**IN THE HON'BLE NATIONAL GREEN TRIBUNAL,
EASTERN BENCH, KOLKATA**

ORIGINAL APPLICATION No. 176 of 2023

IN THE MATTER OF:

Re: 3 elephants run over by goods train in Buxa Tiger Reserve news item published in the Times of India dated 28.11.2023 *(Suo Moto)*

.....Applicant

VERSUS

Field Director, Buxa Tiger Reserve, Alipurduar & Ors.

.....Respondents

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Kolkata
Dated : 22nd January, 2024

Respondent No. 4

Through

Dibyendu Narayan Ray
Advocate

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REPLY AFFIDAVIT ON BEHALF OF THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE (Respondent No.4)

I, Shri Sujoy Dutta, son of Shri Samir Dutta, aged about 43 years, presently working as Assistant Commissioner (Forestry) at the Sub Office Kolkata of Bhubaneswar Regional Office under the Ministry of Environment, Forest and Climate Change, having its office at IB-198, Sector- III,Salt Lake City, Kolkata – 700 106, do hereby solemnly affirm, declare and state as follows:

1. That I am working as Assistant Commissioner (Forestry) at the Sub Office Kolkata of Bhubaneswar Regional Office under the Ministry of Environment, Forest and Climate Change (hereinafter referred as MoEF&CC).

2. That I am fully conversant with the facts and circumstances of the case from records maintained in the office. I have read and understood the contents of the petition thereof and as such authorized and competent to swear present affidavit.

3. That the State Government is main replying respondent to this application and can address the issue much more comprehensively before this Hon'ble Tribunal and comply to the directions of Hon'ble National Green Tribunal (hereinafter referred as NGT), if any.

4. That it is also pivotal to underscore that dedicated mitigation

works for curbing elephant deaths by running trains, have been put by MoEF & CC in collaboration with Indian Railways. These mitigation initiatives include:

- Joint advisories by the MoEF&CC and MoR have been issued to States/UT Forest Departments, emphasizing regular patrolling, clearing vegetation along the tracks to improve visibility for the loco pilots, placing signages at sensitive locations to caution the railway crew and improving waste disposal techniques to keep railway tracks free from food wastes etc. The same has been annexed as **Annexure I.**

- The Project Tiger & Elephant Division, MoEF&CC along with World Wildlife Fund, India and Wildlife Institute of India (hereinafter referred as WII) had come up with a pictorial, ready-to-use manual on human-elephant conflict management. The English version of the manual was released by the MoEF&CC during the 16th Steering Committee held at Dehradun. The Field Manual aimed to provide the Forest Department officials, a set of best practices to reduce human-elephant conflict and promoting both human well-being & elephant conservation. The document is intended to provide a coherent, systematic approach to deal with human- elephant conflict that is based on effective work by State Forest Departments and civil society, over the years. Due to overwhelming demand for the manual, the manual even has been translated to Hindi, Assamese and Malyalam languages as well.

- The Ministry has released the Guidelines for Human- Elephant Conflict Mitigation (2023), taking a harmonious coexistence approach for addressing human-elephant conflicts. The Guidelines have been prepared with technical support of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), India. The guidelines aim to redress multiple issues, arising out of human-elephant conflict situations. The same has been annexed for the perusal of Hon'ble Tribunal as Annexure II.

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- Regular inter-ministerial meetings have been constantly organised with Ministry of Railways (hereinafter referred as MoR) and State Forest Departments (hereinafter referred as SFDs), in order to holistically address the issue of rail-induced

elephant mortality.

- The Ministry had also constituted a Committee, as decided by the Central Project Elephant Monitoring Committee (hereinafter referred as CPEMC), in its meeting dated 28.07.2021, to review the deaths of elephants due to train hits in the States of Tamil Nadu and Kerala. This decision of CPEMC was in compliance of direction of Principal Bench, Hon'ble NGT dated 08.07.2021 in O.A 142 of 2021. The Committee submitted its Report to the MoEF&CC in September, 2021 suggesting recommendations to be taken up by Railways, SFDs of Tamil Nadu and Kerala to prevent death of elephants due to train hits. The Report submitted by the Committee has been circulated to the SFDs, Railways and other concerned stakeholders to take appropriate measures to prevent death of elephants due to train hits. The copy of order dated 08.07.2021 has also been annexed as **Annexure III.**

- A permanent Co-ordination Committee has been constituted between MoR and MoEF&CC for preventing elephant death due to train accidents.

- MoEF&CC, time to time assessing the efficacy of preventive measures, employed to abate elephant deaths by train hits. A Committee was constituted by MoEF&CC to assess effectiveness of mitigation measures employing advanced technology, in order to prevent mortality of wildanimals due to train hits. The Committee assessed the Distributed Acoustic Sensors (hereinafter referred as DAS). The Committee has suggested to install more such systems at critical stretches. MoEF&CC has also requested MoR to install more DAS, at other sensitive locations identified by MoEF&CC and Wildlife Institute of India, so that, the purpose may be well served. The copy of letter to MoR has also been annexed as **Annexure IV.**

- Recently, 110 critical sites in a stretch of 1800 Kms on existing railway lines, across the country have been identified by the MoEF&CC, in consultation with the SFDs and submitted the same to the MoR, for undertaking mitigation strategies. These mitigation strategies may include construction of underpasses, overpasses, imposing speed restrictions, creating level crossings & ramps to facilitate elephant movement and developing technological interventions

to better detect elephants along the railway tracks.

- The General Guidelines for Suggesting Mitigation Measures on Railway Tracks passing through Elephant Habitats in India, have been prepared and circulated to all the States/UTs for implementation in May, 2023. These Guidelines would be a guiding document for the Railways and Forest Officials in designing and choosing between different structural mitigation measures in the identified critical elephant zones, intersected by railway lines. The kind of mitigation measures to be opted by any State/UT, can be chosen on the basis of landscape, topography, railway track height, and other logistics of the area concerned.

5. That it is also being most respectfully submitted that National Tiger Conservation Authority, MoEF&CC in respect of preventing elephant deaths due to train hits, has also provided many suggestions to the States/UTs in form of advisory dated 22.08.2013 and the same has been annexed as **Annexure V.** These include:

   i. Identification of sensitive tracks based on past data.

   ii. Deployment of trackers to provide information to focal points in railways about elephant movement during train timings. (Focal points at local, appropriate levels are required in railways as well as Forest Departments.)

   iii. Speed regulation (with double engines for ghat sections). This is more important in wildlife rich areas, since, apart from elephants several other wild animalsmay die due to train hits.

   iv. Barricading appropriate sensitive stretches with used railway lines from railways (needs to be provided at free of cost to Forest Department), while leaving corridor gaps for elephant movement.

   v. Installing a 24x7 infra red/thermal, intelligent cameras (e-surveillance) at the corridor gaps for obtaining alerts in special railway control room.

   vi. Initiating a scheme for engaging nearby villagers and

nominating 'village level informers' to inform about elephant movement, during train timings, with provisions for due remuneration to them.

vii. Periodic review of agreed actions between railways andforest departments, to ensure their strict compliance.

viii. Reducing the slope of embankments along railway tracks in sensitive areas.

6. That the Project Elephant, MoEF&CC with the support of Elephant Cell, WII have organized the multiple capacity building workshops for different stakeholders involved in elephant conservation efforts, for securing best interests of elephant species. These can chronologically, be depicted as:

- Refresher's course on Elephant Healthcare and Managerial Practices for Veterinarians of all Elephant Range States was organized from 22-28 November, 2022 at Assam Agricultural University, Guwahati, Assam.

- Stakeholders workshop held on 30.11.2022 for finalizing the Zero Draft for Management Effectiveness Evaluation of Elephant Reserves.

- A three days Orientation workshop for the Mahouts was conducted from 3-5 December, 2022 at Dudhwa Tiger Reserve, Uttar Pradesh.

- Organized the capacity building workshop on minimizing Railway – induced Elephant mortalities for the officials of Indian Railways during 1-3 February, 2023 at Wildlife Institute of India, Dehradun.

- Organized a capacity building workshop for Elephant Reserve managers during 13-15 March, 2023 at Wildlife Institute of India, Dehradun.

- A capacity building workshop on "Minimizing the impact of railways on elephants and other wildlife for the officials of Indian railways" was held during 23-25 November, 2023.

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- On 28-29 November, 2023, a two days workshop on

"Mainstreaming management of the Elephant Reserves" was held at Dehradun. The aforesaid workshop aimed to bring together all the Elephant Reserve Managers to deliberate on topics, relevant to elephant conservation and management including aspects of human-elephant conflict across the Elephant Reserves.

Sijoy Dutta

Date: 29/01/2024 **Deponent**

VERIFICATION

I, the deponent named above do hereby verify that the contents of paragraph 1 to 6 are true to my knowledge, based on the office records. No part of it is false and nothing material has been concealed.

Sijoy Dutta

Date: 29/01/2024 **Deponent**

S. CHAUDHURI
★NOTARY★
GOVT. OF INDIA
Regd. No.-6584/08
Bidhannagar Court
Dist.-North 24 Pgs.

29 JAN 2024

भारत सरकार/GOVERNMENT OF INDIA
रेल मंत्रालय/MINISTRY OF RAILWAYS
रेलवे बोर्ड/RAILWAY BOARD

No.2007/TT-IV/9/8 New Delhi, dated 30.03.2010

The General Manager,
N.F. Railway/Guwahati,
East Coast Railway/Bhubaneshwar
and Southern Railway/Chennai

NOTARY 6594/2008

Sub: General Advisories to prevent train accidents involving Elephants.

****

In the meeting held on 4.9.2009 under the chairmanship of Hon'ble Minister of State (I/C), Environment and Forests regarding death of elephants in train accidents, it was desired that Board and Ministry of Environment and Forests should work out the advisory of general nature to prevent elephant's death in train accidents.

Accordingly, general advisories received from Ministry of Environment and Forests have been considered in consultation with MOEF and concerned directorates in Board's office. The general advisory as approved by MOEF and concerned directorates in Board's office is attached herewith for necessary action.

(I. Jeyakumar)
Joint Director Traffic Trans.(POL)
Railway Board

DA: As Above

Copy to:

Shri A. N. Prasad, IG of Forests & Director (Project Elephant),
Ministry of Environment and Forests,
Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi- 110003

OSD(ME), Adv.(Safety), Adv.(M&L), EDCE(P), ED/Chg. and EDTT(S), Railway Board

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Genaral Advisories to prevent Train accidents involving Elephants.
(Jointly issued by MoR & MoE&F)

1. Clearance of Vegetation on the sides of Railway track
Zonal Railways will identify in consultation with Forest department *the vulnerable areas and will arrange need based cleaning of vegetation on the sides of Railway track within Railway land.*

2. Underpasses/overpasses across the Railway track to allow elephants to escape.
MoE&F will provide a list of selected locations for underpasses/overpasses. The cost will be borne by the MoE&F and the work will be executed by Railways on deposit terms.

3. Signage boards to pre-warn the Train Drivers.
Signage boards will be provided by Railways on both sides of the track in identified locations to pre-warn the train drivers.

4. Sensitising programmes for Train drivers/Guards/Station Masters
The Train Drivers/Guards/Station Masters will be sensitized on wild life conservation/Protection during Periodical Refresher courses at nominated Zonal Railway Training Centres.The required training materials will be provided by MoE&F.Also MoE&F may depute staff for special lecture on wild life conservation. Railway Board will furnish the list of such zonal institutes to MoEF.

5. Engagement of Elephant trackers by MoE&F and communication with Station Masters.
MoEF will engage elephant trackers equipped with mobile phone/walkies to receive/pass on information regarding presence of elephant herds around track length.

Separate wireless communication facility will be provided at the stations falling within the vulnerable areas identified by the MoE&F. On receipt of information, SM will give "Look out advice" to the train crew verbally or otherwise. The advice will be initially for two hours only unless or otherwise extended. Moreover the length of the section should be within 2 km.

6. To keep Railway track free from food waste that attracts elephants.

Railways will advise IRCTC/pantry car staff not to throw the edible waste in the vulnerable area. Announcement will be made at the stations located near vulnerable locations advising the passengers not to throw food waste.

* * * * *

ANNEXURE-II (9)

Government of India

Guidelines for Human–Elephant Conflict Mitigation

Taking a Harmonious-Coexistence Approach

Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhavan, Jor Bagh Road, New Delhi - 110 003, INDIA
Website: www.moef.gov.in

Acknowledgments

The Ministry of Environment, Forest and Climate Change, Government of India gratefully acknowledges the contributions of the experts and field practitioners who developed the guidelines, with support from innumerable contributors, using a participatory approach in workshops and consultations organised under the Indo-German Project on Human–Wildlife Conflict Mitigation in India.

The Ministry acknowledges the technical support extended by *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), in the preparation and pilot implementation of these guidelines.

The Ministry acknowledges the support provided by the Wildlife Institute of India and the state forest departments of Karnataka, Uttarakhand and West Bengal for pilot implementation of the key elements of the guidelines during 2018– 22 and the valuable feedback provided by them for updating the drafts.

Ministry of Environment, Forest and Climate Change

Government of India

Guidelines for Human–Elephant Conflict Mitigation

Taking a Harmonious-Coexistence Approach

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Abbreviations

BMZ	German Federal Ministry for Economic Cooperation and Development
CCTV	Closed-circuit television
CWLW	Chief Wildlife Warden
CZA	Central Zoo Authority
DBT	Direct Benefit Transfer
DFO	Divisional Forest Officer
DLCC	District-Level Coordination Committee
EDC	Eco-development Committee
EIA	Environmental impact assessment
EWRR	Early Warning and Rapid Response
GIS	Geographical information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
HEC	Human–Elephant conflict
HOFF	Head of Forest Force (in a state)
HWC	Human–wildlife conflict
HWC-MAP	Human–Wildlife Conflict Management Action Plan
HWC-NAP	National Human–Wildlife Conflict Mitigation Strategy and Action Plan
HWC-SAP	State-Level HWC Mitigation Strategy and Action Plan
IFS	Indian Forest Service
IUCN	International Union for Conservation of Nature
JFM	Joint Forest Management
MoEF&CC	Ministry of Environment, Forest and Climate Change, Government of India
NDRF	National Disaster Response Force
NGO	Non-governmental organisation
NTCA	National Tiger Conservation Authority
NTG	National Technical Group
NWAP	National Wildlife Action Plan
OPs	Operating procedures
PA	Protected area
PCCF	Principal Chief Conservator of Forest
PPE	Personal protective equipment
PRT	Primary Response Team
RFID	Radio frequency identification
RRT	Rapid Response Team
SDRF	State Disaster Response Force
SFD	State forest department
SHG	Self-help group
SLCC	State-Level Coordination Committee
SOPs	Standard operating procedures
WII	Wildlife Institute of India
WLPA	Wild Life (Protection) Act, 1972

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1. ABOUT THE GUIDELINES

1.1 THE OVERALL CONTEXT

- The Guidelines on Human–Elephant Conflict (HEC) Mitigation get the overall context from the Wild Life (Protection) Act 1972, National Wildlife Action Plan (2017) [1], Human–Elephant Conflict Guidelines (2017), Advisory to deal with human wildlife conflicts (MoEFCC 2021) and National Human–Wildlife Conflict Mitigation Strategy and Action Plan (HWC-NAP) [2]. HWC-NAP provides the overall conceptual and institutional framework for implementing the guidelines.
- This document takes into consideration the existing guidelines,[3] advisories and good practices on HEC mitigation [4] issued by Project Elephant and various state forest departments and builds on them to bring about a more holistic approach to HEC mitigation.

1.2 PURPOSE AND SCOPE

- These guidelines aim to facilitate a common understanding among key stakeholders on what constitutes effective and efficient mitigation of HEC in India, leading to co-existence, and to ensure standardisation in performing mitigation operations in the most effective and efficient manner, with minimum damage to humans and Elephants.
- These guidelines provide advice on mitigation measures to address HEC in the long term, as well as facilitate the development, assessment, customisation and evaluation of site-specific HEC mitigation measures that are effective and wildlife-friendly.
- These guidelines serve as a basis for overall long-term planning and coordination of HEC mitigation measures at the national, state and division levels.
- In general, these guidelines apply to all stakeholders involved in HEC mitigation and are not only limited to state forest departments (SFDs).

1.3 APPROACH

- The development and implementation of these guidelines is driven by a harmonious-coexistence[5] approach to ensure that both humans and Elephants are protected from the negative impacts of HEC.
- The guidelines address the issue of HEC, adopting a holistic approach. The holistic approach of the guidelines entails not only addressing the emergency situations arising due to immediate conflict situations but also addressing the drivers and pressures that lead to HEC; providing guidance on establishing and managing prevention methods; and reducing the impact of the conflict on both humans and Elephants.
- The development of these guidelines and the intended implementation are driven by a participatory approach. These guidelines are intended to facilitate participatory planning, development and implementation of HEC mitigation measures with key sectors and stakeholders at national, state and local levels.
- The guidelines reflect on the need for a landscape approach while formulating measures for mitigating HEC to ensure sustainable solutions as unless comprehensive and integrated HEC mitigation measures are implemented across the landscape, the problem is likely to only shift from one place to another.
- Efforts have been made to forge linkages with plans and guidelines of key relevant sectors for enhancing synergies and eliminating trade-offs at the field level.
- Taking a capacity development approach, the guidelines facilitate the implementation through provision of *Implementer's Toolkit*, which includes operating procedures (OPs), formats, checklists and other field implementation aids.

1.4 LEGAL AND POLICY FRAMEWORK FOR IMPLEMENTING THE GUIDELINES

- These guidelines should be read in conjunction with the existing relevant legal and regulatory frameworks, especially the Wild Life (Protection) Act 1972.
- The following laws are considered directly relevant for conservation when dealing with HEC:
  - Wild Life (Protection) Act,1972
  - Prevention of Cruelty to Animals Act, 1960
- Sections 9, 11(1)(a) (2) (3), 12(bb), 29, 35(6) and 39(1)(a) of the WLPA 1972 are especially relevant when dealing with HEC.
- The Supplementary Framework to HWC-NAP on Legislative Framework [6] for HWC Mitigation in India is to be referred to for more details on the specific legal provisions related to HWC mitigation.
- Other important legislations that facilitate conservation when dealing with HEC include the Environment Protection Act, 1986; Indian Penal Code, 1860; Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Electricity Act, 2003; Railways Act, 1989; National Highways Act, 1956; and Disaster Management Act, 2005.

1.5 INSTITUTIONAL MECHANISM FOR IMPLEMENTATION OF THESE GUIDELINES

- The institutional mechanism outlined in HWC-NAP will be followed for implementing these guidelines.

1 MoEFCC (2017). National Wildlife Action Plan (2017-35)

2 National HWC Mitigation Strategy and Action Plan of India (2021-26), available from https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf

3 MoEFCC (2008). Guidelines for care and management of captive elephants. 8 January 2008. Project Elephant Division, Ministry of Environment, Forests and Climate Change, New Delhi.http://moef.gov.in/division/forest-divisions-2/project-elephant-pe/new-guidelines/
MoEFCC (2017). Guidelines for Management of HECs. 2017. Project Elephant Division, Ministry of Environment, Forests and Climate Change, New Delhi. http://moef.gov.in/wp-content/uploads/2019/08/01-HEC-guidelines.pdf
Standards/ Norms for Recognition of Elephant Rehabilitation/ Rescue Centres under Section 42 of Wildlife Protection Act, 1972 (F.No. 2-5/ 2006-PE [Vol. II], Government of India, Ministry of Environment, Forest and Climate Change, Project Elephant Division. 29 Sept 2017.<http://moef.gov.in/wp-content/uploads/2019/08/02-Standards-Norms-for-Elephant-Rehab.-2_compressed.pdf>

4 MoEFCC (2020). Best Practices of HEC Management in India. 2020. Project Elephant Division, Ministry of Environment, Forests and Climate Change, New Delhi. http://moef.gov.in/wp-content/uploads/2020/08/Best-Practice-Man-Animal-Conflict.pdf

5 'Harmonious coexistence' is defined as a dynamic but sustainable state in which humans and wildlife adapt to living in shared landscapes, with minimum negative impacts of human-wildlife interaction on humans or on their resources and on the wildlife or on their habitats. The mitigation measures designed using this approach maintain a balance between the welfare of animals and that of humans in which both are given equal importance. Overlap in space and resource use is managed in a manner that minimises conflict.

6 Supplementary frameworks to the HWC-NAP: https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf

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2. CONTEXT AND SITUATION

- The Indian Elephant *(Elephas maximus)* is a keystone species affecting habitats and ecosystems in significant ways, ensuring ecological balance and resulting ecosystem services for human well-being. Elephants are referred to as ecosystem engineers due to their transformative role in the ecosystems where they create water holes that are also used by other wildlife for their survival during dry season, clear understories to promote new plant growth in forests, and facilitate seed dispersal of several important tree species, due to their highly mobile nature.
- The Elephant is recognised as a National Heritage animal and is deeply rooted in our culture. India holds by far the largest number of wild Asian Elephants, estimated at about 29,964 [7], this is nearly 60% of the population of the species. The Elephant is placed under Schedule I and Part I of the Indian Wild Life Protection Act (1972), which confers it the highest level of protection. However, Elephants and humans are now often in conflict in our country because of varied reasons.
- HEC refers to the negative interaction between humans and Elephants, leading to adverse impacts such as injury or loss of human lives, crop, livestock and other properties, or even their emotional well-being, and equally negative impacts on the Elephant or its habitats.
- The general drivers of HEC include a human population increase, changing lifestyle and economic aspirations, reduced appreciation of wildlife, climate change, disasters, land use change, policies in linear infrastructure, mining, urban development, habitat fragmentation, loss and degradation including local overabundance of Elephants. Among these, the increase in human population, land use change, changing lifestyle and economic aspirations, policies in linear infrastructure, mining, habitat fragmentation, loss and degradation have the greatest impact.
- The intensity of HEC is highly variable, ranging from very occasional to chronic, and depends on the density of Elephant populations; the nature of the interface between human areas and Elephant habitats; an irregular and diffuse boundary with a long perimeter; highly fragmented Elephant habitats interspersed with human-use areas; dispersing herds; railway tracks passing through forests with sizeable Elephant populations; etc.
- HEC is prevalent in many states and is particularly high, relative to the number of Elephants involved, in areas where Elephants have dispersed and areas that Elephants have colonised. It is estimated that approximately 500 persons and more than 100 Elephants are killed annually. Nearly 0.8 to 1 million ha of agriculture land may be impacted by crop damage due to Elephants, and nearly a million families are adversely affected due to HEC. The challenge extends to the transboundary Elephant populations of Bhutan, Nepal and Bangladesh.
- HEC mitigation so far has largely focused on the use of barriers, short-distance drives, and ex gratia payments or compensation for loss and damages. While these efforts have helped contain HEC, the problem continues to grow as a holistic approach has not been incorporated into the mitigation effort.

7 MoEFCC (2017). Synchronized Elephant Population Estimation India 2017. Project Elephant Division, Ministry of Environment, Forests and Climate Change, New Delhi

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3. AADDRESSING THE DRIVERS AND PRESSURES OF HEC

3.1 OVERVIEW

A major gap involves effective problem analysis to identify drivers and pressures of conflict which would allow appropriate selection of mitigation measures.

- An assessment of long-term outcomes and implications of all mitigation methods is needed to identify effective and Elephant -friendly mitigation measures to address HEC. For this, a systematic analysis of HEC mitigation methods should be done to assess their effectiveness and wildlife-friendliness in different types of conflict situations.
- This will facilitate the necessary customisation and adaption of the mitigation measures/combining two mitigation measures to achieve the best possible impacts in the field.

The HWC-NAP recommends a holistic approach to HWC mitigation by considering and addressing the thematic triangle of drivers–prevention–damage mitigation, these guidelines are prepared in line with the recommended holistic approach to bridge the current gap.

- The need to identify Elephant range areas and corridors in a state is the first step. Thereafter, in and around all such areas the drivers as aforementioned should be identified and addressing these drivers should be a priority in the state-level planning in order to avoid future impacts. Similarly, at the district-level planning, the impact of these drivers to be ascertained to avoid escalating HEC in the area.

Addressing the drivers and pressures includes responses that are directed towards:

- Management-relevant response for addressing the drivers and pressures
- Institutional capacity development for addressing the drivers and pressures

3.2 MANAGEMENT-RELEVANT RESPONSE FOR ADDRESSING THE DRIVERS AND PRESSURES

3.2.1 ZONATION IN ELEPHANT RESERVES

- The current land use and land cover and inherited land use changes have caused Elephant habitats to become habitat islands of various sizes within a sea of human-use areas, thus creating areas where Elephants and humans compete for space and resources inside Elephant reserves.
- Elephants, because of their adaptability, have also exploited opportunities to occupy plantation crops such as tea and coffee and thus overlap with humans in human use areas. Elephants have also adapted to fragmented landscapes by transiting through human-use areas to use spatially separated habitat patches. Some have adapted to using small habitat patches, a few hectares in extent, as daytime refuges to forage on the agricultural crops in the surrounding areas at night.
- All these factors have created different types of conflict situations between humans and Elephants; such situations have varying degrees of management feasibility, viz, sometimes these are easily manageable, sometimes situations require significant intervention and sometimes there are situations where keeping Elephants in unviable habitat patches is not possible for various reasons.
- Zonation, a management entity, takes into consideration the fact that resources available are limited and if these are not prioritised and optimally used, the conflict will intensify and the overall conservation benefits will be minimised. Zonation will allow a science-based and pragmatic approach to landscape level planning for conservation and HEC mitigation. Zonation should be based on Elephant population viability analysis in each prescribed zone. The zonation suggested in these guidelines reinforces the recommendations made by the Karnataka Elephant Task Force (appointed by the Karnataka High Court) and can be as follows:
  - **Elephant Conservation Zones**, where primarily Elephant conservation takes priority over competing livelihood goals (a smaller sub-section of our forests where human presence and resource extraction are absent): Areas where there is adequate habitat to support a viable Elephant population with no human settlements, and communities have no rights or dependencies on the forest. If any minor dependencies exist along the interface area, they should be such that they can be easily settled through negotiations.
  - **Elephant–Human Coexistence Zones**, where Elephant conservation and human livelihoods have to be balanced and reconciled (which would constitute the bulk of the forests): Areas where there is adequate habitat to support a viable elephant population where the movement of the Elephants is restricted to the interface area. There may or may not be human settlements inside the

forest, but communities have rights to resource extraction from the forests. The extraction of resources from the forests should be sustainable so that it does not degrade the Elephant habitat and escalate HEC.

- **Elephant Exclusion Zones**, areas where Elephants do not have adequate natural habitats and are dependent on crops for survival, and hence effective conflict mitigation would not allow Elephants to survive in such areas. In such areas concerns of human safety and livelihood take precedence over competing conservation concerns about Elephants, as Elephant populations in such areas may not be viable in the long term. Elephants in such areas need to be translocated, and after translocation, further colonisation of such areas should be stopped through proper HEC mitigation strategies.

3.2.2 MONITORING AND MANAGING HABITAT-RELATED DRIVERS AND PRESSURES

- There is a clear need to have a more holistic understanding of HEC and its implications for humans and Elephants. Monitoring and addressing habitat loss, fragmentation and degradation may play an important role in understanding and mitigating HEC. Therefore, the following measures should be envisaged:
- Mapping of existing drivers and pressures of conflict such as linear infrastructure, mining, encroachments, settlements within forests, and resource use by local communities.
- Ensuring that all forest boundaries are clearly demarcated and patrolled on regular basis including monitoring deemed forest areas, forests on revenue land and private forest areas that form part of the Elephant range.
- Managing Elephant habitats in regions where the bulk of the forests are under the management of district councils and local bodies (where the SFDs have restricted control) requires active participation of communities and proper land use planning by:
  - Mapping the Elephant distribution and numbers in community forest areas with a population and habitat viability analysis to determine where and what can be conserved
  - Mapping land tenure and identification of communities who are stakeholders in the land
  - Consultation with local communities to facilitate Elephant conservation
  - Engaging various line departments who can facilitate in enhancing or improving livelihood options that reduce the extent and intensity of slash and burn agriculture and thus bring about Elephant-compatible land use
  - Facilitating capacity development of the forest department, line departments, local communities and all key stakeholders
  - Preparing, implementing and periodically updating long-term perspective plans such as state-level human–wildlife conflict mitigation strategies and action plans (HWC-SAP) and division-level HWC management action plans. A common framework for developing these plans is provided in the supplementary frameworks to the HWC-NAP [8].
- Developing synergies and facilitating integrated land-use planning for effective implementation of planned measures, through the State-level Coordination Committees (SLCC), Multi-stakeholder Fora at the state level, Joint Working Groups with key departments and agencies at the landscape level, and the District-level Coordination Committees (DLCC).
- Developing innovative firefighting strategies and equipment, using RS technology, etc. and engaging the local community, especially the community-level Primary Response Teams (Community PRTs).
- Facilitating long-term studies to understand the impact of these measures in addressing the drivers in the landscapes

3.2.3 HABITAT RESTORATION AND RECLAMATION OF DIVERTED FOREST LAND

- Habitat restoration requires that the driver of habitat degradation be first addressed so that the process of degradation does not continue. The following measures are envisaged:
- SFDs should prioritise restoration in and around vulnerable areas and HWC hotspots.
- In highly degraded habitats the process of regeneration may be accelerated by interventions such as gap planting with native species, controlling soil erosion, ground water recharging, restoring grasslands and tree cover, etc.
- Many Elephant ranges have large monoculture plantations. They may not be optimal habitats for wildlife, and therefore the native vegetation needs to be restored by preparing ecologically sound plans in the interest of habitat improvement and HEC mitigation.

8 Supplementary frameworks to the HWC-NAP https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf

- SFDs may work with mining project proponents to reclaim and restore old mining sites.
- In many regions across India, tea, coffee, rubber and cardamom estates within Elephant landscapes are unutilised; such areas can be restored/reclaimed for Elephant conservation.

3.2.4 REMOVAL OF INVASIVE PLANT SPECIES IN AND AROUND HEC HOTSPOTS INCLUDING VISTA CLEARANCE

There may be suppression and reduction of indigenous plants due to the presence of invasive alien species in the area resulting in decreased habitat quality, leading to increased movement of Elephants outside the forested landscapes, subsequently leading to increased HEC. The following measures may be implemented:

- Mapping invasive species cover and abundance in the landscape and the herbivore use of the landscape and accordingly implementing habitat management plans.
- Exploring the use of remote sensing data for mapping and managing invasive species.
- Prioritising sites for intervention based on hotspots of invasive species spread, areas critical for the Elephant (and other herbivores) and conflict hotspots, to ensure efficient mitigation, given the scale of the problem, and the challenges involved in containing and eliminating invasive species over large landscapes.
- Clearing vistas along the boundaries of forests in close proximity of the habitations for avoiding accidental encounters.
- SFDs may facilitate Panchayats in making the HEC hotspots adequately lit, by installing street/solar lights.

3.2.5 SECURING ELEPHANT CORRIDORS

Elephants have large home ranges, often with clear seasonal ranges and migration paths and fragmentation or blockage in their movement path will result in disruption causing conflict. In the document titled "Right of Passage – Elephant Corridors in India", 101 corridors have been listed; however, there are likely to be additional corridors that need to be identified.

Hence, SFDs may start planning corridor conservation by taking into consideration the following:

- Initiate landscape level assessment of all constrictions in habitat and obstructions caused by linear infrastructure, using GIS and remote sensing tools to identify any new corridors. This should be supported by verification on the ground using the field staff.
- Corridor management strategies should be developed and incorporated into the working/management plans and into the HWC Management Action Plans at division levels.
- Threats to the physical integrity (land use changes) of the corridor and to the free movement of Elephants (disturbances, degradation, etc) within the corridor should be identified and addressed.
- Corridors through tea/coffee estates which connect two or more large habitat patches should be secured.
- Restoration of habitats within the corridors, where possible, should be carried out.
- Support should be provided to PRTs and RRTs during the migration season.
- The feasibility of establishing community reserve or private conservancies should also be explored, with greater participation from community-based institutions and key stakeholders.
- In the case of private lands, the villagers may be incentivised to allow movement of Elephants.
- Awareness about Elephant ecology, behaviour and suitable mitigation measures to humans living in and around the corridor areas may be imparted, regularly.
- Address the issues of land tenure and land use in the corridor and existing linear infrastructure within the corridor area in order to secure its legal status and physical integrity.

3.2.6 REDUCE LIVELIHOOD DEPENDENCE OF HUMANS ON FORESTS

Communities living in proximity to the forest are dependent on forest biomass (fuel wood, NTFP, livestock grazing, etc), which is the primary reason for them to enter the forest. Accidental encounters of humans with Elephants inside forest areas can be prevented to a large extent by reducing the dependence of humans on forests. The following indicative measures may be implemented:

- Facilitate management interventions for better livelihood opportunities through community-participatory approaches including various eco-development measures and livelihood improvement programmes.
- Reduce the dependency of fringe forest communities on forests (e.g., cattle grazing, fodder collection, fuelwood collection, non-timber forest produce (NTFP) collection, right of way) by participatory forest management.
- Improve animal husbandry practices (promoting stall-feeding practices or incentivising improved livestock breeds)
- Address livelihood needs of communities by skill development, poverty alleviation and alternate income generation schemes of the government.

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- Facilitate cross-sector linkages for community development (coordination and cooperation with line departments).
- Facilitate cooperation to integrate HWC mitigation planning at the district level, through measures including, but not limited to, dovetailing HWC mitigation measures with schemes relevant to community development.

3.2.7 SCIENTIFIC POPULATION MANAGEMENT AT INTERFACE AREAS OR CONFLICT HOTSPOTS

A local overabundance [9] of wildlife including Elephants could be due to various factors including habitat loss, degradation and fragmentation, and an increase in population. The Elephant population in fringe forest areas have become habituated to humans and therefore there may be a proper understanding of the spatio-temporal distribution, foraging and ranging patterns and use of human-dominated landscape. The following measures are envisaged:

- Implementation of a robust population monitoring protocol at HEC hotspots, using trained field staff or in collaboration with research institutes or local universities/colleges.
- The dispersing Elephant population that has colonised new areas may be assessed for impacts on the well-being of the people and the Elephants.
- Understand the population dynamics of Elephant herds in the tea estates and coffee plantations, which continue to remain there as resident populations, and changes in their behavioural attributes.

3.2.8 MANAGING TRANSBOUNDARY AND INTERSTATE ELEPHANT MOVEMENT

- Some Elephant populations are known to regularly cross international and state boundaries. This occurs regularly on the international boundary with Nepal, Bangladesh, Bhutan and Myanmar. Elephant populations regularly cross interstate boundaries in many Elephant states such as Goa, Maharashtra, Northern Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Himachal Pradesh, Haryana, Manipur and Mizoram and within southern states. The following measures are envisaged:
- Within India, states sharing the Elephant landscape should meet at least annually and share information and plan for management of Elephants under the aegis of the National HWC Mitigation Forum using a common framework/approach to implement a coordinated strategy.
- As to the transnational management and conservation of Elephants between neighbouring countries, the states sharing international boundaries should follow the protocol as agreed between the nations and communicated by the MoEF&CC.

3.2.9 EFFECTIVE GARBAGE MANAGEMENT AND SAFE SANITATION AROUND ELEPHANT HABITATS

Garbage is known to attract Elephants, and when garbage dumps are on the periphery or inside a village/town they create potential for accidental encounters between humans and Elephants. Unmanaged garbage may also habituate Elephants to moving and foraging in human-use areas, and as a consequence there may be high levels of conflict.

The vegetable and food waste generated in weekly markets in rural India and garbage thrown along roads and railway lines passing through forests attract Elephants. With a large number of humans moving around on foot or on two-wheelers, particularly in the evening after the rural markets, and Elephants also moving into the same area in the evening, accidental encounters happen. Accidental encounters also take place when truck drivers pass through forests, and also when they (truck drivers), and local people go into the forest for defecation, especially at dawn and dusk.

9 Local overabundance refers to occurrence, in a habitat, excessive number of individuals of a species beyond the normal population density, due to a variety of factors.

The following are indicative measures to address the situation:

- Ensure sustainable and ecologically sound waste- and garbage disposal by town municipalities and village panchayats bordering Elephant habitats
- Undertake periodic inspection of the forest perimeter near villages/towns to ensure that poor disposal of waste and garbage is detected early and brought to the notice of relevant local authorities. Volunteers can be engaged for this.
- Aversion conditioning measures may be implemented, in areas where Elephants have started foraging inside the boundary of villages and towns in search of forage and have grown accustomed to feeding on garbage.
- Community awareness including signages etc should be implemented to facilitate effective participation from local communities in garbage management.
- SFDs may also coordinate with municipalities/ panchayats on garbage management and explore the possibility of building toilets under the Swachh Bharat Mission to prevent accidental encounters at HEC hotspots.

3.3 INSTITUTIONAL CAPACITY DEVELOPMENT FOR ADDRESSING THE DRIVERS AND PRESSURES

3.3.1 STRENGTHENING THE ROLE OF KEY STAKEHOLDERS

Local communities bear the direct brunt of loss of crops and human lives and other economic losses as a direct or indirect result of HEC. This has a direct impact on the wildlife and its habitat. The long-term engagement with local communities and other key stakeholders can be institutionalised and continued by adopting the following measures:

- Facilitate the establishment and effective steering of State-Level Coordination Committees (SLCC), a landscape-level multi-stakeholder forum, and District-Level Coordination Committees (DLCCs) to strengthen the inter-agency and cross-sector coordination and engagement of key stakeholders required for HEC.
- SFDs may support the community-level (village/ward) Primary Response Teams (PRTs) as the entry point for all community engagement work. Establishment and developing the capacity of PRTs should be in line with the Supplementary Framework to HWC-NAP on Establishment and Capacity Development of HWC Mitigation Response Teams.
- Establish a platform where all community members, people's representatives and government agencies can interact and find solutions to mitigate conflict.
- Briefing of forest user groups, workers of tea and coffee plantations before every work season about Elephant risk and safety issues
- A campaign for creating awareness of Elephant may be instituted and communities also need to be educated to take responsibility in managing 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
- Plan and implement training programmes and other capacity development measures, extension programmes with school and college students, engage with women's self-help groups, Village Forest Committees (VFCs), Eco-development Committees (EDCs), Large Area Multipurpose Society (LAMPs), forest user groups, etc The EDCs/VFCs formed by the SFD in villages abutting the forest area in the periphery and zone of influence may be made functional and their sustainability ensured by accrual of benefits and incentives.
- Carrying capacity studies may be conducted to assess the tourism potential in the HEC hotspots.
- HEC mitigation measures should be developed with an inclusive and participatory approach.
- Ensure the participation of key stakeholders to ensure integration of traditional and local knowledge and experiences into the development of division-level HWC Management Action Plans (HWC-MAPs).

Tools for stakeholder engagement may be developed.

3.3.2 COMMUNITY AWARENESS AND COMMUNICATION MEASURES TO REDUCE THE RISK OF ACCIDENTAL ENCOUNTERS AND RETALIATION

Encounters with Elephants often take place in low light conditions, early in the morning or late in the evening, or when people enter the forests for NTFP or firewood collection, or Elephants enter the crop fields or get attracted by country liquor stored in houses. Knowledge of these factors can help prevent such encounters.

To facilitate effective engagement of local communities and various stakeholders in mitigation of HEC, it is extremely important to plan and implement awareness and sensitisations measures, taking a participatory approach.

- Appropriate community awareness and communication measures may be implemented at HEC hotspots, and their impacts may be assessed periodically to ensure that the awareness and communication measures are locally customised.
- The local communities at HEC hotspots may be advised to store grains in the granaries in pucca or underground structures. If necessary, communal granaries can be opted for.
- The local communities at HEC hotspots may be advised to avoid brewing indigenous liquor, which attracts wild Elephants to villages. Appropriate measures may be devised, together with the local administration, to implement this measure.
- Tools for developing, implementing and customising community awareness and communication measures may be developed.

3.3.3 SYSTEMATIC RESEARCH AND MONITORING ADDRESSING HEC

HEC mitigation is a challenging issue, especially when adequate data on Elephant population density, Elephant demography, social and ranging behaviour of Elephants and its ecology are not available. Currently the data for assessing the impact of HEC are limited to the number of compensation claims paid, number of humans killed or injured, and the number of Elephants killed. There is, therefore, a need to constantly develop a knowledge base of subjects such as habitat usage, habitat connectivity, corridors, preferred or suitable habitat, home range, behaviour, attractions along the habitat and their movement paths.

Therefore, the following research topics are prioritised, which are expected to answer the existing management questions:

- Data on indirect costs of HEC (for example, abandoning agriculture due to HEC or human well-being, including stress, fear and restrictions on normal daily activities) may be gathered.
- Recording and analysing the data on long-term adverse impacts of HEC on Elephants (in terms of stress, reduction in reproductive fitness, loss of genetic diversity, etc.) and socio-economic impacts on families and communities may be done.
- SFDs may involve research institutions, non-governmental organisations (NGOs) and experts in carrying out result-oriented research on HEC status and mitigation measures besides undertaking in-house research.
- A standardised criterion for assessing the effectiveness and wildlife-friendliness of mitigation measures should be developed and used.
- The following research areas may be given higher priority for research and monitoring at HEC hotspots and the results from such studies may be consolidated at the national level to support further revision of these guidelines and strengthen the HEC mitigation measures:
  - Elephant responses to land use changes (mining, linear infrastructure) inside the forest
  - Elephant responses to changing cropping patterns and land use changes outside the forest
  - Differences between crop-foraging and non-crop foraging Elephants to understand what factors influence crop foraging behaviour
  - Status of Elephant populations along with demographic parameters
  - Impact of local overabundance on the habitat, population and HEC and impacts on other species
  - Efficacy of HWC mitigation tools and Elephants' responses to different methods (RRT/PRT interventions, barriers/deterrents, habitat interventions, etc)
  - How different mitigation measures impact Elephants (change in resource use, health and HEC)
  - Monitoring the efficacy of community capacity building exercises and how the threat perception has changed.

3.3.4 FACILITATING CAPACITY DEVELOPMENT MEASURES TO DEVELOP THE REQUIRED COMPETENCIES FOR ADDRESSING HEC IN THE MOST EFFECTIVE AND EFFICIENT MANNER

Facilitating capacity development of SFDs, other line departments, local communities and all key stakeholders to ensure that a holistic approach can be followed.

Training of the field staff and response teams

- The SFDs should ensure that all response team personnel from forest and other line departments and agencies are brought under a systematic approach to capacity development, in line with the *Supplementary Framework to HWC-NAP on Establishment and Capacity Development of HWC Mitigation Response Teams*[10]

10 Supplementary Framework to HWC-NAP on Establishment and Capacity Development of HWC Mitigation Response Teams available from https://moef.

- Arrangement for deployment of personnel and quick action on cognizance of conflict cases may be strengthened in each division
- The SFDs may sensitise all response teams and relevant personnel from forest and other line departments and agencies to the One Health approach, which can be used for planning and implementing measures related to occupational health and safety and humane treatment of animals in conflict.
- Regular and systematic training programes on critical operations such as rescue, capture and translocation should be conducted jointly with other key relevant departments, in the form of mock-drills and simulation trainings.
- Advanced trainings on animal welfare issues should be conducted for all personnel of the RRTs.
- Competencies of members of RRTs to be reviewed on a regular basis and the curriculum for their training to be fine-tuned and updated regularly, in line with the Supplementary Framework to HWC-NAP on Establishment and Capacity Development of HWC Mitigation Response Teams.
- The arrangement for deployment of personnel and quick action on cognizance of conflict cases may be strengthened in each division.

Training and support to *mahouts* and assistants

- SFDs may build the capacity of mahouts, incorporating learnings from Elephant behavioural studies for guiding *koonkie* Elephants in dealing with conflict mitigation.
- Trainings for mahouts from different states may be conducted, preferably in local languages, and developing trainers.
- States conducting regular trainings can act as regional hubs for imparting training to the other states in training the mahouts of *koonkie* Elephants.
- A database of experienced mahouts of *koonkie* Elephants may be developed and linked to the National HWC Mitigation Database.
- Steps may be envisaged for improving the service conditions of mahouts.

Training and support for daily wage workers/anti-poaching watchers

- SFDs may provide appropriate support and systematic training to daily wage workers and anti-poaching watchers on key HEC operations handled by them.
- Steps may be taken to improve their service conditions.

Support the local population in human safety by preventing accidental encounters with Elephants

- SFDs may facilitate, encourage and seek support from local NGOs, volunteers, schools, etc to implement safety measures, aiming at preventing human–Elephant encounters. These measures may include guiding people to watch for signs of Elephant presence during crepuscular period (around dawn and dusk), and how to respond when they encounter an Elephant. Regular trainings in local schools and colleges, and also possibly during village meetings at HEC hotspots, can be organised to train people on such safety measures.
- Tools for such safety measures may be elaborated.

3.3.5 MEASURES TO STRENGTHEN CROSS-SECTOR AND INTER-AGENCY COOPERATION FOR HEC MITIGATION

Cross-sectoral cooperation for HEC mitigation entails that multiple stakeholders from different sectors and domains be engaged, at national, state, landscape and district/forest division-levels. Key stakeholders for HEC mitigation may include State Forest Department, and other line departments, viz., Agriculture, Revenue, Animal Husbandry, Police, Public Works, Health and Family Welfare, Education, Electricity Boards; private sector (tea or coffee plantations), and agencies viz., Railways, National Highway Authority of India, as well as wildlife conservation and development NGOs, farmers' cooperatives and agricultural research institutions are relevant when dealing with conflict and conflict mitigation

Following measures are envisaged:

- State-level Coordination Committees (SLCC), landscape-level multi-stakeholder fora, and District-level Coordination Committees (DLCC), may be used to strengthen inter-agency coordination required for HEC, and district specific operational mechanism may be developed to address specific needs for HEC mitigation.

gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf

- Safety audits may be conducted each year, if feasible, to ensure that all members of the community act responsibly in case of HEC, and to facilitate inter-agency cooperation.
- Maintaining information and data on HEC cases with reference to the developments in the area that may have bearing on conflict cases, may be used for discussions in the DLCC.

3.3.6 MEASURES TO STRENGTHEN THE SYSTEM OF KNOWLEDGE MANAGEMENT ON HEC MITIGATION

To ensure effective and sustainable HEC mitigation measures, it is essential that field experiences, learnings, field-evidence and conceptual advances are not only shared across key stakeholders and landscapes, but such knowledge is also documented to be utilised for future strategies and plans on HEC mitigation.

- National HWC Mitigation Forum, Landscape-level multi-stakeholder forum, and appropriate Working Groups may be used to share field experiences, learnings, evidence and conceptual advances, within the forest department, across stakeholders, and across landscapes.
- Measures may be put in place to systematically document field experiences, learnings, field-evidence and conceptual advances on HEC mitigation, to inform the future strategies and plans on HEC mitigation.

4. DEPLOYING MEASURES TO PREVENT HUMAN–ELEPHANT CONFLICTS

4.1 DIFFERENTIAL MITIGATION APPROACH FOR DIFFERENT HEC LOCATION SCENARIOS

HEC can be effectively addressed by understanding the type of conflict, the site of occurrence, and its overall impact on humans and Elephants.

4.2 IDENTIFICATION OF HEC HOTSPOTS

"HWC Hotspots" are areas with actual or predicted repeated occurrence of HWC incidents resulting in crop-loss, livestock death, human death and injury, wildlife death and injury over temporal and spatial scales. It can be static (repeated in the same place or time) or dynamic (shift in space and time over years). In addition to count statistics, the magnitude of the incidents is subjected to interpolation or extrapolation techniques to define the hotspots in space and time.

Identifying conflict hotspots that could also provide a direction towards the drivers of conflict, is critical to provide site-specific solutions to mitigate human–Elephant conflict. Conflict hotspots of HEC can be mapped through geo-spatial assessments, by using both primary data and secondary data including time-series data. The hotspots can be identified and mapped as follows:

- **Incident hotspot:** Frequency of occurrence of incidences over past specific years such as previous five or ten years, mapped over the target area. The data include number of incident of injury and death, attack/ killing of domestic animals.
- **Vulnerability Hotspot:** Cumulative index by overlaying past incidents, vulnerability of local community and potential risk of the area.

The following assessment are envisaged:

- Database to be created by involving frontline SFD staff, researchers, research institutions, veterinary professionals and others for the identification and assessment of the hotspot.
- Predictive modelling based on the field data and Geographic Information System (GIS) analysis, may be carried out by trained personnel.

4.3 EFFECTIVE USE OF EARLY WARNING AND RAPID RESPONSE SYSTEM AT HEC HOTSPOTS

Since it is inevitable to prevent the wildlife and humans from using the same space in many situations, early warning systems and rapid response teams are important for timely action to prevent the conflicts and to reduce the impacts due to such incidents. However, with Elephants, some conflict situations require high intensity interventions.

A system of "Early Warning and Rapid Response (EWRR)" should be established and used to enhance the overall efficiency of mitigation efforts in the field. EWRR is a set of tools, processes and personnel competencies needed for the timely and meaningful generation and dissemination of alert information to individuals, communities and establishments at risk, for optimal preparedness and response and at the appropriate time to reduce the likelihood of injury, death or crop damage.

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EWRR would structurally include an HWC Mitigation Hub/ Control Room, and a system of three-tiered response teams, viz, Division-level Rapid Response teams (Division RRT), range-level Rapid Response Teams (Range RRT) and village/ward level Primary Response Teams of local community (Community PRT). The following steps should be taken up under the EWRR system, in line with the *Supplementary Framework to HWC-NAP on Establishment and Capacity development of HWC Mitigation response Teams*[11].

The system of early warning and rapid response can be used for detecting early conflict case with Elephants and for ensuring appropriate response in cases of HEC.

4.4 MONITOR AND DOCUMENT 'POTENTIAL ELEPHANTS-IN-CONFLICT' IN THE LANDSCAPE

Potential Elephant-in-conflict is/are individuals/ herds that are likely to enter in a HEC situation, owing to their movement pattern/ other behaviour.

Monitoring of potential Elephants-in-conflict in the forest-agriculture interface area can be carried out, as a preparedness and prevention measure, to ensure that their movement in the human-dominated landscape does not lead to an emergency situation. Following are some examples of such monitoring methods:

- Monitoring the movement of potential Elephants/ herds-in-conflict in the landscape, by recording direct observations, indirect evidence such as hoof prints and dung (to generate presence-absence data), and foraging signs in crop fields. Interviewing local villagers can reveal Elephant presence and movement patterns.
- Spatial and temporal movements, and behaviour of straying individuals from known Elephant herds monitored using camera traps and radio collars.
- Updates on the status of Elephants in potential conflict areas, especially on migration/ movement patterns, collected.
- SFDs may develop an identification database of identified individual and known herds of Elephants, their movement pattern within human-dominated landscapes, and the conflict that is thereby generated; this will help identify aggressive and individual Elephants with high potential for conflict

4.5 AN INTEGRATED APPROACH TO MANAGING POTENTIAL ELEPHANTS-IN-CONFLICT

There are three key elements in most HEC situations: the Elephant, humans (settlement) and the attractant for the Elephant (such a palatable crop). Sometimes removal of one of these elements in the conflict is required to resolve an intractable situation.

- Addressing high conflict Elephant/s: Male Elephants in particular are prone to higher levels of conflict and some of them become habituated to humans and the different methods they use to protect crop. The following measures are envisaged:
  - SFDs may develop an identification database of identified individual and known herds of Elephants, their movement pattern within human-dominated landscapes, and the conflict that is thereby generated; this will help identify aggressive and individual Elephants with high potential for conflict. SFDs should identify the high conflict individual/s from this database.
  - SFDs should test aversion conditioning to train habituated males who have the ability to breach barriers to avoid human use areas through radio collaring of such males so that systematic intervention is possible.
  - Necessary capture, translocation (if required) to be carried out as per the Guidelines and OP with related monitoring protocols. Translocation is one of the tools available for addressing high conflict individual or even pocketed populations. Animals which are captured may be rehabilitated in a suitable habitat or to be brought into captivity depending upon the situation.
- Addressing settlements inside the forest in HEC hotspots: When settlements inside the forests face very severe HEC and also have other problems based on the remoteness of their location, they may be willing to be resettled outside the forest in order to avoid HEC and to have access to a better livelihood and living conditions. In such situations the SFDs should facilitate voluntary resettlement, as per the protocols of the Government of India.
- Addressing the attractant for Elephants:
  - Identification of non-palatable crops by the farmers / agriculture department with due consideration to their socio-economic-cultural aspects

11 Supplementary frameworks to the HWC-NAP https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf

- The low economic return from non-palatable crop may be addressed by facilitating assured pricing mechanism, value addition and marketing linkages.

4.6 MANAGING DISPERSING ELEPHANTS

Elephants which have strayed out of the forest and have been driven back to their natural habitat and also Elephants which colonise new areas, pose a very significant challenge to the managers. The following measures may be envisaged:

- Such Elephants should be monitored based on individual identification and tracking through radio-telemetry.
- Population-habitat viability analysis should be conducted for long-term scientific population management and HEC mitigation.
- Evaluation of the outcome of past dispersals is necessary to determine the effectiveness of the mitigation measures.
- Ensure regular monitoring and review by the Chief Wild Life Warden of the situation in all potential HEC conflict hotspots.

4.7 JUDICIOUS USE OF BARRIERS, TAKING A LANDSCAPE APPROACH

Barriers are primarily used to regulate the movement of Elephants, and poorly designed barrier can have adverse impact on conservation. Barriers are not fool-proof, so there may be breaches and occasionally some Elephant may be able to overcome them and enter human use areas.

Following principal types of barriers are currently used to prevent Elephant entering human-dominated areas:

- Elephant Proof Trench (EPT)
- Solar powered electric fences
- Rubble walls
- Other types – railway girders / tracks, steel channels / ropes / bars etc

When planning and establishing barriers, following to be considered

- Adopting a landscape approach during planning and execution so as not to disrupt natural movement of the Elephants in the landscape. This may be applicable to the following situations
  - Construction of barriers around forest areas to keep Elephants inside the forest. Such barriers are not advisable around small forest blocks (few sq. km in size) because such forests cannot provide all the space and food requirements and confines the Elephant population, compromising their long-term genetic viability. It may be moderately useful around large forest blocks but extremely difficult to completely encircle forest blocks.
  - Barriers constructed across the landscape between two states / districts / countries. It is rather impossible to create effective barriers at landscape-level ensuring movement of the Elephants across ecological landscapes and not be confined to administrative units.
  - Barriers constructed around the settlement to be protected such as village / enclave. This would be most effective for protection of crops but it can be used only in specific situations wherever there is a compact area but not so around large enclaves.
- Creation of site-specific quality barriers using a participatory approach from designing monitoring and maintenance by systematic engagement of communities is essential.
- Barrier should only be used at the interface between human use areas and forests.
- Barriers with sharp spikes that have potential to injure Elephants, wildlife, livestock and humans should be avoided.
- When barriers are to be developed, a map should be prepared showing location of Elephant groups, seasonal migration patterns of Elephants and locations of Elephant corridors including location of proposed Elephant barriers.
- Barriers may be created only if the boundary is "hard" (clear and sharp demarcation between forest and human landscape), fairly straight without much convolution and not broken by roads, river or large stream for making them more effective.

4.8 JUDICIOUS USE OF OTHER EXCLUSIONARY MEASURES, TAKING A HARMONIOUS-COEXISTENCE APPROACH

Beating of drums or tin can, kerosene torch (mashal), swinging fireball and shouting are the most common repellent measures, but their effectiveness is low in most situations. The following measures may be envisaged:

- Innovative local repellent techniques like honey-bee boxes, chilly ropes etc may be piloted, and customised to enhance their effectiveness, while ensuring their wildlife-friendliness.
- New repellent methods may also include sound of bees and carnivores, use of drones etc besides deterrents like trip / sensor-based alarm system.
- Community-based institutions may be engaged by the SFDs together with wildlife experts / organisations, in motivating, training and hand-holding the community in use of exclusionary measures.

4.9 SUPPORT LOCAL POPULATION IN CROP-GUARDING METHODS

Guarding crops at night from any safe structure is one of the most effective early warning and deterrent method. Crop-guarding involves deterring Elephants by chasing and driving them using noise (i.e., shouting, beating drums or tins or using firecrackers/torches). Guarding crops at night is suitable in low-conflict areas. The following measures may be envisaged:

- Developing Community-based-conflict-management (CBCM) measures, especially in North Eastern Region, as a means of empowering the community to share the responsibility of HEC mitigation with the Forest Department through JFMC / EDC / Gram Sabha considering their vital stake and for eliciting more rapid response.
- Community PRTs and farmer groups may be engaged to ensure that besides preventive measures, traditional crop-guarding methods are encouraged, with the involvement of the local community/farmers.
- Awareness-building and training should be carried out on the proper usage of firecrackers and fire torches such that do not harm the Elephants, nor become fire hazards and on various aspects of the crop-guarding techniques.
- Early warning bulk SMS Alerts along with pulsating warning lights on towers, that warns of Elephant presence in the area may be developed.
- Farmers can be supported in developing effective and sustainable crop-guarding practices by various incentive mechanisms and subsidised funding under district-level government schemes such as Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).
- A compendium on good practices on crop guarding techniques may be developed for use by the local community.

4.10 ADDRESSING ZOONOTIC AND OTHER EMERGING DISEASES, ADOPTING A ONE HEALTH [12] APPROACH

The response teams and other stakeholders, at HWC hotspots, are vulnerable to a variety of Zoonotic disease that can be transmitted from different animals, apart from the risk that exists for disease transmission domestic animals and wildlife; and between human-domestic animals:

- Veterinary capacities and infrastructure may be upgraded, to facilitate disease monitoring in Elephant populations (e.g., for anthrax, rinderpest, foot-and-mouth disease), both from an Elephant conservation point of view, and from zoonotic diseases spreading to livestock and human populations.
- To reduce biotic pressure on forests and prevent the spread of zoonotic diseases, it is encouraged to keep high yielding cattle and stall-feed them
- A well formulated Wildlife Health Management and Disease Surveillance Plan may be developed at every division/Protected Area (PA).
- All personnel involved with capture operations may be trained, vaccinated and equipped.
- The basic approach should be to integrate the concept of 'One Health', which links human and animal health in a shared environment, into all the operations and HEC mitigation measures in the field.

12 One Health is a collaborative, multi-sectoral and trans-disciplinary approach—working at the local, regional, national and global levels—with the goal of achieving optimal health outcomes, recognising the interconnection between people, animals, plants and their shared environment.

5. ADDRESSING THE EMERGENCY SITUATIONS ARISING DUE TO HEC

Emergency or Crisis situations can be defined as situations that are sudden, unexpected, have the potential to be serious/are serious in nature and therefore require immediate intervention in time and space, from concerned stakeholders, to minimise loss of lives and assets. The response to such emergencies involves prompt handling of situations, ensuring reduced vulnerabilities of humans and Elephants.

An indicative list of the potential emergency situations on a priority basis is as follows:

i. A human is killed/injured
ii. Elephant/abandoned calves are injured and need rescue
iii. Property is damaged
iv. Elephant has entered human use areas (agriculture field or settlement areas)
v. Livestock is injured/ dead
vi. Elephant death due to retaliatory action by humans / train collision
vii. Crop damage
viii. Sighting of Elephant in the vicinity of agricultural land or settlement

Key response procedures should be established, and actions promptly implemented/ undertaken for addressing emergency situations. Detailed step-by-step guidance should be developed as "Operating Procedures for Addressing Emergency Response Situations"

The key emergency response procedures may be elaborated, and should include the following:

5.1 PREPAREDNESS MEASURES – BEFORE AN EMERGENCY SITUATION ARISES

5.1.1 ESTABLISHMENT OF EMERGENCY RESPONSE MECHANISM

A strong institutional mechanism is required, to respond to emergency situation arising due to HEC. This starts with detection of incident, communication to Control Room and information dissemination to the officials and staff in the command-and-control hierarchy, including forest and civil administration, for initiation of appropriate response actions. The divisional forest office coordinates action by rushing RRTs to the incident site. The field support operations to be structured around the following key operational stages, for synchronisation of activities to meet the emergency:

- Monitoring and situational awareness.
- Mitigation Hubs/Control Room/helplines to receive and disseminate information.
- RRT/ PRT personnel, veterinary team, drug and equipment, mobility and communication to address the emergency situation, effectively and efficiently.

5.1.2 INTRA- AND INTER-AGENCY COORDINATION AND COOPERATION

- Procedures may be laid down in each forest division/ district, in line with these guidelines, and in line with the institutional framework suggested under the HWC-NAP, to ensure timely coordination amongst the various response teams from forest department and other agencies, under the DLCC consisting of District Magistrate/District Collector; Police, Fire Services, Animal Husbandry Department, Health Department, SDRF, NDRF, Paramilitary Forces, etc and local community, especially local Panchayat leaders and village Community PRTs.

5.1.3 PREPAREDNESS OF RESPONSE TEAMS

- Operating Procedures may be laid down in detail to ensure that the capacities and capabilities of the various response teams (Community PRTs, RRTs) are established and facilitated in their capacity development through trainings and other measures, including trainings on occupational health and safety.
- Operating Procedures may be laid down with specifications to ensure that each response team is sensitised and equipped with appropriate and adequate response equipment and personal protective equipment (PPE kits), in view of effective zoonotic diseases and pandemic prevention, management and control.

5.2 MEASURES DURING AN EMERGENCY SITUATION

5.2.1 IDENTIFICATION OF THE ELEPHANT-IN-CONFLICT

Identification of individual or group of Elephants-in-conflict to be characterised into casual (opportunistic) or repeated

(obligatory) crop foraging individuals/groups, which may result from Elephants with their natural movement adjoining the periphery of the forest, or Elephants which exclusively move within the crop lands due to the attractions, resulting in their localisation. The following steps may be taken for identifying the Elephant that causes conflict:

- The movement area of the Elephant in conflict may be demarcated or mapped.
- Follow the track marks and other distinct signs to confirm and track the presence and absence of Elephants.
- Investigate all conflict-related incidents within the region.
- Deploy a number of cameras at strategic locations depending on their predictable movement.
- Investigate the existing camera trap database if available and identify the individual based on the distinct morphological identification features.

5.2.2 OTHER KEY RESPONSE ACTIONS DURING AN EMERGENCY

- Operating Procedures may be laid down to receive, channelise and disseminate information at the onset of any emergency, from site of the incident, to related forest officials, HWC Mitigation Hub and further information dissemination, to requisition related response action at the emergency site.
- Specifications may be detailed for mobilisation, activation and deployment of response teams on ground to respond to the emergency situation.
- Adequate arrangements may be made to provide first aid to the person facing a health emergency condition, and then his/her quick transfer to the nearest available equipped hospital should be facilitated. It is also critical to ensure occupational safety and health of the forest department personnel before, during and after any response operation.
- During an HEC situation, it is very essential to maintain public order and tranquillity through effective crowd management. SOPs indicating the specific roles and responsibilities of the forest department officials, District Magistrate/administration, police department, fire department, emergency services (NDRF, SDRF, paramilitary forces), health department, animal husbandry department, relief/revenue Department; first responders, specialised responders and other volunteers in crowd management should be laid down clearly, and these should be agreed to by all the stakeholders.
- The role of the media, before, during and after HEC situations should be discussed to ensure they participate effectively in crowd management and other mitigation measures.

5.3 MEASURES AFTER AN EMERGENCY SITUATION

- Operating Procedures may be laid down for reporting and process documentation of the response operation, including detailed on step-wise response actions taken and challenges faced, further Insights into the conflict and its future management, key follow up actions that need to be taken, if any, to resolve the issue (incident), management of animal if a capture was required, and assessment of the need to monitor the location for a few days to discourage any retaliatory actions

6. REDUCING THE IMPACT OF HEC ON HEALTH AND OVERALL WELL-BEING OF THE AFFECTED HUMANS

Humans living in Elephant range areas are familiar with its habits and behaviour and are accustomed to Elephant presence in the area. Although they are aware of how to react to the situations, many a times, things go beyond control and marginal farmers face losses due to HEC. Moreover, due to dispersal and colonisation of Elephants in new areas, people are not familiar with Elephants and are less tolerant of the damage caused in conflict.

A major response to HEC has been compensation for losses, but little evidence exists to support the claims that these schemes have an impact on people's attitude or the impact on the conservation of wildlife. Moral hazard, optimisation and leveraging of compensation schemes are a challenge.

Measures, which may encourage people to work towards harmonious co-existence, include participatory planning, awareness and communication for change the threat perceptions, integrating HEC mitigation into poverty alleviation programs and community-based natural resource management, and other site-appropriate stakeholder engagement measures, such as.

- Compensation for economic loss from damage to crops by Elephant activities, or personal injury or risk from Elephant encounters, is meant to increase community tolerance towards Elephants
- Insurance schemes require participants to pay a premium, for insurance against economic loss. This premium is determined based on the risk associated with HWC/HEC. The challenges of high premiums charged (due to high risk) have been addressed in some areas, by supplementing premiums with government or non-governmental funding support, community financing (e.g., through ecotourism), or better risk evaluation. Dialogue with insurance sector may be initiated for providing insurance cover for damages due to HEC. Modalities may vary for such programme from place to place based on assessment of risk by the Insurance companies. Feasibility may be explored at the state level
- Performance payments for community support for conservation may also be explored as an instrument, where the EDCs / VFCs can be provided funds for conservation-linked performance payments, and experiences and learnings can be shared back, for further refinement of these guidelines
- Conservation Easement may be a good instrument for mitigation of conflict, which could be explored by incentivising conservation for mitigation of conflict and as an innovative mechanism, where farmers can be compensated for keeping these areas fallow for part of the year for wild animals or no/reduced gain from the farming income. Experiences and learnings can be shared back, for further refinement of these guidelines.

6.1 ADDRESSING THE SITUATION OF LOSS OF HUMAN LIFE

The dimensions of human death are many folds. It's not simple to fathom the loss of human life to the family of the victim. The primary assumption behind ex gratia is that the loss of life of any individual cannot be compensated. Therefore, any amount paid to the family of the victim is mere consolation or a kind of solatium.

The following measures may be implemented to effectively address the situation:

- Part of the *ex gratia* payment may be made immediately to the victim's family/heirs and the balance payment may be made at the earliest.
- The payments to the victim's family should be made into their bank accounts.
- In the HEC hotspots, a revolving fund may also be established, at the division-level, to ensure availability of funds for providing immediate relief to the victim/ family.
- Possibility of setting up of foundations in the territorial divisions, for extending sustainable support to the victim, can also be explored. The minimum *ex gratia* payment may be kept in conformity with the Gajah (Elephant Task Force) [13] recommendation by various states.

6.2 ADDRESSING THE HEALTH AND OVERALL WELL-BEING OF THE AFFECTED HUMANS

- In the case of injury, as a result of encounter with Elephant, the victim needs to be immediately hospitalised and *ex gratia* should be paid, as per the state government norms.
- Professional counselling through qualified psychiatrists/ health workers will be useful to check the effects of such traumatic incidents.

13 Rangarajan, Mahesh, Ajay Desai, R Sukumar, PS Easa, Vivek Menon, S Vincent, Suparna Ganguly, BK Talukdar, Brijendra Singh, Divya Mudappa, Sushant Chowdhary and AN Prasad. Gajah. Securing the Future for Elephants in India. The Report of the Elephant Task Force,

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- The SFDs and other government agencies/ institutions may organise some counselling sessions for such victims and support them in coming out of this psychological impact.

6.3 ADDRESSING THE SITUATION OF PROPERTY DAMAGE

Ex gratia for property damage does not generally consider the cost of repairing and the costs of temporary fixes that are needed prior to repairs. The poor are affected more as their houses are of low value and damages do not consider the fact that the main costs is actually labour that the family provides in reconstruction and not the cost of materials themselves.

- Property insurance should be the ultimate goal. Awareness and adoption of options regarding property insurance should be given priority. However, till the system is fully established, present system of payment of compensation should be continued and enhanced by factoring in the hidden costs and losses. Compensation for damage to property (including buildings) should be in accordance with the state government rules, and may be made at the earliest.
- Mobile application-based system may be developed, to evaluate the loss of property and *ex gratia* paid to the property owner.
- Elephant may enter urban areas and semi-urban area close to the forest, which may create panic amongst residents. The following measures may provide relief and assistance to the community. SFDs may coordinate with the respective resident welfare associations for *ex gratia* payment in the event of loss of property and human injury

6.4 ADDRESSING THE SITUATION OF CROP DAMAGE AND LIVESTOCK INJURY/LOSS

The long-term impacts of assessment of crop compensation amount are complex. While payment of inadequate compensation to farmers will lead to resentment among humans, leading to adverse impact on wildlife conversation due to retaliatory killings. Payment of compensation is equally challenging as it might also lead to laxity in crop protection by the farmers, and inhibit possible innovations for crop guarding.

- Ministry of Agriculture and Farmers Welfare have included the crop loss by activities of wild animals under its flagship scheme *Pradhan Mantri Fasal Bima Yojana* (PMFBY), which can be used as an important HWC mitigation instrument. However, till the system is formally established in remote forest areas, the existing system of direct payment of compensation to farmers should be continued.
- The process of settling crop or property loss compensation should be transparent and simplified. Mobile apps may be used for collecting the information and processing of claims of farmers, after crop losses from Elephant activities, to ensure efficiency and transparency in the system. Experiences and success-story sharing across states can facilitate further improvements in the system.
- Farmers may be encouraged, facilitated through community-based institutions, to explore solutions such as change in cropping pattern, use of non-palatable crops etc.
- Collaborative efforts can be made to promote market-based arrangements for alternate crops, wherever feasible. Community Primary Response Teams (PRTs) may be engaged to facilitate this process in their respective villages/ areas of operations.
- Site-specific studies may be conducted to find out appropriate crops that are non-palatable to Elephants, in collaboration with agricultural institutions.
- Ensure sufficient delegation at field-level for deciding and disbursing *ex gratia*/compensation for its effective use for addressing possible trauma due to HEC
- Livestock loss or injury, as a result of encounter with Elephant, are not common. However, cattle tethered near or in Elephant movement paths may be at risk. SFDs may coordinate with Animal Husbandry Department for providing livestock insurance coverage in HWC hotspots. To reduce conflict and risk of loss of livestock inside the forest areas, it is encouraged to stall feed the livestock in HWC hotspots.

6.5 ADDRESSING THE SITUATION OF LOST LIVELIHOOD OPPORTUNITIES

- HEC may deprive humans of their jobs, or reduce their ability to raise income, and thus diminish their capacity to make a living. *Ex gratia* and compensation in an important coping mechanism, but specific measures may be required to ensure long-term sustainability of livelihoods at the HWC hotspots. Following measures may be planned and implemented, with cross-sector cooperation:
- Systematic assessments of the extent and scale of lost livelihood opportunities and other indirect impacts, due to HEC, may be conducted
- Development of skills for alternative non-land/non-farming-based income generation opportunities
- Creation of self-help groups (SHG) for facilitating small businesses that adopt alternative non-land / non-farming based livelihoods.

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7. REDUCING THE IMPACT OF HEC ON THE HEALTH AND WELL-BEING OF ELEPHANTS

Indian laws take a very strong stand on animal welfare. There are enough provisions in national and state laws to avoid and prevent cruelty and harm to animals.

- All the care should be taken to address the issues of Animal Welfare and Animal Rights as enshrined in the Constitution (Article 48A and 51A(g)), and as per the statutory provisions made under the Indian Penal Code (Sections 428 and 429), Prevention of Cruelty to Animals Act of 1960 (Section 11(1)(h) and Section 11(1)(d)), Motor Vehicles Act 1978 (Transport of Animal) Rules, 2001) and guidelines issued by the MoEF&CC.

7.1 ADDRESSING THE HEALTH OF ELEPHANTS DURING CAPTURE AND POST-CAPTURE OPERATIONS

Capturing of Elephants can be for different purposes, for example capture can be for radio-collaring to be used for research purposes, or for early warning and rapid response treatment of injured Elephants or rescuing abandoned calves, or removal of Elephant from conflict space for the purpose of translocation or bringing it into captivity.

Operating procedure (OP), providing step-by-step procedure and approach for tracking and capturing Elephant/s as a mitigation measure, may be developed. Separate Operating Procedures for radio-collaring, treatment and transport to be developed to ensure animal health and safety during such operations.

Post-capture management of Elephants includes knowing the position of the captured animal (captured through immobilisation), monitoring physiological parameters and transportation of the animal. Currently, most of the capture of Elephants is done through immobilisation.

- The first & foremost thing after immobilisation of the Elephant is to restrain it securely in a comfortable position to maintain airway.
- Following drug induction, the Elephant should be approached (from the rear) keeping safety in mind.
- Post capture health examination and monitoring of the immobilised Elephant is mandatory.
- The physiological parameters (temperature, respiration, pulse and colour of mucous membrane) need constant monitoring, as these are likely to be compromised during chemical capture.
- Any significant deviation in normal physiological parameters should be dealt with appropriately.

Health Examination post capture & Critical monitoring of the immobilised Elephant:

- Once the Elephant is properly positioned, the Veterinarian should examine its health status and monitor its vital signs (pulse, respiration rate, temperature, blood oxygen level etc). Accordingly, it may be decided whether the radio collaring or capture operation will continue or the animal needs to be revived due to some complication/health emergency and released.
- A checklist of parameters may be elaborated.

Transportation post capture:

- The animals should be transported in specially designed vehicles or large containers (for long distance) or on foot (for short distance).
- The vehicle should be designed considering the animal's weight, adequate ventilation options (containers), sound non-slippery floor, provision of drainage to facilitate disposal of waste etc.
- The animal needs to be appropriately secured in the vehicle and necessary transport considerations should be in place during transit.
- Alternatively, the animal can be hoisted on the vehicle using slings/ropes/belts taking due anatomical and physiological considerations strictly under veterinary supervision and using a skilled crane operator.
- Stops en-route should be pre-planned and identified well in advance aimed at achieving the shortest journey time possible and ensuring safety and wellbeing of the animal.
- The animal needs to be regularly monitored for signs of discomfort or stress during the entire journey period by veterinary professional, and the Elephant maintained in a sedated state.
- Koonkies, if available, should be used in moving / pushing the animal into the vehicle/ container.

Food and water during transportation

- It is better to avoid provisioning of feed and water during overnight transport and efforts should be made to reach the destination (release site/ Elephant camp/ designated facility) as early as possible taking due care of vehicle speed and halting destinations.
- Water should be made available to the animal during transportation especially on hot journeys exceeding 6

hr. Water should also be at hand to control possible hyperthermia of recumbent animals.

7.2 RELEASE ESSENTIALS

- 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.
- The animals should be monitored for any transport injuries or any other health-related issues following release.
- The release sites should have proper off-loading facility and release should be done with the least possible stress on the Elephants.
- Following release in native habitats, it is necessary to monitor the behaviour of the animal/s and its interaction with the other herbivores
- The animal should be monitored post-release, for injuries, wounds, ill-health and disease such as nervous, locomotive or digestive disturbance by team of veterinary professionals, biologist and manager during the initial period.
- There is also a need for long-term monitoring of the health of the released individual/ population.
- 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 or the risks of release into the wild are too high. If Elephants are retained in captivity, it is essential to consider their proper welfare and utilisation.
- In case destined for captivity, the animal should be held in fenced enclosure/ Kraal. This would provide chances for animal to recover from anaesthetics, in getting acclimatised to their surroundings at new destination and provide opportunities for intensive monitoring and veterinary management.
- In case the Elephant is required to be kept in captivity, the space provided to the Elephant should be as per the guidelines issued by the Project Elephant division, MoEFCC.
- Proper sanitation and hygiene should be maintained to avoid chances of infection
- Adequate balanced food and water should be made available along with mineral and vitamins supplements as per the health status of the Elephant.
- Health Screening: A general health screening once a week should be done and a thorough health examination should be done at least once in a month. Bi-monthly foot dip, foot care and nail trimming should be carried out to prevent foot problems. In case of suspicion of some serious health condition, samples should be collected and sent to institutes like Indian Veterinary Research Institute (IVRI) etc. for more advanced investigations.

7.3 REHABILITATION OF THE CAPTURED ELEPHANT

- In the case of Elephant brought into captivity temporarily for treatment, their release post treatment should take into consideration their past record in conflict.
- Elephants that have a record of high conflict cannot be released back as they are more habituated to humans when compared to the Elephants not causing serious conflict, which can be released back with adequate monitoring.
- States having wild Elephant population may envisage at least one Elephant rescue and rehabilitation centre and should follow CZA guidelines for their management.
- Chief Wildlife Wardens should ensure that Rescue and Rehabilitation Centres for Elephants as well as housing facilities for captive Elephants are maintained properly to avoid complaints about cruelty/ ill treatment of Elephants.

7.4 MANAGING ORPHANED/STRAY ELEPHANT CALVES-IN-CONFLICT

An Elephant calf, in the wild, is orphaned due to several reasons and special care is required to handle it, as follows

- The rescued calf should be raised under guidance of a veterinarian by an experienced senior/dedicated mahout. It should be handled only by one mahout with full precautions about hand hygiene and hygiene of the room/enclosure in which the calf is housed.
- For young calves below the age of 1 year, the constant presence (24 x 7) of the mahout is critical as stress of separation can very adversely affect its survival. If there are adult female Elephants in the facility and one of them is tolerant to the calf, then the calf should be raised in its presence as the female will acts as a foster mother.
- The calves should not be exposed to humans as they have a weak immunity and may contract the diseases quickly.

7.5 RADIO COLLARING OR TAGGING (RFID-MICROCHIP) AN ELEPHANT

Elephants may be radio collared before release. Radio collars are important for HEC mitigation with the objective of understanding ranging behaviour and other information.

- Ranging behaviour studies will help to better understand how and why certain Elephants come into conflict and help the development of customised conflict mitigation measures including RRT deployment, aversion conditioning, barriers, community awareness about preventive behaviours/actions, etc. These studies will also help to ascertain the effectiveness of mitigation methods and also in understanding how Elephants respond to these methods and how these methods impact Elephants.
- Radio collaring may also facilitate enhancing the effectiveness and efficiency of the response teams, as using real-time location information from satellite collars can help RRTs to intervene early and stop Elephants from coming into conflict.
- It is useful to radio collar an injured Elephant to monitor it systematically for medical intervention over an extended period of time.
- Radio Frequency Identification Device (RFID) may be used for tagging captured wild Elephants brought to captivity

7.6 HEALTH AND WELL-BEING OF PRIVATE AND TEMPLE ELEPHANTS

- There are several instances of private Elephants and temple Elephants not being managed properly and going out of control, often during processions, due to loud music, crackers and presence of large crowd etc. The captive Elephants need to be managed as under:
- As far as possible, Elephants may be kept away from the congested places and large crowds. Assembly of Elephants in temples or other public places should not be permitted unless the organisers 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 including their behaviour in the crowd and public functions. Operating Procedures (OPs) should be 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.
- Guidelines for care and management of captive Elephants issued by the MoEF No. 9-5/2003 PE dated 8.1.2008 for transportation, housing, care, feeding, work etc should be strictly followed including maintenance of necessary records and registers.

8. USE OF LEARNINGS FROM THE GUIDELINES TO FURTHER STRENGTHEN INSTITUTIONAL AND POLICY FRAMEWORK ON HEC MITIGATION IN INDIA

These guidelines are expected to serve as a capacity development instrument, given that a robust and structured feedback mechanism will be put in place, to document the feedback coming from implementation of them.

- The feedback from use of these guidelines may, therefore, be consolidated, to form the basis for fine-tuning these mitigation measures, and also understanding capacity needs for effectively implementing the mitigation measures.
- In the long term, the consolidated feedback may also be used in further reviewing the capacity development strategies, HWC-MAPs, HWC-SAPs, and HWC-NAP.

9. PROCESS OF DEVELOPMENT, PILOT TESTING OF THESE GUIDELINES AND CONSULTATION PROCESS

- A dedicated framework of experts (Annexe 1) was formed, consisting of representatives from Government agencies, SFDs, research institutions, civil society institutions, International organisations and independent wildlife policy experts as members of the core team. The experts were a mix of scientists, wildlife managers, policy experts, and capacity development experts.
- A common understanding was developed on the overall purpose, scope, approach and methodology.[14] The experts implemented different roles in the drafting and editing process, viz. Coordinating Lead Authors, Lead Authors, Contributing Authors, and Review Editors. The Author Group worked on developing these Guidelines during July 2019- August 2021, while consulting a larger group of experts and stakeholders via workshops, meetings and consultations. The authors reviewed the existing documents and guidelines available from the MoEF&CC and different states, and relevant information and recommendations were brought into this new document. A National Technical Group (NTG), consisting of experts from MoEF&CC, Wildlife Institute of India (WII), *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ), and independent wildlife and policy experts, was formed for overall steering and facilitation of the process. A 'Working Group on Pilot Implementation of Guidelines and HWC-NAP' was formed to facilitate planning and implementation of pilot testing, consultations and final editing of draft guidelines and HWC-NAP. Detailed terms of reference of each of this category was provided and meetings and workshops of the author groups were facilitated under the Indo-German Cooperation Project on Human-Wildlife Conflict Mitigation.
- The draft guidelines and HWC-NAP were pilot tested at selected HWC hotspots in India, to test and receive feedback on the feasibility and acceptability of the recommendations expressed in the Guidelines, using structured process and tools. Based on the feedback received during fortnightly meetings and one to one consultations with managers, the draft of the guidelines was revised.
- A Committee was constituted by MoEFCC in December 2022, consisting of officials from MoEFCC, and the state forest departments of Bihar, Haryana, Karnataka, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal to review and finalize the guidelines.

10. MONITORING AND EVALUATION OF GUIDELINES

- This set of guidelines is not a static document; rather, it is a living document. It will keep abreast of the various developments in field implementation methods and wildlife research. For this, the feedback from field practitioners and other wildlife experts may be analysed to assess the specific elements and sections that need to undergo changes. A review of the guidelines is planned to take place every 5 years from 2023 onwards. However, a mid-term review process in 2024 may be desirable. In the long term, the review cycle of these guidelines can be aligned with the review cycle of HWC-NAP.
- Detailed mechanism, templates and guidance used for collating information and feedback on the use of these guidelines may be developed.

14 Approach paper: https://indo-germanbiodiversity.com/pdf/publication/publication19-04-2021-1618808050.pdf

ANNEXE 1

NATIONAL TECHNICAL GROUP (NTG)

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Ministry of Environment, Forest and Climate Change
Government of India
2023

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ANNEXURE-III

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Item No. 01 (Court No. 01)

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

(By Video Conferencing)

Original Application No. 142/2021

(With reply dated 07.07.2021 & report dated 08.07.2021)

(In re: News item published in The Hindu, dated 29.05.2021 titled **"Night, early morning trains cause most elephant deaths")**

Date of hearing: 08.07.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER
HON'BLE MR. JUSTICE M. SATHYANARAYANAN, JUDICIAL MEMBER
HON'BLE MR. JUSTICE BRIJESH SETHI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Respondent: Mr. Ram Shankar, Advocate for the State of Tamil Nadu
Mr. K. Muthamil Raja, Advocate for Southern Railways

ORDER

1. This matter has been taken up based on the media report titled "Night, early morning trains cause most elephant deaths" in Hindu dated 29.05.2021[1]. The substance of the news item is that death of elephants is taking place on a railway track from Kottekad and Madukkarai. In all, seven elephants have been killed as per the media report between 10:00 pm to 06:00 am on being hit by the trains on 'B' line and one elephant was killed on 'A' line of the map given in the media report. 'A' line runs through reserve forest for 17 km between Chullimada-Madukkarai stations and 'B' line passes through reserve forest for 23 km between Madukkarai- Kanjikode stations.

[1] The Hindu dated 29.05.2021: https://www.thehindu.com/news/cities/Coimbatore/night-early-morning-trains-cause-most-elephant-deaths/article34671423.ece

2. An advance notice dated 02.07.2021 was sent by the Registry to MoEF&CC, The Principal Chief Conservator of Forest (Wildlife) & Chief Wildlife Warden, Government of Kerala, The Principal Chief Conservator of Forest & Chief Wildlife Warden, Chennai and General Manager, Southern Railway by e-mail. A status report has been filed on behalf of the State of Tamil Nadu.

3. Reply has also been filed by the Southern Railways as follows:-

"2. The 4th respondent / Railways humbly submit that the Palakkad - Podanur electrified broad gauge double line railway track of Southern Railway passes through the reserved forest in the western Ghat between Kanjikode and Madukarai railway stations. The track between Km 486 to 534 is being separated by twin single lines- 'A' & B' line. The Podanur-Palakkad down line is 'A' line laid during the year 1861 and Palakkad - Podanur UP line is 'B' line which was newly constructed in 1974 comes in the Ghat section both in Kerala &Tamil Nadu States. The length of 'A' line is 48.26 km and 'B' line is 52.56 km with 8 stations. It is pertinent to note that Palakkad Division has taken various steps to mitigate train accidents involving elephants in last few decades.

3.The 4th respondent / Southern Railway Palakkad Division has taken all measures for elephant track crossings as envisaged in Provisional Para No.34 finalized by DAI (Railways) for C&AG's Report (Railways) for the year ended 31.03.2019 regarding "Provision of Elephant passages in Indian Railways". Some of the main Recommendations of C&AG Report and action taken on the same are detailed below:

- *Identification and notification of elephant passages should be reviewed periodically in consultation with the Forest Department.*

  The Palakkad Division and Forest Department of Palghat and Coimbatore District reviews the elephant crossing passages during their regular review meeting. The review is done on a regular basis apart from specific reviews based on movement of elephant inside forest ranges and sighting/crossing of elephant near railway track as reported. The following sections are identified as elephant passages and Permanent Speed Restriction (PSR) of 45 kmph imposed from dusk to dawn (18.00 hrs to 06.00hrs).

'A' LINE

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SN	Between Stations	UP/DN Direction	From km	To km	Speed Restriction (in KMPH) (18.00hrs to 06.00hrs.)
1	Madukkarai - Ettimadai	DN	497/6	499/4	45
2	Ettimadai - Kanjikode	DN	505/0	515/0	45
3	Kanjikode- Palakkad	DN	525/10	527/20	45
4	Palakkad - Kanjikode	UP	527/20	525/10	45
5	Kanjikode- Ettimadai	UP	515/0	505/0	45
6	Ettimadai- Madukarai	UP	499/4	497/6	45
7	Ettimadai- Walayar - Kottekad	UP&DN			Whistle continuously since wild elephants likely to cross the track

'B' LINE

SN	Between Stations	UP/DN Direction	From km	To km	Speed Restriction(in KMPH) (18.00hrs to 06.00hrs.)
1	Madukkarai- Ettimadai	DN	497/3	499/3	45
2	Ettimadai- Palakkad	DN	505/0	520/31	45
3	Kanjikode- Palakkad	DN	525/0	527/25	45
4	Palakkad - Kanjikode	UP	527/20	525/10	45
5	Palakkad- Ettimadai	UP	520/31	505/0	45
6	Ettimadai- Madukkarai	UP	499/3	497/3	45
7	Ettimadai- Walayar - Kottekad	UP&DN			Whistle continuously - since wild elephants likely to cross the track

Speed restriction of 45kmph is imposed for 13.9 km in 'A' line from 18.00 hrs to 06.00 hrs and in 'B' line, a total of 19.41km is having a permanent speed restriction of 45kmph from 18.00 hrs to 06.00 hrs on account of frequent crossing of wild elephants and a PSR of 65kmphfor passenger trains and 25kmph for Goods train for a length of 18.84 kms in A line. Similarly, a PSR of 65kmph for passenger trains and 25kmph (DN Direction)/ 35 Kmph (UP Direction) for Goods train for a length of 27.5 kms exists in B line. (Copy of WTT is enclosed).

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- *Sensitizing programme of awareness workshop should be conducted for Station Masters/Train drivers/Guards to sensitize them aboutelephant conservation.*

  Joint meeting with Forest Rangers of Forest Department and Supervisors and Officers of Palghat Division from Railways to sensitize the Loco Pilots/Guards/Keyman/Trackmen about elephant conservation and working on track. A workshop was conducted on 07/02/2019 at Palakkad by Forest Department on the topic of Human elephant interaction, which was attended at the level of DRM/PGT and concerned Divisional officers. The various measures undertaken by PGT Division to mitigate elephant run over was discussed during the course of the workshop.

- *The signage boards to pre-warn the drivers should be standardized w.r.t. colour, shape, height, placement, position etc;*

  In In PGT Division, the erected signage board is as per the MoEF recommendations circulated by Railway Board in September 2017 and the design given by Wild Life Trust of India at desired locations to pre-warn the Train Drivers.

In addition to above, the general advisories circulated vide Railway Board's Letter No.2011/TT-IV/9/8 dated 30/03/2010 like regular clearance of vegetation alongside the track, fixing of signage boards, sensitizing programme for train drivers /guards etc. are being followed. As suggested by the Parliamentary standing committee, a co-ordination committee between Railways (at the level of DEN) and Forest Official (at the level of DFO) is being made and periodical review meeting is also conducted.

CASES OF ELEPHANT HIT BY TRAIN:

The first case of elephant death on railway track was reported in 1978 at km 507/600-700 in 'A' line. The Loco Pilots are sensitized to report any elephant sighting as well as any elephant hit case through Control which is immediately informed to Forest Officials. The year wise details of Elephant hit cases between KJKD MDKI section is tabulated below:

SN	Year(s)	No of Elephant Hit Reported
1	2010	1
2	2010 to 2015	NIL
3	2016	4
4	2017	NIL
5	2018	1
6	2019	2
7	2020	3
8	2021	1

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The detailed tabulation of cases is attached vide Annexure A (Excel Sheet).

There is no dispute of reporting of elephant hit/ death between Forest and Southern Railway of Palakkad Division.

4. *The 4th respondent / Southern Railway submits that the following are the effective measures taken by the Southern Railway Palakkad Division;-*

VARIOUS MEASURES TAKEN BY PALAKKAD RAILWAY DIVISION TO MITIGATE ELEPHANT HIT BY TRAINS

1. Speed Restriction on the Vulnerable Section:

Speed restriction of 45kmph is imposed for 13.9 km of vulnerable section in 'A' line from 18.00 hrs to 06.00 hrs and in 'B' line, a total of 19.41 km of vulnerable section is having a permanent speed restriction of 45kmph from 18.00 hrs to 06.00 hrs on account of frequent crossing of wild elephants (Copy of WTT is enclosed.). Even during the daytime, a permanent speed restriction of 65kmph is imposed in these vulnerable sections for passenger trains and 25/35kmph for Goods trains. Standing Committee on Railways 2013 had recommended speed restriction of 50 kmph at vulnerable locations as agreed both by Forest and Railway Department.

2. Sic:mac4e boards to pre-warn the Train Drivers:

The signage design given by the Wild Life Trust of India has been erected at desired locations to pre-warn the Train Drivers and also to whistle continuously to warn the Elephants. Special attention is given for maintaining the visibility of these signage boards.

3. Wires with low voltage at boundary to deter elephants:

In Kerala Forest area, solar fencing at ground level with safe electric voltage of 12Vhas been provided for a length of 7.1 km in 'B' line near railway track area and 3.2 km in 'A' line to deter elephants. The fencing has been proven very effective to prevent entry of elephant herds inside railway track area.

4. Elephant Ramps:

Ramps are being provided at suitable locations for passage of elephants without getting entrapped near railway track area. The locations for provision of ramps are jointly decided by Railway and Forest Department. At present, elephant ramps are provided at Km 506A/100, 506/400, 506A/300 in Ettimadai-Walayar section at high bank location as per the guidelines from Tamil Nadu Forest Dept for easy passage of elephants. Watch Towers has also been provided inside Forest Area at dedicated locations to map the movement of elephant out of Forest area. Railway is providing more ramps at suitable locations in Railway Embankment area along with Cess widening work in consultation with Forest Department of Kerala and Tamil Nadu.

5. Lights toward away elephants from Railway Cutting:

Between Kanjikode and Walayar, Railway line is passing through two cuttings — first one at Km 510/900-511/200and

other one at Km 512/200-400.Therearechancesofelephant getting trapped inside these cuttings, so solar lights have been provided to ward away elephants at both ends of the cutting. The solar lights also help in improving the visibility for Train Drivers during night time.

6. Installation of audio alarm with honey bee sound

This has been installed at Level Crossing number No. 154 between Kanjikode and Walayar on 'A' line to scare away the elephants. This system has been adopted based on the successful trial conducted in NFR earlier. It is informed that after installation of the audio alarm system, no case of elephant crossing near the level crossing is reported.

7. Widening of Cutting & Cess making:

Earth work for widening of cutting has been done between Km 513/500 - 519/400, Km 500/00 — 505/00 on 'B' Line. This will help the elephant to move away from track on sighting of coming train, as sufficient space has been made available there. To further safeguard elephants near Railway track area, Cess widening including provision of ramps at three more locations between Kanjikode and Madukarai is in progress at a cost of Rs 6.4 crore. Moreover, manmade pondswere made at the toe of cutting so that elephant need not cross the track in search of

water during summer.

8. Engagement of elephant trackers by MoEF and communication with Station Masters:

Elephant Trackers have been deployed by forest Department of Tamil Naduand Kerala and a system of communication have been set up with Railway Control. TheLoco Pilots are pre-warned by control in case any information of elephant sighting is reported. This is major action which is helping to control the accidents.

9. Sensitizing Programmes for Train Drivers/Guards/Station Masters:

Regular sessions are held with Forest Department to sensitize the Loco Pilots for taking action to protect the Elephants at Palakkad. Regular meetings with DFO/Palghat (Forest) and DEN/East/Palghat (Railways) is also conducted for discussion on various issues related to Forest and Railways. Last meeting was conducted at DFO Office Palghat and attended by DEN/East/Palghat and ADEE/G/Palghat to study the working of Hanging Solar Fencing on 25th June 2021.

10. Under passes across the Railway Track to allow elephants to escape:

Railway Board vide letter No. 2008/CE-II/Safety/1(Fencing) dated 07/12/2010 has circulated the minutes of the inter-ministerial meeting between Railways and the Ministry of Environment and Forest held on 05/03/2010. One of the decisions taken in the above meeting was that the Ministry of Environment and Forest will bear the cost of work and

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the work will be executed by the railway on deposit terms. In this connection and as recommended by the WTI in their report a rough estimate of three work(Tamil Nadu area) mentioned below was prepared and sent to Principal Chief Conservator of Forests & Chief Wildlife warden, Panagal Maaligai, Saidapet, Chennai — 600015 (on 28/11/2012) for their acceptance and remittance of required amount to process further.

1 Rail fencing and widening cuttings and side drains between Madukarai and Walayar stations 'A'&'B' lines)	=	Rs.25, 08,30,268/-
2 Under bridge on B line at km 506/900-506/A-000 between Ettimadai and Walayar Stations	=	Rs.2, 15, 43,337/-
3 Under bridge on B line at km 505A/400-500 between Ettimadai and Walayar Stations	=	Rs.2, 16, 51,199/-
Total		= Rs.29, 40, 24,804/-

Similarly, in Kerala area also, a detailed estimate for provision of fencing for a length of 20knns (at km510/0 to 513/0 'A' line for 3km & at km 510/500 to 518/0 on 'B' line including Km516Afor 17 kms (both side of the track) was prepared for an amount of Rs.12,11,46,215/- and sent to the Chief Conservator of Forest, Kerala for their acceptance and as a permanent mitigation measure. Despite reminding many times for the same, the centage charges are yet to be remitted by Forest department. Further processing will be done by Railways only after the remittance of the centage charge.

11. *Regular* ***clearing of vegetation:***

As discussed during regular meetings with Forest Department, work of cle4ring of vegetation up to 5 m of track side and 10m of track side at specified locations is being carried out regularly by Railway. The work is being executed by Railway in timely manner in consultation with Forest Department. This clearing of vegetation helps in identifying any elephant hiding inside forest area from a longer distance as well as in improving the visibility for loco drivers to take timely action.

12. Interaction of Forest officials and Railways realtime:

A WhatsApp group has been created with Forest officials including Rangers and Forest watchers and Railway officials including Control offices as part of the group. The real-time movement of elephants entering into Railway track side are immediately reported by Forest officials in the group and immediate lookout caution for LPs n ALPs are issued immediately by Railways at the reported locations. Moreover, Speed restrictions are also imposed immediately at the reported locations whenever the elephants are sighted near to

the track. These steps mitigate the hitting of the pachyderms many a times.

5. The 4th respondent / Southern Railway submits that the following are the various other steps planned to protect the wild life;-

VARIOUS MEASURES PLANNED BY PALGHAT DIVISION TO FURTHER MITIGATE ELEPHANT HIT BY TRAINS

1. Provision of Hanging Solar Fencing parallel to Railway Track:

The hanging solar fencing has been provided in Wayanad and Dhoni range of Kerala by Forest Department and the same has been found to be successful in preventing elephants crossing. Therefore, in consultation with the Forest Department of Palghat, Kerala, it is planned to provide hanging solar fencing for a length of 1.5km between Kanjikode - Walayar section on 'B' line, so as to prevent elephant from crossing into the railway area and at same time, small animals will be able to cross the fence.

2. Elephant Signage Boards:

As agreed, to in the recent meeting held between DFO/PGT and DRM/PGT, twenty more elephant signage boards are to be provided near tracks on locations as jointly inspected and advised by Forest Department. The fixing of boards is planned to be completed by July 2021.

3. Barricading /Solar fencing /Lighting along the Railway track:

To safeguard the wild elephants from collision with trains, an estimate for providing rail fencing, widening cuttings and side drains between MDKI-WRA stations ('A' & 'B' lines) and at km510/0 to 513/0 'A' line for 3km & at km 510/500 to 518/0 on 'B' line including 516A for 17 kms (both side of the track) was prepared and sent to Forest Department for acceptance and remittance of centage charge. The same is yet to materialize.

6. The 4th respondent / Southern Railway submits that the above plan for provision of Hanging solar Fencing, Rail Fencing between Walayar and Madukkarai stations in both 'A' and 'B' Lines and viaducts/elephant underpasses in the identified locations of Elephant crossings could be effectively implemented with the active cooperation of the Forest department and local and state Government. At this juncture this Hon'ble Tribunal may be pleased to fix time frame to execute the project to protect the wild life especially Elephants."

4. According to the status report filed on behalf of the State of Tamil Nadu, reasons for death is visibility on the track being poor to the loco

pilots and topography being unsuitable for the elephants to escape. The remedial action taken is deputing Track watchers/ Anti-depredation watchers, construction of ramps and alerting of the pilots by the watchers. Watch tower has been constructed for the purpose. A percolation pond has been formed for providing water for the animals to minimize the movement. A Whatsapp group has been created of the concerned staff of the Railways and the Forest Department. Forest Department also wrote to the Divisional Railway Manager on 22.03.2021 for precautions to be taken in operation of trains at night and the Divisional Railway Manager has given a reply on 05.05.2021. Further, as per stand of the Railway, in para 10 quoted earlier, an inter-ministerial meeting was held between the Railways and MoEF&CC on 05.03.2012 and steps were to be taken for construction of under bridges, fencing and widening cuttings and side drains but the MoEF&CC failed to make the payment and said step could not be taken.

5. We have heard learned Counsel for the State of Tamil Nadu and considered the matter. We find that apart from the steps said to have been taken in terms of the status report of the State of TN, further measures need to be adopted as emerging from the stand of the Railways as well as in the light of directions on the subject by the Hon'ble Supreme Court.

6. The Hon'ble Supreme Court, vide orders dated 04.08.2017 in *Writ Petition (C) No. 275 of 2015, Vidya Athreya & Anr v. Union of India & Ors.* and dated 22.10.2018 in *W.P (C) No. 489 of 2018, Prerna Singh Bindra & Ors v. Union of India & Ors.*, issued directions to the MoEF&CC to constitute a Central Monitoring Committee to coordinate with elephant bearing States on issues relating to safety of elephants in elephant

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protection zone. The Central Monitoring Committee held a meeting with the concerned States on 29.05.2018 and it was decided that suggestions given in the Gajah Report be implemented by the State Governments. MoEF&CC directed the States concerned to notify elephant corridors.

5. Accordingly, the Central Monitoring Committee constituted by MoEF&CC dealing with the project 'Elephant' needs to look into the issue raised in the media report in coordination with the Railway Authorities, the Wildlife Institute of India and the States of Tamil Nadu and Kerala. A joint meeting needs to be held on the subject by the Central Monitoring Committee of the MoEF&CC with the States of Tamil Nadu and Kerala and the Southern Railways within one month from today to work out the necessary modalities, including the authority which is to incur the necessary expenditure.

The application is disposed of.

A copy of this order be forwarded to MoEF&CC, States of Tamil Nadu and Kerala, the General Manager, Southern Railways and the Wildlife Institute of India by e-mail.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

M. Sathyanarayanan, JM

Brijesh Sethi, JM

Dr. Nagin Nanda, EM

July 8, 2021
Original Application No. 142/2021
SN

ANNEXURE-IV (47)

F.No. 12-1/2019-PE (Part-I)
Government of India/ भारत सरकार
Ministry of Environment, Forests & Climate Change/ पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
(Project Tiger & Elephant Division / व्याघ्र एवं हाथी परियोजना प्रभाग)
****

6th Floor, Jal Wing,
Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj,
New Delhi-110003

Dated 28th August, 2023

To

Senior Executive Director, Gatishakti
Ministry of Railways,
Rail Bhavan, Raisina Road,
New Delhi – 110 001

Sub.: Assessment of the Mitigation Measures for preventing the death of wild animals due to train hits using advanced technology -reg.

Sir,

As you aware, that accidental death of elephants due to train hits is a major concern for elephant conservation in the country. The Ministry of Environment Forests & Climate Change, Govt. of India is taking various steps for prevention of elephant deaths due to train hits. In order to prevent the elephant deaths due to train accidents, North Eastern Frontier Railway has installed a Distributed Acoustic Sensor (DAS) using Optical Fiber Cable Technology at Binnaguri Railway Station, Alipurduar, West Bengal.

Recently, a committee constituted by the Ministry to assess the Distributed Acoustic Sensor (DAS), observed that it is the best available system to detect the movement of elephants close to railway tracks. However, the efficacy of the system further needs to be evaluated based on the movements data, therefore, the committee suggested to install more such system at critical stretches. Therefore, it is requested that DAS system may be installed in other sensitive locations identified by MoEF&CC and WII to assess the significance of the system in prevention of elephant mortalities due to train hits.

Yours faithfully,

(Dr. K. Muthamizh Selvan)
Scientist 'E' (Project Elephant)
Email id: km.selvan@gov.in
Telephone No. 011-20819193

Copy to:

i. Shri Dhananjay Singh, Executive Director, Ministry of Railways
ii. Shri Virendra R Tiwari, Director Wildlife Institute of India, Dehradun
iii. PPS to IGF (PT & E) and Director, Project Elephant, MoEF&CC.

ANNEXURE-V (48)

6-21/2022-PE

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1085802/2023/NTCA

NATIONAL TIGER CONSERVATION AUTHORITY

(STATUTORY BODY UNDER THE MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

Dr. RAJESH GOPAL
Addl. DGF (Project Tiger) &
Member Secretary (NTCA)

Bikaner House, Annexe-V,
Shahjahan Road, New Delhi-110011
Tele : 011-23384428
Fax : 011-23074272
Email : dirpt-r@nic.in

PRIORITY / URGENT

F. No. 7-4/2013-NTCA

Dated the 22nd August, 2013

SANJIP CHAUDHURI NOTARY 6584/2003 BARASAT COURT 24 PGS. (N) GOVT. OF

To,

All Chief Wildlife Warden(s),
Tiger Range States.

Sub: Urgent measures for preventing wild animal mortality due to train hits.

Sir,

As you are aware, railway tracks pass through several tiger reserves and areas rich in wildlife. Time and again, there are reports of wildlife mortality (tiger, elephant, deer, rhino and other species) due to train hits. This has been reviewed at the level of Minister of State for Environment and Forests, and the following urgent measures are suggested/ reiterated:

1. Identification of sensitive habitats along the railway track, based on the ongoing Phase-IV monitoring using camera traps and field patrolling/prior knowledge.
2. Deploying personnel (focal point) for sharing information relating to spatial presence of wild animals between Forest Department and the Railways through VHF wireless on a day to day basis, with a monthly joint review by senior officials of Railway and Forests at the Division level.
3. In high train density areas, a forest personnel (not below the rank of Forester) may be deployed in the Railway Control Room to ensure due coordination relating to wild animal movement.
4. In habitats with gregarious wild animals (elephant, gaur, deer etc.), the herd monitoring should be done on a day to day basis in areas close to railway track for updating the Railway Control Room.
5. Restricting the speed limit of trains in tracks passing through wildlife habitat.
6. Installing 24X7 e-surveillance in sensitive portions using intelligent thermal cameras for generating early warning alerts (near Railway tracks).

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7. Clearance of vegetation on the sides of railway track alongwith appropriate luminescent signages for pre-warning the train drivers.
8. In coordination with the railway authorities, ensuring cleanliness along the railway track for keeping it free from food waste from pantry and water accumulation.
9. The sensitive railway tracks should be illuminated through solar lights.
10. Organising tiger/wildlife sensitization workshops for Railway personnel, while providing information brochure in English/ local vernacular in tiger sensitive zones.

The above ongoing short-term measures should be complemented by appropriate long-term strategy on a site specific basis through overpasses / underpasses, barricading in patches, girder bridges and the like. The central assistance to tiger reserves for such safeguards may be availed from the ongoing Centrally Sponsored Scheme of Project Tiger.

This may be given top most priority.

Yours sincerely,

Rajesh Gopal

(Dr. Rajesh Gopal)
ADG (PT) & Member Secretary (NTCA)

Copy for information to:

1. PS to Hon'ble MEF.
2. PPS to Secretary (E&F).
3. PPS to DGF & SS, MoEF.
4. PS to ADG (WL), MoEF.

Copy for information to:

1. The Chief Secretary(ies), All Tiger Range States.
2. The Additional Secretary(ies) / Principal Secretary(ies), Forests, All Tiger Range States.
3. The Principal Chief Conservator of Forests/HOFF, All Tiger Range States.
4. The Field Director(s), All Tiger Reserves.
5. Regional Offices of NTCA, Nagpur, Bangalore and Guwahati.