringes may deter elephants from reaching and raiding the crop fields. Some forms of vegetative barriers may be effective.

Other methods

Elephants are known to be afraid of any unfamiliar sight, sound or smell. Therefore various inventive methods can be used that create unfamiliar visual, aural and olfactory effects can be effective in repelling and deterring elephants. The key is to keep altering the methods to prevent familiarization by the elephant.

12. Community Based Conflict Management (CBCM)

The main concept is that the community should take responsibility for crop protection with emphasis on low cost deterrent methods such as trip alarms and chilli based methods such as chilli-smoke and chilli-rope. There is strong emphasis on night guarding. In case elephants enter they are driven away by some of the repellant methods described above. In Africa studies have shown that there is an 80% reduction in crop damage where crops are protected by the community. The strategy has been found to be effective where it is implemented in Africa and India. Sometimes individual farmers proactively protect their crops but CBCM works best at the community level when all farmers come together to protect their crops. The challenge is to get communities to implement it because it needs additional work from their side and they prefer to let the Forest Department handle it. Some traditional communities are not afraid of elephants and drive away elephants effectively. When they encounter such communities, elephants prefer to change their path and go to other areas.

A large extent of elephant habitat in the north-eastern India is managed directly by the communities and CBCM in such areas is not a matter of choice but an imperative. Capacity building of the autonomous councils and Local Bodies in these areas should be carried out in the same way as that of the SFDs.

There is a lot of scope for involving communities in planning, constructing and maintaining barriers; recruiting night guards and labour for ADS / Rapid Response Teams; and verification of claims for *ex-gratia* relief. Insurance cover should be provided to the community members involved in HEC management. Selected community leaders can be recognized as Honorary Wildlife Wardens and some limited powers under Section 11 of the WPA-1972 (e.g. capturing of macaques, hunting of wild boars and blue bulls) can be delegated to them.

Logic of CBCM

The Forest Department has limited number of staff that can participate in HEC management. If an elephant enters a village the manpower available in the village is far more than the Forest Department can provide. By empowering the community and capacity building it is possible to have a much stronger manpower force for protection of crops from elephants. In many states shortage of staff is a major hurdle in HEC management and for working in cooperation with the community.

Due to natural inertia, acceptance of CBCM by the community is slow. Acceptance and implementation of CBCM is better when it is supported by the Forest Department. CBCM should be implemented through JFM committees because this is the accepted institutional mechanism for cooperation between the community and the Forest Department. An active and vigorous JFM movement is a prerequisite for effective cooperation between the community and Forest Department for CBCM.

13. Ex-gratia payment

In recent years ex-gratia for damage to crops compensation has become an important mechanism to redress grievance and assuage feelings of community affected by human elephant conflict.

Ex-gratia is paid in case of crop damage and, in some states, property damage. The damage is reviewed by an authorized officer from the Forest Department or a committee consisting of representatives of Revenue, Agriculture and Animal Husbandry Departments and Gram Panchayat members. A compensation case is prepared and submitted to higher authorities for sanctioning ex-gratia according to rates prescribed by State Government GRs or GOs.

In case of injuries to human beings the affected person is provided treatment by the Forest Department free of charge and may be given an additional ex-gratia. In case of human deaths the Forest Department provides ex gratia payment to next of kin of the deceased at State Government approved rates.

This system of ex-gratia has helped to assuage the feelings of the persons affected in the case.

The main criticisms of these schemes, especially by the farmers, have been as follows:

i. The ex-gratia rates provided in case of crop damage are insufficient
ii. The ex-gratia process is too lengthy and time consuming so many affected persons prefer not to file complaints
iii. The ex-gratia is disbursed too late

There is some merit in all these points. Ex-gratia rates are indeed low in many states. In some states, because of shortage of funds, only some farmers are given ex-gratia. On the other hand, studies have shown that farmers often perceive the crop damage to be higher than actual, so their expectations are also higher. In some states the excessively high ex-gratia rate can give rise to fraud claims.

In some states ex-gratia is paid very late while it is very efficient in other states. In Karnataka, in some divisions, the ex-gratia is given within two weeks. Karnataka is in process of incorporating crop damage ex-gratia in its HULI software/ app that will enable much faster resolution of ex-gratia cases.

A novel method of community-assessed ex-gratia for crop damage that is resistant to cheating is worth trying on a pilot scale in some regions (Watve et al. 2016, Global Ecology and Conservation).

The ex-gratia rate for human deaths due to elephants varies from state to state. The rate provided by Government of India is Rs. 2 lakhs. The maximum ex-gratia, in Maharashtra State, is Rs. 8 lakhs. The Gajah (Elephant Task Force) report has recommended that ex-gratia in case of human death should be at least Rs. 5 lakhs.

As ex-gratia support for crop loss by elephants, the farmers could be provided with *"grain for grain"*. This is aimed at providing grain as a replacement for the crops lost by the farmers due to elephant depredation as an alternative to the scheme of providing monetary relief as ex-gratia support to the farmers. The scheme also helps to promote food security (money not being used for other purpose) to the affected people with the idea of providing grain to compensate for lost grain aiming to prevent retaliatory attacks.

PROPOSED STRATEGY

The HEC management practices often have a short term objective of crisis management. However for effective management of HEC one needs to have a long term strategy. The guidelines presented herein are presented specifically for managing human elephant conflict. It needs to be dovetailed with other strategies, such as landscape habitat planning, protection of corridors, habitat management,

consolidating elephant habitat, managing elephant population through reproductive control* measures as well as limited capture where essential for a more comprehensive solution.

14. Community Involvement and Empowerment in HEC management

14.1 Advantages of community involvement in managing HEC

The Forest Department frontline staff is often burdened with several responsibilities. They are unable to devote sufficient time and attention to managing HEC. Neither do they have sufficient manpower to counter HEC on their own. Involvement of the community in HEC management is known as community based forest management (CBCM). CBCM is a means of empowering the community to share responsibility of HEC management with the Forest Department. The advantages of CBCM are:

- The community members are already present at the site so they are capable of more rapid response
- They have a vital stake in protecting the crops and property
- The community has far more manpower than does the Forest Department
- They often have detailed knowledge of the village layout compared to Forest Department

In the beginning it may be difficult to involve the community in HEC management. There is commonly reluctance on part of the community to participate in HEC mitigation activities. This stems from the community attitude that HEC management is the Government's responsibility. At the outset this attitude needs to be changed in order to gain participation of the community in HEC mitigation. The community needs to be told that HEC management is a partnership between the community and the Forest Department, and the community stands to benefit considerably from protecting their own crops. Building confidence and capacity of the community is the next step to achieve success in CBCM.

In some states communities are already involved informally in HEC mitigation. However in most states it is the Forest Department that manages HEC. It is suggested that a CBCM program should be implemented through JFM/ EDC committees, wherever they exist, or through the Gram Sabhas, where there are no JFM committees. The Forest Department should play a strong role in hand holding and capacity building. Good relations between the Forest Department and the Community are essential for promoting CBCM.

Other stakeholders should also be involved in HEC management according to the local situation. Some of these are tea estate owners, coffee estate owners and local institutions.

* At present the Hon'ble Supreme Court of India has barred State Forest Departments to take up control of elephant population through immuno-contraception methods under WP (C) 107 of 2013 Shakti Prasad Naik Vs Government of India and others. The Ministry of Environment Forests and Climate Change and West Bengal Forest Department have filed affidavit in the Supreme Court of India to permit elephant population through immuno-contraception methods. The case has not come up for hearing till date.

14.2 Hierarchy of HEC mitigation measures

The commonly accepted hierarchy of mitigating any kind of impact is:

Avoid > Minimize > Restore

Analogous to this strategy, in case of HEC mitigation, the recommended hierarchy of mitigation measures is:

Deterrent measures > Early warning systems > Repellent measures > Compensation

The first priority should be to prevent elephants from entering agricultural fields. To achieve this, deterrent measures should be adopted. If deterrent measures fail, early warning systems will give alarm of elephant presence and enable the community to drive away the elephants. In spite of this if elephants enter agricultural fields, then repellent measures should be used as a last resort to drive away elephants. If the measures are not successful and elephants damage crops, compensation should be paid to the affected farmers.

14.3 Strengthening capacity of communities

Capacity of communities should be strengthened by providing them required support in terms of equipment and material. Within each JFM committee crop guarding squads should be set up for crop guarding and elephant scaring. The crop guarding squads should function as a unit.

The most basic equipment for community guarding of crops is an electric torch. Powerful LED torches are available cheaply nowadays. All communities should be provided such LED torches for anti-depredation work. For this purpose yardsticks should be decided such as one torch for a certain number of households.

Other material may be provided for crop protection such as firecrackers.

14.4 CBCM techniques

Deterrent techniques

Communities should be trained in deterrent techniques for protection of crops from elephants and preventing elephants from entering crop fields. Chilli-based deterrent techniques such as chilli rope and chilli smoke have been found to be very useful in certain situations. Techniques based on sound of humming bees and beehive fences have been found to be useful in Africa and need to be tried in India.

Early warning techniques

Night guarding on watch towers, *machāns*, or any tall structure is one of the most effective early warning and deterrent techniques. Trip alarm has been found to be effective to give early warning of elephant arrival. Night guarding supported by trip alarms is very effective in deterring elephants.

Bulk SMS alerts

In Valparai Plateau in Tamilnadu SMS alerts have been found to be useful in informing people of elephant presence in the area. This system has helped to reduce accidental encounters between elephants and people and has reduced mortalities of people in the area (The SMS alert system is useful in specific locations where there is a problem of regular encounters with elephants). In areas where there is crop damage the farmers require support in preventing elephant entry in their crop field. Also SMS alert requires investment in technology therefore the farmers is dependent on either the Forest Department or an NGO.

SMS alerts have also been used successfully in west Bengal to alert railway authorities about presence of elephants on railway tracks to minimise death of elephants due to train hits.

Repellant techniques

Crackers and drum beating are the most common repellent measures but their effectiveness is low in most situations because elephants have become habituated to them. Some innovative local repellent techniques, such as swinging fireball, have been found to be moderately effective for driving away elephants.

Communities are resistant to adopting new methods. NGOs should be involved in motivating and training the community in different crop protection techniques.

A manual should be created for deterrent techniques and repellent techniques of crop guarding by community. This manual, translated into local language, should be widely distributed in the Forest Department and to other stakeholders.

Community crop guarding techniques are to be situation specific. All techniques may not be applicable to each situation. Techniques should be identified that are useful

for specific situations. Simplified booklets in local language that are useful for the local situation should be distributed to the community.

14.5 Dissemination

Training workshops should be conducted for Forest Department frontline staff in community crop guarding techniques. The frontline staff in turn should train the community in these crop guarding techniques. Literature and training manuals should be made available in community crop guarding techniques to the frontline staff and community.

15. Implementation of Barriers

15.1 General guidelines on barriers

Barriers should not be created across the landscape or along administrative boundaries. Such barriers are useless because they invariably have gaps such as roads, streams and rivers that elephants can use to pass through.

It is found that barriers are most effective when they are used to keep elephants out of small blocks of land such as a small hamlet or an institution. They are less effective when used around large blocks of land, such as large villages.

15.2 Barriers on forest boundary

Barriers should not be created around small forest blocks of a few square kilometers in size because they are not very effective.

Barriers may be created on larger forest boundary if there is severe human elephant conflict. In such cases barriers should be created only if the following conditions are satisfied:

- The boundary is "hard", i.e. there is a clear and sharp demarcation between forest and human landscape.
- The boundary is fairly straight without much convolution.
- The boundary should not be broken by roads, river or large stream because such openings will leave gaps for elephants to move in and out, thereby defeating the purpose of creating the barrier.
- The local community should not have an interest in entering the forest for grazing their cattle or collecting firewood because they will create openings or crossings that will defeat the purpose of creating the barrier. In some cases appropriate gates may be tried.

Barriers on forest boundary, if created, should be used only as a local measure for controlling local HEC. Barriers should never be created around the entire forest block if this is small, because this will confine the elephant population and compromise their long term genetic viability.

If barriers are to be created a map should be prepared showing location of elephant groups, seasonal migration patterns of elephants and locations of elephant corridors. The map should show location of proposed elephant barriers. A proposal should be prepared with all information and submitted to the Project Elephant Director of the state. Who will take a decision about it after reviewing the entire information and take the advice of elephant experts when needed.

15.3 Types of barriers

Elephant proof trenches should be installed with discretion only where the situation demands. They should not be constructed in sloping or hilly terrain or in regions with high rainfall (1500-2000 mm per annum and above). Technical specifications of EPTs recommend internal walls, known as *septa*, of 10-20 cm width, at intervals of 10 to 20 metres, to divide it into segments so that water does not flow along the EPT and cause soil erosion. These specifications should be adhered to.

Solar (high voltage) electric fences should be installed only under specific situations such as to protect small enclaves, institutions and individual farms. Community involvement is essential for maintenance of solar fences. Written agreement should be made with the community that they will take responsibility for its maintenance. Communities should be given monetary support for maintenance of fences provided they take responsibility of maintenance.

Barriers with sharp spikes that have potential to injure elephants, wildlife, livestock and humans should be strongly discouraged.

16. Anti-depredation squads (ADS)

Anti-depredation squads (ADS) are an essential component of HEC management in some states such as West Bengal and Assam. In these states groups of elephants congregate and enter human use areas in large numbers. In such situations the local community needs the support of the ADS to protect their crops and property.

ADS should be well equipped and the State Government should provide sufficient funds to ensure this. Each ADS should be supported by at least two kunki elephants. However, the use of guns by ADS needs to be strictly controlled. ADS should also not be allowed to use spears and sharp instruments.

ADS should be composed of trained staff with technical knowledge of elephant behaviour and elephant management techniques. ADS should work in a planned manner. At the beginning of every season training sessions should be conducted for ADS. Trial runs and mock operations should be carried out before the main HEC season. Senior forest officers should take interest in operation of ADS and should participate in some ADS operations. Coordination between territorial and wildlife

divisions supervised by a senior forest officer is very important for effective functioning of ADS.

ADS should use humane techniques to drive away elephants. They should not fire at elephants, poke them with sharp instruments or beat them with sticks. ADS staff should be sensitized to humane management of elephants.

When the elephant herd splits into smaller groups it becomes difficult for the ADS to manage the group. ADS should work in partnership with the community so that the community can manage the situation, where ADS cannot reach. This requires empowerment of the community with equipment, material and training. Such operations should be monitored to ensure that the community does not misuse the capacity delegated to it.

17. Compensation (Ex-Gratia Payment)

The rates for crop compensation should be commensurate to the crop damage. It is recommended that compensation for crop damage should be about 60% of the estimated crop damage. If the compensation is close to 100% of the crop value there will be no incentive for the farmer to protect his crops.

Adequate financial provision should be made for compensation for HEC by the states with support from Project Elephant.

The process of spot inspection, preparation of case papers, forwarding to higher authorities and award of compensation and payment should be expedited. Procedural changes should be made by the states wherever necessary. Ready to fill formats should be circulated so that the inspecting staff does not have to write long descriptions. Cases should be received by the Range Officer, or even the Beat Officer, so that the affected farmers do not have to travel long distances to file the case or receive compensation. The entire process should be time bound. It is recommended that farmers should receive compensation within 15 days from date of the incident.

False compensation claims should be detected and rejected. Above a certain value, revenue authorities should be involved. If the amount is high, a gazetted officer should do the inspection. If the value is exaggerated, there should be penalty for false claims.

Computerization of cases of crop and property damage by elephants should be initiated by all states to hasten the process of compensation. A database should be prepared so that the data may be used in future use and manipulations are reduced.

In case of human injury the victims are sometimes seriously injured and lose their jobs and livelihood. Provisions should be made for free treatment in Government

hospitals. If medicines are not available, the hospitals authorities should make the arrangement or send the patient to better hospital at their cost. The costs should be reimbursed to them directly by the Forest Department without involving the patient. Medical treatment continues long after discharge from hospital and considerable expenses are incurred. The Government should pay these expenses as long as the treatment continues, even if it takes a year or two. The affected person should be suitably rehabilitated. NGOs with appropriate expertise should be involved so that they can do the necessary hand holding for rehabilitation of the person.

In case of human death the compensation should be minimum Rs. 5 lakhs. In such cases also an NGO with requisite expertise should be involved to rehabilitate the next of kin.

18. Crop Insurance

The Pradhan Mantri Fasal Bima Yojana (PMFBY), which was introduced in 2016, provides insurance to a wide variety of crops at a very low premium. The MoEFCC has requested for inclusion of crop damage by wild animals in the scheme. As and when this feature is incorporated in the scheme the State Governments and the Forest Departments should promote this scheme vigorously in regions where there is crop damage by elephants and wild herbivores.

19. Elephant Drives

Elephant drives with the objective to push elephants from one administrative area to another should be avoided. In no situation elephants should be driven for long distances. This causes stress to the young calves in the group and they may die. Elephant drives, if at all they are carried out should be solely with the intention of herding elephants away from a human populated zone. In some situations elephants may be herded away from hazardous situations such as at international boundaries where they may be endangered. Once they are outside the human use zone or the danger zone they should be left alone. Care should be taken to ensure that the driving operation does not split the herd. This increases the conflict and also disturbs the social structure of elephant groups.

20. Early warning SMS alert systems/WhatsApp Group

Systems based on laser beams have been used on Valparai Plateau in Nilgiri Hills, Tamil Nadu to provide early warning of elephant arrival. A system of sending SMS alerts of elephant presence has been developed to warn of elephant presence. A system of pulsating warning lights on towers that warns of elephant presence in the area has been developed. These methods are useful in reducing incidents of human mortality due to encounter with elephants. These methods are useful in situations

where encounters with elephants are high. Warning about elephant presence may also be advertised through local/ cable TV channels. They should be implemented in other areas where similar situation exists.

Early warning system through WHATS APP and regular broadcasting of herd locations every day and their possible route may also be followed.

21. Primary Response Teams & Rapid Response Teams

In some areas elephants are prone to enter high population density areas in large numbers. In such situations quick response by the Forest Department is important for preventing loss of human life or damage to property.

ADS have worked reasonably good in North Bengal but ADS cannot reach out to all places. We need to develop primary response team (PRT) in each village who could work as first level of defense to drive the elephant and keep crowd away till the time the Rapid Response team (RRT) reaches. The RRT should ideally consist of a biologist, veterinarian and a biologist to address all aspect of the conflict. Both the teams have to be adequately trained and equipped in HEC mitigation. The PRT and RRT should also be insured to take care of their families in cases of accidents/ deaths during HEC mitigation and continuous medical facilities be provided in case of severe injury till the person recovers.

These teams should work in a planned manner and carry out the operations quickly and effectively. Their main job should be to herd the elephants away from human inhabited areas. They should be well equipped and disciplined. A 24 hour control centre should be formed in critical areas and the toll free telephone number of the control centre should be given wide publicity. Such a strategy has been used effectively by the Tamil Nadu Forest Department in Valparai Plateau and by Chhattisgarh Forest Department.

22. Minimizing Human Encounters with Elephants

Human injury and deaths are the result of human encounter with elephants. The key to minimizing loss of human lives is minimizing unexpected encounters with elephants.

In some regions for e.g. Valparai encounters with elephants often take place in low light conditions when people bump into elephants accidentally when returning from work in the evening or going for work in early morning. A large number of cases of human deaths / injuries in the country involve people who trespass into elephant habitats or indulge in collection of timber, firewood, fodder, tendu leaves, mahua and other NTFPs. The villagers visiting forests for attending nature's call often fall

victims to elephants. Elephants are also known to be attracted by country liquor stored in houses. The possibility of fatal encounters is higher when the person is alone. Knowledge of these factors can help to prevent such encounters.

At the beginning of each HEC season the Forest Department should launch an awareness campaign about important Dos and Don'ts for avoiding chance encounters with elephants.

In regions where possibility of such encounters is high public alerts should be sent about presence of elements. The SMS alert system implemented at Valparai is a good example of the effectiveness of this system.

23. Capture and relocation of elephants

In regions where elephants have moved out of the more intact forest areas, especially protected areas or large reserve forests, into human-dominated landscapes primarily for crop raiding, the levels of chronic conflicts are usually unacceptably high. These elephants may either be solitary bulls or bull groups, as well as family groups. Usually these elephants become virtually resident in commercial plantations such as coffee estates, orchards or small plantations that offer excellent canopy cover, or use smaller patches of forest (such as those regenerated under Joint Forest Management programmes) to take shelter during the day and raid the surrounding crop fields at night. Examples of these situations include districts in Karnataka such as Hassan and Kodagu with extensive coffee plantations, and southern Bengal with regenerated forests under JFM.

There may be no other option but to capture these elephants. The question then arises as to what should be the course of action after capture; should the elephants be released back into a forest or should they be retained in captivity. The first option is obviously the more desirable one when this is feasible. If a state has forests suitable for relocation, the option of releasing the elephants there should be first examined. There are indications that subadult or young adult bull elephants of the age of emigrating from their natal families are likely to settle down in another forest area through such "assisted dispersal". However, it should be emphasized that there is no foolproof guarantee of success in relocating elephants that have been in conflict with people. This is a learning process in elephant management. In the past, most experiments in capturing and relocating adult male elephants have failed with the bulls going back to their original place of capture. Relocated elephants should be fitted with GPS-based collars to monitor their movement with the option of recapturing them in case they again come into conflict. The site of release should be at sufficient distance (typically of the order of 200-300 km or greater) such that it is unlikely that the elephant would be familiar with the new site and attempt to go back to the place of capture. "Soft release" options can also be experimented with;

this would involve keeping the animal in a stockade for some limited time period at the proposed site of release before letting it free.

In some instances the best option or the only option may be to retain the captured elephant or elephants in captivity, especially if the animal has killed people on multiple occasions and the risks of release into the wild are too great. In recent times, Karnataka and Tamil Nadu have exercised this option after seeking expert opinion. Only some states have the skills to capture and train large bull elephants, and other states should build their own capacities with the assistance of the former. If elephants are retained in captivity it is essential to consider their use and their welfare.

The availability of immobilization drugs and competent veterinarians during capture operation are important issues and these should be made available to SFDs all the time.

24. Reducing Retaliatory Killing of Elephants

Communities affected by HEC sometimes resort to retaliation against elephants that can result in their death. Electrocution is one of the common methods use for killing elephants. There are cases where the electric wire was set for other animals like wild pig or gaur and resulted in death of elephant. There is a need to introduce people to the safer option of using power fences to protect crops rather than using unguarded electric wires (power lines). Poisoning due to retaliation is also a major cause of killing of elephants. In other cases people have been known to shoot elephants. The animals are either buried (a herculean task) or the death is faked as accidental death. Sometimes bullet wounds don't kill the animal immediately but it dies a slow death later due to infection of wounds.

At the beginning of each season the Forest Department should hold meetings in all villages and warn people against using practices such as electrocution or shooting. They should be informed about the seriousness of the offence and option of legal action against the culprits in case deliberate killing of elephants.

The various measures outlined in these guidelines will help to reduce retaliatory killings. Generation of sympathy towards the animal can play a major role in reducing such killings.

25. Seasonal Planning for HEC Management

There should be effective planning at the forest division level and range level for management of HEC at the beginning of each season. This local knowledge should be tapped and used for planning HEC management for the season. Responsibilities should be allocated and strategy for HEC management should be decided.

Similar planning workshop should be held at forest range level for all the frontline staff of the range to plan HEC management for the entire season.

26. Documentation of local knowledge

In each region there is considerable local knowledge about seasonal elephant migration routes, elephant groups and their sizes, entry points and crop raiding patterns. This information is available with the field staff but generally not documented. This knowledge should be documented for use of elephant conservation and elephant management in future years. The documentation should be done in a simple format circulated by the Chief Wildlife Wardens. These documents will provide valuable information that will help in HEC management. It can also form basis of elephant conservation in the state.

27. Mob Control

Often presence of mobs makes management of HEC situations very difficult. Sometimes human deaths take place when people get in the way of fleeing elephants. In such circumstances mob control becomes an important part of HEC management. An effective mob/crowd control plan should be chalked out in areas where such situations are frequent. Help of District Administration particularly Police Department should be taken for mob control. For this communication and planning with the Police Department is necessary at the start of the HEC season. Police officers should be educated and trained about management of elephant groups so that they take prompt and effective action in such situations.

28. Managing Private and Temple Elephants

There are several instances of private elephants and temple elephants getting scared and going out of control, often during processions, due to loud music, crackers and presence of large crowd, etc. As far as possible, elephants should be kept away from congested places and large crowds. Assembly of elephants in temples or other public places should not be permitted unless the organizers have taken adequate measures to deal with any emergency. It should be ensured that the elephants, particularly bulls, participating in public functions are manned only by trained and experienced mahouts. A dossier should be maintained of all elephants which have the history of being ill-tempered. Standard operating Procedures (SoPs) should drafted for tackling such situations. Rapid response teams should be formed by the Forest Department in big cities to tackle such situations.

Captive elephant welfare committees should be constituted at State and District levels to ensure welfare and humane treatment of captive elephants, particularly in private custody. Chief Wildlife Wardens should periodically monitor ownership certificates/ microchips of elephants. The implementation of the guidelines for

welfare and management of captive elephants, issued by the Ministry on 8.01.2008, should be enforced in letter and spirit. The Ministry has also issued on 29.09.2017 standards/ norms for giving recognition to elephant housing facilities for captive elephants, including temple elephants.

29. Managing Transboundary Elephant Movement

Some elephant populations are known to regularly cross international and state boundaries. In India this occurs regularly on the international boundary with Nepal, Bangladesh, Bhutan and Myanmar. Elephant populations regularly cross interstate boundaries in many elephant states. There is a tendency to push the elephant populations back to the home state/country using harsh methods, resulting in much hardship to elephants, especially young calves. Elephants are even shot with 12 bore shotguns. The gun shots cause injury and death of elephants due to festering wounds. Such injured elephants are extremely dangerous. All efforts should be made to avoid such practices.

Interstate coordination committees should be formed at the local level and at the level of Chief Wildlife Wardens. They should meet regularly, share information and plan for management of elephants. The practice of coordination committees should be followed even within the state between neighbouring divisions and between territorial and wildlife divisions. The Central Government has signed a MoU with the Government of Bangladesh for transboundary conservation of elephants in India Bangladesh elephant landscape on 27.7.2017 at Shillong. The Joint Working Group has been constituted by two countries to develop standard operating procedures and protocol for conservation of elephants. Similar arrangements should be established with other neighbouring countries e.g. Nepal, Bhutan and Burma.

Sympathy is needed by forest officers and people on both sides of the boundary. Strong communication should be established between forest officers on both sides to ensure that no harm comes to elephants. Elephants should be allowed to follow their natural migratory paths. Preparations should be carried out to ensure that there is minimum damage and hardship to people during their stay on the other side of the boundary. The recommended strategy in such cases should be to prevent the movement of elephants to undesirable areas with the help of suitable barriers and to translocate / capture the straying elephants. The more experienced and knowledgeable partner should share their knowledge of elephant management and, if necessary, conduct training session for the partner on the other side of the boundary to help in managing HEC. Such dialogue should continue throughout the HEC season.

Elephants are known to be expanding their range to non-elephant districts of Northern Andhra Pradesh, Chhattisgarh, Bihar, MP, Maharashtra and Goa. Similarly, suitable elephant habitats no longer exist in parts of Nepal adjoining North Beng

Elephants are known to be expanding their range to non-elephant

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suitable elephant habitats no longer exist in parts of Nepal adjoining North Bengal and parts of Bangladesh adjoining Garo Hills (Meghalaya). The recommended strategy in such cases should be to check the movement of elephants to undesirable areas with the help of suitable barriers and to translocate / capture the straying elephants.

30. Rescue and Rehabilitation Centers

A number of elephant rescue and rehabilitation centers have been formed in the states, with support from Project Elephant. Some of these centers do not have requisite approval of the Central Zoo Authority (CZA). All elephant rescue can rehabilitation centers should get approval of CZA and follow CZA guidelines for their management. Other states that have presence of elephants should also set up at least one elephant rescue and rehabilitation centre. Elephant rescue and rehabilitation centers should be well managed and should be provided adequate funding.

Chief Wildlife Wardens should ensure that Rescue and Rehabilitation Centers for elephants as well as housing facilities for captive elephants are maintained properly to avoid complaints about cruelty/ ill treatment of elephants, received from various quarters.

31. Training of Mahouts and Kawadis

India has a long history of keeping elephants in captivity. The relationship between elephant and mahout is very complex. It is essential that mahouts and kawadis are imparted training regularly in proper handling of elephants. Registration of mahout/kawadis as trained and licensed handler of elephants with the forest department also needs to be considered.

32. Humane Treatment of Elephants

Though elephants have to be kept away from human use areas the techniques used should be humane and should not cause harm or suffering to elephants. This is especially true in case of some harsh techniques used by anti-depredation squads and frontline staff during elephant drives. Communities also need to be educated about humane treatment of elephants.

33. Attitudinal Change

A campaign for creating awareness of elephant needs to be instituted. The Elephant Task Force has also recommended a campaign named *Hathi Mere Sathi* for this purpose. Communities also need to be educated to take responsibility in managing HEC. The community should be educated about habitat fragmentation due to

encroachments and it role in increasing HEC. There is also a need to extend educational and awareness programmes for the development agencies, railways, power, irrigation,, highways, mining companies, tourism industry, district administration, etc.

34. Communication

Effective communication is an important aspect of managing HEC. The recommended communication flow is given in Figure 1. The flow chart is indicative only and not meant to imply that communication flow is one way.

The Chief Wildlife Warden and PA Managers/ DFOs should decide the policy and strategy for managing HEC for the entire state. They should decide the publicity literature and training material for the frontline staff and the community. This information should be communicated to the field officers.

Figure 1: Chart for Flow of Communication of HEC Management Strategy & Literature



Figure 1

The Field officers will communicate the HEC management strategy to the frontline staff along with detailed planning for their forest divisions. They will provide the communication literature to the frontline staff. They will conduct trainings for the frontline staff for implementation of HEC management in the field.

The frontline staff will communicate the HEC management techniques to the community along with the publicity and awareness literature. They will train the community in HEC management techniques.

Communication channels between the community and Forest Department should remain open at all times to ensure good management of HEC. The community should be informed contact numbers of the local member of frontline staff in case of arrival of elephants or crop damage. SFDs also need to set up a grievance redressal system for communities and the frontline staff.

35. Training of frontline staff and farmers

Training goes hand in hand with communication. Frontline staff as well as community should be trained in techniques for management of HEC. At present the most commonly used techniques are noise making techniques followed by drives. The stakeholders should be educated in alternative techniques for deterrent

measures, early warning systems and effective repellent techniques. The training program should be coordinated by the State Director, Project Elephant.

36. Research and Development

Elephants are highly intelligent animals. They soon learn about HEC mitigation measures and become habituated to them or learn to circumvent them. Therefore many HEC mitigation measures gradually become ineffective. New techniques should be constantly introduced to keep elephants away from human use areas. Methods should be constantly altered and modified to avoid habituation by elephants. The Forest Departments, research institutes and NGOs involved in elephant conservation should carry out experiments to develop novel techniques for mitigation of HEC. The PE Division should play a nodal role in disseminating this information to the states by conducting workshops and circulating reports and publications.

We should also upfront ask for a comprehensive policy framework for elephant-human conflict mitigation. Guidelines can only be framed to help implement a policy.

Research should be carried out on a number of repellants and deterrents that need to be tried and tested in the Indian conditions before applying on a large scale to mitigate HEC.

Climate change is likely to be a major factor in near future influencing elephant behavior and habitat thereby leading to escalation of HEC. Research is required to understand the possible impacts of climate change on elephants and their habitats and develop plans for mitigating adverse impacts.

Research and Development is also required for developing reproductive control measures (using immuno-contraceptives or any suitable alternative) and protocol for dealing with local abundance of wild elephants leading to high levels of HEC and regulating captive elephant populations in camps.

There is lot of data being maintained by SFD on conflict but not effectively used except for ex-gratia support. There is no systematic analysis of the data at landscape level to understand the pattern and level of conflict and to predict the overall trend and places of conflict hotspots based on which mitigation measures could be planned and adapted. The information could also be analyzed based on LULC the landscape to understand the main drivers of conflict and plan accordingly.

37. Assessment of HEC zone

A data base has to be maintained by each state for effective assessment of damage and compensation. But the data has to be also analyzed extensively to understand

the pattern of conflict, trends and identify conflict hotspots to predict the trend and places of conflict based on which mitigation measures could be planned and adapted.

The HEC zone should be assessed and mapped for deciding on the type of intervention to be taken for conflict mitigation. The vulnerable areas should be identified and the damage to crops and human deaths should be assessed across landscape.

38. Implementers of guideline/Involvement of Stakeholders

Multiple stakeholders like MoEFCC; Ministry of Agriculture (including Department of Animal Husbandry), Ministry of External Affairs (MEA); Research Institutes; State Departments of Finance, Agriculture, Animal Husbandry and Health; District Administration; Local Bodies; Police; linear developmental agencies (Railways, NHAI, power, etc), Ministry of Homes, District Administration and Civil Societies should be involved along with the State Forest department and local communities for effective planning and implementation of mitigation measures. With so many agencies being responsible for executing the guidelines, a coordinating mechanism must be put in place.

39. Enrichment of deemed forest:

There are some good patches of 'deemed forests' or forests not under the forest department, though classified as forest according to the judgment of the Hon'ble Supreme Court. Some of them are degraded, but can be improved as good elephant habitats. They need be enriched to serve as elephant habitats.