**BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL**
**SOUTHERN ZONE-CHENNAI**
**OA.No.257/2024 (SZ)**
**[Earlier O.A.No.925/2024-(PB)]**

BETWEEN

Tribunal on its own motion SUO MOTU
Based on the news item in India Today
Dated 12.07.2024, titled **'CAG slams Kerala forest department for lapses in protecting wildlife habitats'**

Vs

Wildlife Institute of India,
& others … Respondents

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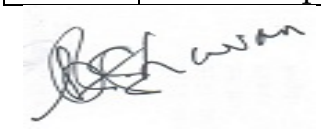

**T.RAGHAVAN**

**Counsel for MOEF & CC**

**BEFORE THE NATIONAL GREEN TRIBUNAL**
**SOUTHERN ZONE, CHENNAI**
**IN**
**ORIGINAL APPLICATION NO.257 of 2024 (SZ)**
(Earlier O.A. NO. 925/2024 PB)

**IN THE MATTER OF:**

Tribunal on its own motion SUO MOTU
based on the news item in India Today
dated 12.07.2024, titled **'CAG slams Kerala's forest department for lapses in protecting wildlife habitats'**

**Versus**

**Wildlife Institute of India**
**Through Its Director and Ors.** **... Respondents**

**Counter Affidavit on Behalf of Wildlife Institute of India (Respondent No.1) and the Ministry of Environment, Forest and Climate Change, New Delhi, through its Regional Office (Respondent No. 2) in response to Hon'ble NGT's order dated 27.09.2024.**

**MOST RESPECTFULLY SHOWETH:**

I, B.N Anjan Kumar, aged about 43 years, working as Assistant Inspector General of Forest (Central), in Ministry of Environment, Forest and Climate Change, Regional Office, Bengaluru (hereinafter 'Ministry') do hereby solemnly affirm and State as under:

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
बेंगलूरु/Bengaluru.

1. That I am duly authorized to swear this affidavit and as such I am conversant with the facts of the present case and competent to swear the present affidavit.

2. That I have read and understood the contents of the accompanying reply and state that the same has been drafted under my instructions based on the official records.

**STATEMENT OF FACTS:**

4. That the Original Application has been registered *suo motu* on the basis of the news item titled **"CAG slams Kerala's forest department for lapses in protecting wildlife habitats" appearing in India Today dated 12.07.2024** by the NGT, PB, New Delhi.

5. That the news item relates to the Comptroller and Auditor General's report slamming the Kerala Forest Department for failing to maintain and protect wildlife habitats in the state resulting in increased human-wildlife conflicts. As per the article, the report highlighted that Kerala witnessed 29,798 cases of wildlife attacks between 2017 and 2021, with 445 fatalities. Wayanad alone recorded 6,161 cases of wildlife attacks.

**REPLY ON MERIT:**

6. It is submitted that the Ministry of Environment, Forest and Climate Change has issued an advisory on 6th February, 2021 to all States/UTs to deal with human

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
बेंगलूरु/Bengaluru.

wildlife conflict situations. The advisory recommends coordinated interdepartmental action, identification of conflict hot spots, adherence to Standard Operating Procedures, establishment of rapid response teams, formation of State and District level committees to review the quantum of ex-gratia relief, and prompt payment of relief to affected persons, and sensitization and awareness drives.

**A copy of the Guidelines is placed as Annexure-1.**

7. It is respectfully submitted that the Ministry has also issued species-specific guidelines to deal with human-wildlife conflict situations. The Ministry provides technical support to forest departments in this matter through the Wildlife Institute of India/SACON, which also includes to build capacity of the frontline staff, especially with respect to use of early warning systems, modern technology and advanced tracking systems for better management of human wildlife conflict situations in these areas.

8. It is submitted that the Southern Regional Office of the National Tiger Conservation Authority (NTCA) is coordinating for facilitating Inter-State Coordination with all the relevant stakeholders in the States of Kerala, Karnataka and Tamil Nadu, with a view to address human wildlife conflict issues.

9. It is most respectfully submitted that the Central Government provides financial assistance to States and UTs for conservation of wildlife and its habitats under the Centrally Sponsored schemes, namely, 'Development of Wildlife Habitats', 'Project Tiger' and 'Project Elephant'.

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
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Integrated Regional Office
बेंगलूरु/Bengaluru.

10. It is submitted that the Ministry has enhanced the ex-gratia payment for human casualties due to human-wildlife conflict from Rs. 5.0 lakh to Rs. 10.0 lakhs under Centrally Sponsored Scheme of 'Integrated Development of Wildlife Habitat.'

11. It is submitted that Section 11 (a) empowers the Chief Wildlife Warden for 'hunting' any wild animal listed in Schedule I of the Act, if it has become dangerous to human life. The proviso under this section provides that no wild animal shall be ordered to be killed unless the Chief Wild Life Warden, is satisfied that such animal cannot be captured, tranquilized or translocated. It also provides that no such captured animal shall be kept in captivity unless the Chief Wildlife Warden is satisfied that such animal cannot be rehabilitated in the wild and the reasons for the same are recorded in writing.

12. It is further submitted that Section 11 (1) (b) of the Wild Life (Protection) Act, 1972, empowers the State Chief Wildlife Warden to grant permission to any person to hunt any wild animal or group of animals, listed in Schedule II, III or IV, in a specified area, that has become dangerous to human life or to property (including standing crops on any land).

13. It is respectfully submitted that the Government of India, through the National Tiger Conservation Authority, has advocated a three pronged strategy to manage human-tiger negative interactions as follows: -

i. **Material and logistical support**: Funding support through the ongoing Centrally Sponsored Scheme of Project Tiger, is provided to tiger reserves for acquiring capacity in terms of infrastructure and material, to deal with tigers dispersing out of source areas. These are solicited by tiger reserves through an Annual Plan of Operation (APO) every year which stems out from an

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
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Integrated Regional Office
बेंगलूरु/Bengaluru.

overarching Tiger Conservation Plan (TCP), mandated under Section 38 V of the Wildlife (Protection) Act, 1972. Inter alia, activities such as payment of ex-gratia and compensation, periodic awareness campaigns to sensitize, guide and advise the general populace on man-animal conflict, dissemination of information through various forms of media, procurement of immobilization equipment, drugs, training and capacity building of forest staff to deal with conflict events are generally solicited.

ii. **Restricting habitat interventions**: Based on the carrying capacity of tigers in a tiger reserve, habitat interventions are restricted through an overarching TCP. In case tiger numbers are at carrying capacity levels, it is advised that habitat interventions should be limited so that there is no excessive spillover of wildlife including tigers thereby minimizing man-animal conflict. Further, in buffer areas around tiger reserves, habitat interventions are restricted such that they are sub-optimal vis-à-vis the core/critical tiger habitat areas, judicious enough to facilitate dispersal to other rich habitat areas only.

iii. **Standard Operating Procedure (SOPs):** The National Tiger Conservation Authority has issued following three SOPs to deal with human-animal conflict, which are available in public domain:

a. To deal with emergency arising due to straying of tigers in human dominated landscapes
b. To deal with tiger depredation on livestock
c. For active management towards rehabilitation of tigers from source areas at the landscape level.

14. It is submitted that the three SOPs inter alia include the issue of managing dispersing tigers, managing livestock kills so as to reduce conflict as well as relocating tigers from source areas to areas where density of tiger is low, so that conflict in rich source areas does not occur. Also as per Tiger Conservation Plans

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
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need based and site-specific management interventions are done for improving quality of wildlife habitat for which funding is provided under the ongoing Centrally Sponsored Scheme of Project Tiger.

15. It is submitted that a guideline for Management of Human Elephant Conflict has been issued by the Ministry on 06.10.2017 and elephant range states have been requested for implementation of the same. **A copy of the said guideline has been annexed and placed at Annexure-2.**

16. It is most respectfully submitted that large mammals are usually long-lived, and thus, understanding complex parameters like "ecological carrying capacity" would require longitudinal studies focusing on animal behavior and the demography of the species concerned. The Wildlife Institute of India (WII) has not carried out longitudinal studies on large mammals in Kerala in recent times. However, the following recent interventions by WII are pertinent:

i. **Implementation of MSTrIPES (Monitoring System for Tigers: Intensive Protection and Ecological Status) in Tiger Reserves:** In all the Tiger Reserves of Kerala, MSTrIPES, a novel, state-of- the-art platform used in assisting the frontline forest department personnel in effective patrolling, assessing ecological status, and mitigating human-wildlife conflict is being implemented. MSTrIPES is being jointly implemented by WII, National Tiger Conservation Authority (NTCA) and the Kerala Forest Department.

ii. **Tiger monitoring across the entire state**: Once in four years, systematic population monitoring involving "occupancy surveys" and "population estimation" using robust scientific approaches are being

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सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
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carried out in all potential tiger habitat across the state. Through this effort, the distributional area of tigers along with the population size is estimated. This task is being jointly carried out by WII, NTCA and Kerala Forest Department.

iii. **Mapping human-elephant conflicts in Kerala**: In order to understand the spatial spread of human-elephant conflicts in select states of India, which included Kerala, WII and Project Elephant, Government of India mapped the incidences of human-elephant conflicts at the scale of Forest Range. The data used for mapping pertained to 2016-2020, obtained from the Kerala Forest Department. **A report titled *"Human-Elephant Conflict in Select States of India: A Preliminary Report"* was released during the year 2022 and the same has been annexed as Annexure-3**.

iv. **Mapping sensitive stretches of Railway lines to mitigate rail collision threats to elephants**: Considering the potential threats posed by trains to wildlife in general and elephants in particular, WII and Project Elephant, in collaboration with Kerala Forest Department identified stretches that are vulnerable for elephant-train collisions in Kerala. Important stretches identified included (i) Palakkad – Walayar in Palakkad Forest Division (ii) a small stretch between Wadakkancherry – Mullucara in Thrissur Forest Division, and (iii) Edamann – Ariyankavu in Thenmala Forest Division. The final report is currently being finalized.

v. **Appraisal of conflict situation in Wayanad**: In response to the escalated human-wildlife conflict situation in Wayanad district, MoEFCC constituted a technical committee comprising personnel from WII, including its southern regional centre (SACON), and NTCA to closely assess the situation in the district. The committee visited the

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय
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Integrated Regional Office
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affected sites during February and March 2024 and held detailed discussions with a cross-section of stakeholders including frontline field personnel and officials of the Forest Department, veterinary professionals, and the general public.
**A copy of 'Human Wildlife Conflict in Wayanad District, Kerala and Gudalur District, Tamil Nadu' Site Appraisal Report (13-15 March 2024) has been annexed as Annexure-4.**

Following this, a detailed interstate consultation involving Karnataka, Kerala, and Tamil Nadu Forest Department officials along with NTCA and MoEFCC officials was held at Mudumalai Tiger Reserve in March 2024. During the event, major concerns facing the three states with respect to the management of human- wildlife conflicts were discussed. As a sequel, WII through SACON has submitted a technical proposal titled "Knowledge Management, Technology Intervention and Capacity Development for Human- Wildlife Interface Management for the Southern States of India" to the MoEFCC to holistically assess conflict in the region.

vi. **Assessment of human-wildlife conflict dynamics in Wayanad and Gudalur landscape of the Nilgiri Biosphere Reserve**: In response to escalating human-wildlife conflict situation in the inter-junction of Tamil Nadu and Kerala, which witnesses substantial wildlife movement, a project aimed at holistically understanding fine-scale aspects of human-wildlife conflicts in the region was initiated by WII. As part of the project, 15 years of data on human-wildlife conflicts was collated. Additionally, over 250 interview surveys were carried out in the landscape to generate maps that accurately depict human-wildlife conflict hotspots. Major challenges facing management in addressing such conflicts were identified in the preliminary phase of the project.

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
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vii. **Regional action plan for comprehensive understanding and management of human-elephant conflict in the southern region:** Since the elephant habitats in the southern region (and in other Indian regions too) span across state boundaries, preparing a regional action plan involving the southern states is critical to effectively tackle escalating human-elephant conflicts. Accordingly, a meeting involving the state Forest Departments of Kerala, Karnataka, Tamil Nadu, and Andhra Pradesh was held on 5th September 2024 at Coimbatore, Tamil Nadu. Senior Forest Department officials attended the meeting from all the southern states, which was chaired by the Director General of Forests and Special Secretary, MoEFCC. Several important concerns facing conflict management and approaches to minimize them were discussed during the meeting. It was also decided to prepare a comprehensive regional action plan for the southern region aimed at tackling escalating conflicts. **A copy of approved proceedings of the meeting held on 05.09.2024 has been annexed and placed at Annexure-5.**

17. It is further submitted that during 2023, Project Elephant, MoEF&CC with the technical support of the WII came up with a comprehensive all-India report of elephant corridors titled ***"Elephant Corridors of India: 2023".*** The report listed 150 elephant corridors in 15 Indian states. In the said report, seven corridors were identified in Kerala. The corridors identified in Kerala included (i) Begur-Brahmagiri (via Wayanad) (ii) Kudrakote – Thirunelly (iii) Kottiyur – Periya (iv) Periya –Pannippad (v) Nilambur – Appankappu (vi) Nilambur Kovilakam – New Amarambalam and (vii) Mudumalai – Nilambur via O'Valley. The report also encouraged the states to further identify corridors, as appropriate using a data-driven approach. **A copy of the said report has been placed as Annexure-6.**

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय
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एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
बेंगलूरु/Bengaluru.

18. It is humbly submitted that the answering Respondents are duty-bound and fully committed to the Conservation of flora and fauna of the country. That in light of the aforementioned facts and circumstances it is respectfully prayed that this Hon'ble Tribunal may pass any order as it deems fit.

**DEPONENT**

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
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Integrated Regional Office
बेंगलूरु/Bengaluru.

## VERIFICATION

Verified at Bengaluru on this 12th day of December 2024 that the contents of the above affidavit are true and correct to the best of my knowledge based on records and no part of it is false, and nothing material has been concealed therefrom.

**DEPONENT**

श्री बी. एन. अंजन कुमार
Shri B.N. Anjan Kumar
सहायक वन–महानिरीक्षक(कें)
Assistant Inspector General of Forest (C)
भारत सरकार/Government of India
पर्यावरण वन एवं जलवायु परेवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
एकीकृत क्षेत्रीय कार्यालय
Integrated Regional Office
बेंगलूरु/Bengaluru.

Annexure-1

**F.No. 8-60/2020 WL (Part-1)**
**Government of India**
**Ministry of Environment, Forest and Climate Change Wildlife Division**

**1st Floor, Agni Wing,**
**Indira Paryavaran Bhawan,**
**Jor Bagh Road, Aliganj,**
**New Delhi – 110003.**
**Date: 6th February, 2021**

**To**
**Chief Wild Life Warden**
**All State/UTs**

Sir/Madam,

**Sub: Advisory to deal with Human Wildlife Conflicts – reg.**

The Standing Committee of the National Board for Wild Life has recommended an Advisory to deal with the Human Wildlife Conflicts in the 60th meeting held on 5th January, 2021.

The Advisory to deal with the Human Wildlife Conflicts is enclosed herewith for information and necessary action.

Yours faithfully,

**Enclosure**: As above

**Rakesh Kumar Jagenia,**
Deputy inspector General of Forests (Wildlife)
Email: digwl-mefcc@gov.in

**Copy to:**
1. The Principal Secretary (Forest), All States/UTs
2. The Principal Chief Conservator of Forests & Head of Forest Force. All States/UTs

**Copy also to**
1. Sr. PPS to DGF & SS/PSO to ADGF (WL)/PPS to IGF (WL)/PS to JD (WL

Signature Not Verified

Digitally signed by RAKESH KUMAR JAGENIA
Date: 2021.02.06 06:17:15 IST

F. No. 8-60/2020 WL

**Government of India**

**Ministry of Environment, Forests and Climate Change**

**(Wildlife Division)**

***

New Delhi, Dated 6th February, 2021

## Background

As per the Constitution of India, it is the duty of every citizen to protect wildlife. The Government is fully committed to protection of wildlife and has put in place institutional and organizational measures to strengthen the protection regime. Yet, incidences of negative interaction have been reported from time to time where wild animals including large mammals such as Nilgai (blue–bull), wild pig, elephant, tiger, leopard, bear etc. that are protected under the schedules of Wild Life (Protection) Act 1972, are involved. Human wildlife negative interaction many a time results in death/injury/permanent incapacitation of human beings/domestic animals/livestock due to attack by wild animals or loss of crops and property.

Therefore, the need for a separate advisory in this regard**.** The advisory has been recommended by the Standing Committee of the National Board for Wild Life in its 60th meeting held on 5.1.2021 as per Section 5C(2)(a) of the Wild Life (Protection) Act 1972.

## The Advisory

### *Preamble*

Recognising that the factors leading to Human Wildlife Conflict and associated death/injury to humans lives and or crops/scheduled animals, and their remedial measures often concern several departments of the State Governments/ UT Administration, this Advisory seeks expedited inter-departmental coordinated and effective action by State Governments/ UT Administrations on preventing and dealing with Human Wildlife Conflict (HWC) and associated death/injury/permanent incapacitation of human beings/domestic animals/livestock due to attack by wild animals or loss of crops and property and also accidental deaths of wild animals listed in Schedule I to IV of Wild Life (Protection) Act 1972..

### *Objectives*

The following objectives are sought to be achieved:

i. Improvement in wildlife habitat of such wild animals under Schedule I to IV of Wild Life (Protection) Act 1972 (hereinafter referred to as wild animals) that are commonly involved in HWC by leveraging resources from different departments of the government, so as to provide adequate food and water inside forests and minimise venturing of those wild animals outside forests;

ii. Ensuring safe passage of wild animals along their scientifically-identified movement routes or corridors outside forests, including improvement of habitat conditions in and along those routes;

iii. Creation of locally suitable biological barriers on and along the forest-fringe farms, including alteration of crop patterns, under schemes of different departments to deter wild animals from raiding private farms/ villages;

iv. Ensuring adequate and timely payment of ex-gratia to the persons affected by HWC; and

v. Creating an intelligent and effective system based on local intelligence and people's participation for preventing wildlife crimes, including killings of wild animals outside forests and trade/ consumption of animal parts, and prosecution of offenders.

***Measures***

In order to prevent and manage Human Wildlife Conflict, and mitigate the risks and adverse impacts associated with it, including killing of wild animals, the States/UTs should adopt the following measures:

A. **MANAGEMENT MEASURES:**

1. **Inter-departmental Coordination Committees:**

Prevention and management of HWC and associated death/ killing of wild animals concerns several government departments, and, therefore, close coordination is required for timely and adequate action. Coordination committees at the State/ UT and district levels should be constituted as follows within three months of issue of this Advisory:

a. *Co-ordination committee at the State/UTs level (SLCC):*

i. State Governments/ UT Administrations of the affected States/ UTs should constitute a State Co-ordination Committee (SLCC) headed by the Chief Secretary with membership of Secretary in-charge of finance, natural resources, infrastructure, home and forest departments of State/ UT, Director General of Police, PCCF-HoFF and representatives of concerned Central Government departments (Railways, Revenue Intelligence, Customs, etc.). The Chief Wild Life Warden is to act as the member secretary of this committee.

ii. The committee would meet as many times as necessary, but no later than six months of the previous meeting.

iii. Functions of the SLCC:

- In furtherance of the objectives of this Advisory, review the required infrastructure, manpower and monitoring systems in the State/ UT, and take necessary measures to strengthen the same;
- Monitor the number of HWC cases and their geographical spread, and provide guidance/ instructions to different departments for action to be taken by each one of them in order to minimise/ prevent HWC in those areas;
- Review the quantum of ex-gratia relief, issue guidance/ instructions for expedited payments, and work towards providing adequate funds for the same;

- Review the cases of revenge killings of wild animals and other wildlife related crime, and issue necessary guidance/ instructions to the concerned departments/ agencies as appropriate; and
- Recommend to State Wildlife Board and / or the Government, policy and programmatic measures, including for capacity building, required for fulfilling the objectives of this Advisory.

b. *District Co-ordination Committee (DLCC):*

i. On the recommendation of Chief Wild Life Warden (CWLW), the State Government/ UT Administration should constitute an inter-departmental coordination committee in all or identified district(s) of the State/ UT that are vulnerable to HWC to be chaired by District Collector, and comprising of district-level officers of departments/ organisations included in the SLCC. The Wild Life Warden of the District headquarter is to act as Member Secretary.

ii. The Committee may also include an Honorary Wild Life Warden residing in the district and up to two non-official expert members on the recommendation of the Member Secretary.

iii. The Committee may invite an official from any other department/ organisation or an expert from a reputed State/ national level institute as special or standing invitee to meetings of the Committee.

iv. The Committee should meet as often as required but no later than three months of the last meeting.

v. Functions of the DLCC:

- The DLCC would ensure coordinated action by different departments of the government to prevent killing/ injuring/ illegal capturing of wild animals by snaring, use of explosives, poisoning, electrocution, etc. in areas outside forests, and if requested so by the Wild Life Warden, in forest areas also.
- The DLCC would also ensure coordinated action by different Departments for expeditious payment of ex-gratia to persons affected by HWC.
- The DLCC may seek assistance of Wildlife Crime Control Bureau (WCCB) or other expert organisations in capacity building for intelligence gathering, investigation and prosecution for prevention and dealing with wildlife crime.

2. **Identification of Hotspots**

i. The hotspots where human death/ injury or damage to property by wild animals is occurring on a regular basis or death/ injury to wild animals is being caused by use of explosives, snares, traps, poisoning, electrocution or by any other means, may be identified and record of the same should be continuously updated by the concerned Wild Life Warden. A State level inventory of such Hotspots will be maintained, updated and used for planning for reducing Human Wildlife Conflict. The inventory should preferably be hosted on a secure GIS-based MIS platform under the direct supervision of Chief Wild Life Warden, and nodes of the platform may be available to the Wild Life Wardens.

ii. For the purpose of identification of hotspots, simple mobile-based applications may be developed/used to for collation of geo-referenced HWC data.

3. **Joint Patrolling of Hotspots:**

Whenever solicited by the Wild Life Warden (Divisional Forest Officer) assistance from departments like Police, Revenue, Electricity, Irrigation, PWD, local community representatives etc. shall be provided for joint patrolling and combing operations in and around the hotspot areas or any other area where such operation is deemed necessary.

4. **Adherence to Standard Operating Procedures (SOP) and Guidelines**

The Ministry of Environment Forest and Climate Change, Govt. of India and authorities under it have been issuing SOPs and guidelines to deal with various aspects of HWC which have to be followed while dealing with HWC incidences.

5. **Establishment of Rapid Response Teams (RRT):**

i. States should establish Rapid Response Teams (RRT) for quick action and management of conflict situations, especially in the hotspot areas. The RRTs should include trained staff with technical knowledge, be well equipped with materials as per local needs. The DLCC should facilitate the involvement and contribution of related departments in the district for establishment of RRTs. The Chief Wild Life Warden will make assessment of RRTs at regular intervals, including men and materials to be made available to RRTs, and take necessary steps for their timely procurement with the help of DLCC.

ii. Depending up on the severity of HWC, States may establish dedicated circle wise Control Rooms with Public helpline/Toll **free hotline numbers** which could operate on a 24x7 basis.

6. **Provision of financial resources for HWC**

It is to underline that HWC, if not attended properly, may acquire serious proportions, endangering both human life/property and the wildlife. Therefore, each State Government shall endeavour to provide adequate budgetary resources for dealing with HWC, and in particular for Early Warning Systems (EWS), RRT, ex-gratia payment and awareness generation. Measures like establishment of Revolving Fund at the level of Divisional Forest Officer help in timely availability of financial resources for dealing with HWC and expedited payment of ex-gratia.

7. **People's participation in managing HWC**

Local people should be involved in dealing with HWC particularly in the hotspot areas, by formation of teams at village or a group of village level comprising of members of Joint Forest Management Committee (JFMC), Eco-development Committee (EDC), Watershed Committee (WC), etc. to ensure timely communication, coordination and immediate management of HWC. Basic equipment, communication tools and training should be provided to these teams. The State/ UT may also consider providing 'contingency funds' to JFMCs/ EDCs for dealing with contingent expenses in cases of emergency.

8. **Dealing with Law and order situation in HWC cases**

It is often seen that in HWC situations, dealing with a large number of people who quickly gather at one place to view wild animals or to prevent them from entering their farms/ habitation, becomes a challenging task that hampers safe passage of wild animals or rescue work. State Governments/ UT Administrations may review the situation devise administrative mechanisms to ensure efficient coordination and cooperation of the law enforcing agencies at such situations to ensure smooth handling of such situations.

9. **Adoption of Early Warning Systems (EWS):**

The States should endeavour to develop and establish Early Warning Systems (EWS) to manage HWC. This may include:

i. Seismic waves/IOS Mobile Technology, infrared technology, temperature and movement sensors, in alerting the movement of large herbivores like elephants in and around most vulnerable villages;

ii. Drones and other systems for tracking movement of wildlife herd in and around Hot-Spot areas such as radio/satellite collars.

iii. Warning alerts to local leaders /officials/villagers through SMS or through FM Radio/community radio/local TV, etc.

10. **Developing ecologically sustainable linear infrastructure:**

The guidelines issued by Ministry of Environment, Forest and Climate Change on "Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife" should be followed, and timely creation of Underpasses, overpasses, etc. that facilitate the movement of wildlife in a timely manner by the infrastructure agencies should be monitored and ensured at highest level.

11. **Adoption of traditional/common management practices:**

*i. Creation of barriers*:

Barriers that prevents easy movement of wildlife from forest area to human habitations may be considered in certain cases after thorough evaluation about their necessity and effectiveness. These could in the form of:

- Trenches (especially for Elephants)
- Solar-powered electric fences
- Rubble walls
- Other types of fences made from steel channels, rail, wire guide ropes, bars etc

ii. *Promotion of appropriate agri-horticulture/ agroforestry around wildlife rich areas that repel wild animal:*

It is well known that wild animals get attracted to palatable and nutritious crops grown on crop fields around forest areas. This leads to damage of crops and financial loss and hardship to the farmers who are often poor people from the tribal communities. The concerned departments should promote crops in these fringe areas

which are unpalatable to wild animals. Farming or agroforestry models may include cash crops like chillies, lemon grass, *khus* grass etc. suitably mixed with appropriate tree/ shrub species. A comprehensive long-term plan for alternate cropping should be prepared and implemented by the State Agriculture/ Horticulture department under different schemes in such vulnerable areas.

*iii. Augmenting fodder and drinking water in forest areas*:

Improving wildlife habitat by management of invasive species, augmenting fodder species and provisioning water for wild animals in lean periods is the key to minimizing HWC, and, therefore, this should be undertaken extensively. Desilting of existing water holes should also be taken on priority basis. All wildlife rich areas and wildlife corridors in and around the Hotspots should be treated on priority. The SLCC and DLCC should review the progress and facilitate mobilisation of necessary resources available in different departments/ organisations for this purpose.

*iv Improvement of local livestock*

Free ranging livestock becomes more vulnerable to killing by wild animals. The Animal Husbandry department should formulate and implement special plans for improved stall-fed farm animal stock and practices, especially in the Hotspot areas. This will also reduce grazing pressure on native wildlife habitats and improve local economy.

**12. Dealing with Wildlife Crime**:

i. Each State/UT should establish a State-level forest and wildlife crime intelligence units/ cells to facilitate collection of information from locals and other informers regarding forest and wildlife crime, including with the help of the existing Police Intelligence network. The Cell should regularly coordinate with WCCB and other neighbouring states.

ii. The States/UTs should develop a mechanism of rewarding informers for intelligence gathering regarding wildlife crimes. The States/UTs may also issue necessary guidelines/notifications as per the provisions contained in the Wild Life (Protection) Act, 1972 to reward persons who render assistance in detection of offences and apprehension and trial of the offenders, and may also consider establishing Secret Fund at the disposal of Wild Life authorities of the State/UT at the appropriate level on the lines of Secret Fund operated by the State Police Department.

iii. DLCC should oversee that regular patrolling of vulnerable local markets and food joints is being organised and effective action is being taken against the offenders.

iv. Capacity building of frontline staff for investigation, forensics and successful prosecution of wildlife cases should be organised at regular interval.

v. Sensitization and awareness drives involving JFMCs/ EDCs/ WCs through print & visual media in local language should be organised regularly. The DLCC and SLCC may oversee that the Public Relation Dept of the Govt. remains actively involved.

**13. Dealing with problem animals**

Providing safe passage to the wild animals involved in HWC in human habitations should be the topmost priority, and local administration should ensure better crowd management. If everything else fails, capture and translocation using scientific methods may be resorted with the approval of Chief Wild Life Warden.

**14. Involving Gram Panchayats:**

Considering the role Gram Panchayats play in community development and conservation of natural resources, the State Chief Wild Life Wardens may utilise the Panchayati Raj Institutions and authorize the *Sarpanch* or any other representative of Gram Panchayat for dealing with problematic wild animals under Section 11(1) (b) of Wild Life (Protection) Act, 1972 .

**B. FINANCIAL MEASURES:**

1. **Ex-gratia relief:**

   i. SLCC should review the rate of *ex-gratia* relief at regular intervals with a view to ensure that it is effective both in providing necessary support to the victim and to prevent revengeful action by vulnerable/ affected population. The rates of adjoining States and that of Central Government under various Centrally Sponsored Schemes, whichever is higher, should guide the review.

   ii. A suitable portion of ex-gratia relief should be paid within 24 hours to the affected persons in the case of death and injury to persons.

   iii. SLCC and DLCC should regularly review that ex-gratia, including immediate relief within 24 hours, is being paid in a timely manner, and for this purpose necessary reports/ documents are being made available by police, revenue and medical authorities to the local Range Officer of Forests expeditiously on priority. State Governments may establish a robust procedure with specific timelines for this purpose. Revolving Fund may be established with local Divisional Forest officer for quick payment of ex-gratia and other expenses in dealing with HWC.

2. **Crop Insurance:**

The State/UT Governments may also utilise the *Pradhan Mantri Fasal Bima Yojana* which provides add-on coverage. With a view to provide an add-on welfare to the farmers, the Ministry of Agriculture and Farmers Welfare has included insurance coverage for crop loss due to attack by wild animals, under the *Pradham Mantri fasal Bima Yojana*. This insurance programme would help farmers as means of compensation for their crops that have been damaged due to wild animal attacks.

**The Operational Guidelines of the *Pradahan Mantri Fasal Bima Yojana* may kindly be seen at the following link:**

**https://pmfby.gov.in/pdf/Revised_Operational_Guidelines.pdf**

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Annexure-2

F. No. 14-1/2016-PE
Government of India
Ministry of Environment, Forests and Climate Change
Project Elephant Division

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

Dated 6th October, 2017

To,

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

**Sub: Guidelines for Management of Human Elephant Conflcits.**

Sir,

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

Yours faithfully,

6.10.2017.

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

Encls: As above.

Copy forwarded for information and necessary action to:

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

# Guidelines for Management of Human Elephant Conflicts

## INTRODUCTION

## 1. Definitions

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

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

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

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

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

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

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

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

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

## 2. Background

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

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

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

The main types of HEC are:

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

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

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

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

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

## 3. Factors Influencing Intensity of HEC

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

## 4. Organization of these guidelines

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

## OVERVIEW OF CURRENT HEC MANAGEMENT PRACTICES

## 5. Installation of Barriers

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

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

There are different strategies to install barriers.

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

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

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

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

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

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

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

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

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

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

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

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

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

## 6. Anti Depredation Squads (ADS)

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

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

## 7. Elephant Drives

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

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

## 8. Kunki Elephants

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

## 9. Commonly used repellent methods

A variety of local repellant methods are used by farmers.

<u>Loud noises and crackers</u>

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

<u>Other repellent methods</u>

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

## 10. New repellent methods

Bee sound

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

Carnivore sounds

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

Drones

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

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

## 11. Deterrent Methods

Trip alarm

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

Sensor based alarm system

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

Night Guarding

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

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

Chilli-based methods

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

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

Beehive fences

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

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

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

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

## 12. Community Based Conflict Management (CBCM)

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

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

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

Logic of CBCM

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

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

## 13. Ex-gratia payment

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

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

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

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

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

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

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

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

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

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

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

## PROPOSED STRATEGY

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

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

## 14. Community Involvement and Empowerment in HEC management

14.1 Advantages of community involvement in managing HEC

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

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

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

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

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

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

14.2 Hierarchy of HEC mitigation measures

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

Avoid > Minimize > Restore

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

Deterrent measures > Early warning systems > Repellent measures > Compensation

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

14.3 Strengthening capacity of communities

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

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

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

14.4 CBCM techniques

Deterrent techniques

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

Early warning techniques

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

Bulk SMS alerts

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

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

Repellant techniques

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

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

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

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

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

14.5 Dissemination

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

## 15. Implementation of Barriers

15.1 General guidelines on barriers

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

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

15.2 Barriers on forest boundary

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

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

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

Barriers on forest boundary, if created, should be used only as a local measure for controlling local HEC. Barriers should never be created around the entire forest

block if this is small, because this will confine the elephant population and compromise their long term genetic viability.

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

15.3 Types of barriers

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

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

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

## 16. Anti-depredation squads (ADS)

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

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

ADS should be composed of trained staff with technical knowledge of elephant behaviour and elephant management techniques. ADS should work in a planned manner. At the beginning of every season training sessions should be conducted for

ADS. Trial runs and mock operations should be carried out before the main HEC season. Senior forest officers should take interest in operation of ADS and should participate in some ADS operations. Coordination between territorial and wildlife divisions supervised by a senior forest officer is very important for effective functioning of ADS.

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

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

## 17. Compensation (Ex-Gratia Payment)

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

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

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

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

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

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

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

## 18. Crop Insurance

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

## 19. Elephant Drives

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

## 20. Early warning SMS alert systems/WhatsApp Group

Systems based on laser beams have been used on Valparai Plateau in Nilgiri Hills, Tamil Nadu to provide early warning of elephant arrival. A system of sending SMS alerts of elephant presence has been developed to warn of elephant presence. A system of pulsating warning lights on towers that warns of elephant presence in the area has been developed. These methods are useful in reducing incidents of human mortality due to encounter with elephants. These methods are useful in situations where encounters with elephants are high. Warning about elephant presence may also be advertised through local/ cable TV channels. They should be implemented in other areas where similar situation exists.

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

## 21. Primary Response Teams & Rapid Response Teams

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

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

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

## 22. Minimizing Human Encounters with Elephants

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

In some regions for e.g. Valparai encounters with elephants often take place in low light conditions when people bump into elephants accidentally when returning from work in the evening or going for work in early morning. A large number of cases of human deaths / injuries in the country involve people who trespass into elephant habitats or indulge in collection of timber, firewood, fodder, tendu leaves, mahua and other NTFPs. The villagers visiting forests for attending nature's call often fall victims to elephants. Elephants are also known to be attracted by country liquor stored in houses. The possibility of fatal encounters is higher when the person is alone. Knowledge of these factors can help to prevent such encounters.

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

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

## 23. Capture and relocation of elephants

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

There may be no other option but to capture these elephants. The question then arises as to what should be the course of action after capture; should the elephants be released back into a forest or should they be retained in captivity. The first option is obviously the more desirable one when this is feasible. If a state has forests suitable for relocation, the option of releasing the elephants there should be first examined. There are indications that subadult or young adult bull elephants of the age of emigrating from their natal families are likely to settle down in another forest area through such "assisted dispersal". However, it should be emphasized that there is no foolproof guarantee of success in relocating elephants that have been in conflict with people. This is a learning process in elephant management. In the past, most experiments in capturing and relocating adult male elephants have failed with

the bulls going back to their original place of capture. Relocated elephants should be fitted with GPS-based collars to monitor their movement with the option of recapturing them in case they again come into conflict. The site of release should be at sufficient distance (typically of the order of 200-300 km or greater) such that it is unlikely that the elephant would be familiar with the new site and attempt to go back to the place of capture. “Soft release” options can also be experimented with; this would involve keeping the animal in a stockade for some limited time period at the proposed site of release before letting it free.

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

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

## 24. Reducing Retaliatory Killing of Elephants

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

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

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

## 25. Seasonal Planning for HEC Management

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

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

## 26. Documentation of local knowledge

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

## 27. Mob Control

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

## 28. Managing Private and Temple Elephants

There are several instances of private elephants and temple elephants getting scared and going out of control, often during processions, due to loud music, crackers and presence of large crowd, etc. As far as possible, elephants should be kept away from congested places and large crowds. Assembly of elephants in temples or other public places should not be permitted unless the organizers have taken adequate measures to deal with any emergency. It should be ensured that the elephants, particularly bulls, participating in public functions are manned only by trained and experienced

mahouts. A dossier should be maintained of all elephants which have the history of being ill-tempered. Standard operating Procedures (SoPs) should drafted for tackling such situations. Rapid response teams should be formed by the Forest Department in big cities to tackle such situations.

Captive elephant welfare committees should be constituted at State and District levels to ensure welfare and humane treatment of captive elephants, particularly in private custody. Chief Wildlife Wardens should periodically monitor ownership certificates/ microchips of elephants. The implementation of the guidelines for welfare and management of captive elephants, issued by the Ministry on 8.01.2008, should be enforced in letter and spirit. The Ministry has also issued on 29.09.2017 standards/ norms for giving recognition to elephant housing facilities for captive elephants, including temple elephants.

## 29. Managing Transboundary Elephant Movement

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

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

Sympathy is needed by forest officers and people on both sides of the boundary. Strong communication should be established between forest officers on both sides to ensure that no harm comes to elephants. Elephants should be allowed to follow their natural migratory paths. Preparations should be carried out to ensure that there is minimum damage and hardship to people during their stay on the other side

of the boundary. The recommended strategy in such cases should be to prevent the movement of elephants to undesirable areas with the help of suitable barriers and to translocate / capture the straying elephants. The more experienced and knowledgeable partner should share their knowledge of elephant management and, if necessary, conduct training session for the partner on the other side of the boundary to help in managing HEC. Such dialogue should continue throughout the HEC season.

Elephants are known to be expanding their range to non-elephant districts of Northern Andhra Pradesh, Chhattisgarh, Bihar, MP, Maharashtra and Goa. Similarly, suitable elephant habitats no longer exist in parts of Nepal adjoining North Bengal and parts of Bangladesh adjoining Garo Hills (Meghalaya). The recommended strategy in such cases should be to check the movement of elephants to undesirable areas with the help of suitable barriers and to translocate / capture the straying elephants.

## 30. Rescue and Rehabilitation Centers

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

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

## 31. Training of Mahouts and Kawadis

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

## 32. Humane Treatment of Elephants

Though elephants have to be kept away from human use areas the techniques used should be humane and should not cause harm or suffering to elephants. This is especially true in case of some harsh techniques used by anti-depredation squads

and frontline staff during elephant drives. Communities also need to be educated about humane treatment of elephants.

## 33. Attitudinal Change

A campaign for creating awareness of elephant needs to be instituted. The Elephant Task Force has also recommended a campaign named *Hathi Mere Sathi* for this purpose. Communities also need to be educated to take responsibility in managing HEC. The community should be educated about habitat fragmentation due to encroachments and it role in increasing HEC. There is also a need to extend educational and awareness programmes for the development agencies, railways, power, irrigation,, highways, mining companies, tourism industry, district administration, etc.

## 34. Communication

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

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

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

Figure 1

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

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

Communication channels between the community and Forest Department should remain open at all times to ensure good management of HEC. The community should be informed contact numbers of the local member of frontline staff in case of arrival

of elephants or crop damage. SFDs also need to set up a grievance redressal system for communities and the frontline staff.

## 35. Training of frontline staff and farmers

Training goes hand in hand with communication. Frontline staff as well as community should be trained in techniques for management of HEC. At present the most commonly used techniques are noise making techniques followed by drives. The stakeholders should be educated in alternative techniques for deterrent measures, early warning systems and effective repellent techniques. The training program should be coordinated by the State Director, Project Elephant.

## 36. Research and Development

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

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

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

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

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

There is lot of data being maintained by SFD on conflict but not effectively used except for ex-gratia support. There is no systematic analysis of the data at landscape

level to understand the pattern and level of conflict and to predict the overall trend and places of conflict hotspots based on which mitigation measures could be planned and adapted. The information could also be analyzed based on LULC the landscape to understand the main drivers of conflict and plan accordingly.

## 37. Assessment of HEC zone

A data base has to be maintained by each state for effective assessment of damage and compensation. But the data has to be also analyzed extensively to understand the pattern of conflict, trends and identify conflict hotspots to predict the trend and places of conflict based on which mitigation measures could be planned and adapted.

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

## 38. Implementers of guideline/Involvement of Stakeholders

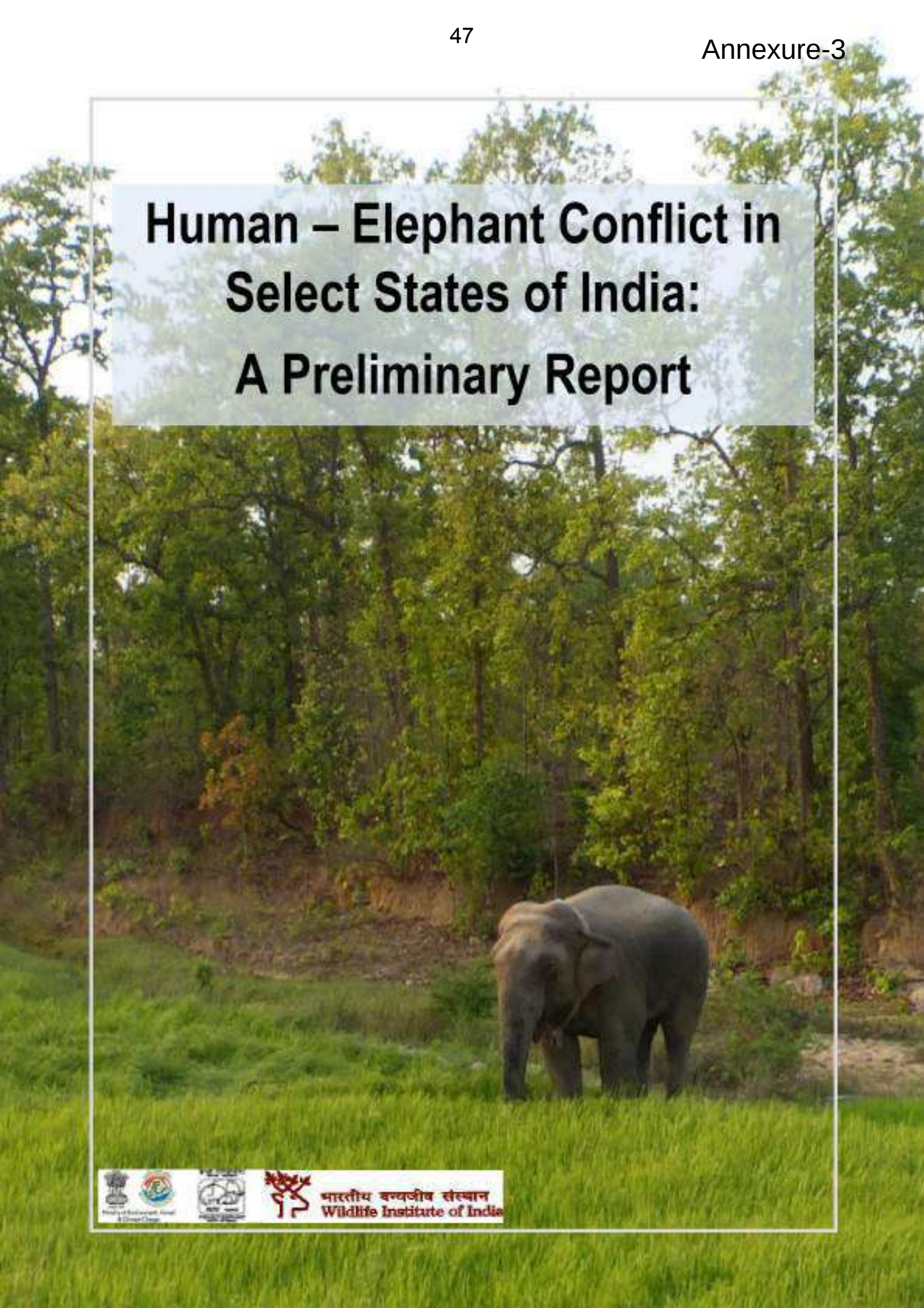
Multiple stakeholders like MoEFCC; Ministry of Agriculture (including Department of Animal Husbandry), Ministry of External Affairs (MEA); Research Institutes; State Departments of Finance, Agriculture, Animal Husbandry and Health; District Administration; Local Bodies; Police; linear developmental agencies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

## 39. Enrichment of deemed forest:

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

Annexure-3

# Human – Elephant Conflict in Select States of India: A Preliminary Report



भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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# Human - Elephant Conflict in Select States of India: A Preliminary report

**Team**

Dr. S.P. Yadav, IFS, Director, WII
Sh. Ramesh Pandey, IGF & Director, Project Elephant
Dr. Parag Nigam, Scientist F & Nodal Officer, Elephant Cell, WII
Dr. Bilal Habib, Scientist E & Ass. Nodal Officer, Elephant Cell, WII
Dr. K.M. Selvan, Scientist D, Project Elephant Division
Dr. Panna Lal, Principal Technical Officer, IT and RS & GIS Cell, WII
Dr. Prajna P Panda, National Coordinator, Elephant Cell
Sh. Lakshminarayanan N, Project Scientist, Elephant Cell, WII
Sh. Udhayaraj AD, GIS Specialist, Elephant Cell, WII

## Foreword

Among the 13 Asian elephant range countries, India holds the largest population of elephants despite being a populous country with continuously growing economy. This demonstrates India's commitment towards elephant conservation. The cultural ethos, affinity towards nature, strong conservation laws, focused management, supportive and law abiding civil society are the main enablers of elephant conservation in particular and wildlife conservation in general. Elephant conservation challenges are also manifold as elephants are truly landscape species that requires large natural areas, which is not easy to set side in India. Among the challenges facing elephant conservation, human-elephant conflict is overriding. The human-elephant conflict appears to be on the rise. The consequences of Human–Elephant Conflict are not only of key conservation concern but are also resulting in major socio-economic and political issues. Therefore, efforts to resolve Human–Elephant Conflict assume a greater priority in India. From human perspective, the most common forms of HEC include loss of crops, property and human lives. From the perspective of elephants, the most common form of conflict is mortality of elephants due to conflict-related reasons. The situation calls for concentrated efforts by involving all stakeholders with a clearly spelt out direction that transcends across the state boundaries. The Elephant Cell at Wildlife Institute of India established by Project Elephant Division had taken up a very critical task of collating existing data on human-elephant conflict to create a central database that can be readily accessed by a variety of stakeholders. The assignment is ongoing with information being received from different State Forest Departments. I am hoping that the centralized database would help in prioritizing conflict mitigation strategies in the country to secure both local livelihoods and elephant populations.

Dr. S.P. Yadav, IFS
Director, WII

## Foreword

One of the stated objectives of the Project Elephant of the Ministry of Environment, Forests and Climate Change is resolution of human-elephant conflict in India. Thus, the Project Elephant is in the forefront of prioritizing conflict mitigation strategies in collaboration with the state forest departments. Human-elephant conflict is a complex two-way interaction between people and elephants over shared resources. The phenomenon of human-elephant conflict is ancient with crop raiding by elephants being recorded almost 12000 years ago when human beings started settled agriculture. Unlike many other elephant range countries in both Africa and Asia where local tolerance levels are low prompting intrusive conflict mitigation strategies, elephants in India are deeply venerated as cultural icons and celebrated as national heritage animal. Thus, tolerance to elephant conflict in India is relatively high. Furthering this tolerance with an objective of achieving harmonious coexistence by safeguarding local livelihood through proactive strategies would be crucial for elephant conservation in India. Mitigating conflict between people and elephants proves to be far from easy due to challenges posed by developmental activities like urbanization, deforestation, and mining along with competition for local resource needs. As a step towards data-driven prioritization of conflict mitigation, the Elephant Cell of the Project Elephant Division and Wildlife Institute of India has embarked on collating human-elephant conflict data to make available a comparable, centralized data source. In the first phase, data on human-elephant conflict has been collated from seven states namely Andhra Pradesh, Karnataka, Kerala, Odisha, West Bengal, Chhattisgarh, and Nagaland duly processed and presented in a ready-reference format. I hope that the data from other elephant ranging states will be collated in due course and we will soon have a central database on human-elephant conflict for wildlife managers and policy makers to readily refer.

Sh. Ramesh Kumar Pandey, IFS
IGF & Director, PE

# Acknowledgement

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**State Forest Departments**

Forest Department, Government of Andhra Pradesh

Forest & Climate Change Department, Government of Chhattisgarh

Karnataka Forest Department, Government of Karnataka

Kerala Forests & Wildlife Department, Government of Kerala

Department of Environment, Forests & Climate Change, Government of Nagaland

Odisha State Forest Department, Government of Odisha

West Bengal Forest Department, Government of West Bengal

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# CHAPTER I
# Introduction

## Introduction

India holds the largest Asian elephant population in the world with about 30,000 elephants occurring in ca 1,50,000 km$^2$ of land-area, which constitutes less than 4% of the country's total extent of land. Elephants are typically long-ranging animals and distributed across landscapes covering different states in India. Owing to their diverse and large range of habitats, elephants contribute to the protection of biodiversity within their range. Their ecological significance makes them a keystone and flagship species while their cultural importance and religious links attribute them as companion and revered species. India has listed the Asian elephant in Schedule I of the Wildlife Protection Act (1972) as well as designated the species as the National Heritage Icon. A majority of them spread across 31 ERs, covering 11 elephant landscapes in four distinct regions 1) North Eastern region 2) East Central region 3) Northern region 4) Southern region across 23 states, connected regionally by at least 101 corridors as of 2017.

Since the 4% of the elephant distributional range occurs in the midst of human-use areas, human–elephant conflict in myriad forms and varying intensities occurs in the interface areas, and sometimes beyond as well. Expansion of human settlements and agricultural fields across the country has resulted in widespread loss of elephant habitat, degraded forage, reduced landscape connectivity, and a significant decline in elephant populations relative to their historical size and overall range.

As their habitats shrink, elephants are progressively forced into closer contact with people, resulting in more frequent and severe conflict over space and resources with consequences ranging from crop raiding to reciprocal loss of life. Human–elephant conflict involves a two-way interaction between elephants and people with potential negative consequences. As human–conflict can pose a serious threat to local livelihood, which in turn can erode support for elephant conservation, minimizing human–elephant conflict is crucial.

In spite of multi-pronged efforts, conflict between elephants and people seems to be intensifying. There is now an increased recognition that conflict resolution cannot be a one-off effort, but a continuous and sustained endeavor of learning and implementing different strategies over longer period of time. Although human–elephant conflict is one of the most well researched topics in both conservation biology and management in India; many questions beg satisfactory answers so as to devise lasting solutions to the problem. There are also new challenges like elephant dispersal into human-dominated areas; rapid land-use transformation around elephant habitats, and sustained economic and infrastructure development-related pressures that fragment, isolate and degrade elephant habitats and consequently resulting in human-elephant conflict. The spatial relationship between elephants, people and associated socio-economic factors influences the occurrence and severity of human–elephant conflict. Nearly 2,381 people and 490 elephants have died in India from 2015 to 2018 (MoEF&CC, 2018) and between 2000 and 2010, 0.5 million households have suffered annual losses due to crop raiding by elephants (MoEF, 2010, 2012)

Holistic approach to managing HEC calls for site-specific knowledge generation and priority setting as general patterns of conflict is minimal and site-specific variations remain significant. Thus, developing

reliable and easily accessible database on conflict that captures the spatio-temporal variation in the intensity would be invaluable for making informed decisions pertaining to HEC management. In this regard, advancement in the fields of remote sensing and geographical information systems (GIS) provide a basis for mapping HEC so as to capture its variations. Understanding HEC spatial patterns will ensure targeted mitigation efforts and efficient resource allocation to high-risk regions.

Providing technical guidance on HEC resolution to the elephant range states is one of the main stated objectives of the Project Elephant, MoEF&CC, Government of India. Accordingly, with an objective of making HEC database readily assessable for policy makers and field managers, Project Elephant Division along with the Elephant Cell of Wildlife Institute of India embarked on the task of mapping HEC across the entire country. In this report, preliminary details on HEC pertaining to seven elephant range states of India have been pictorially depicted and broad trends presented.

# Chapter – II

# Methodology and Scope of the Report

## Scope of the report

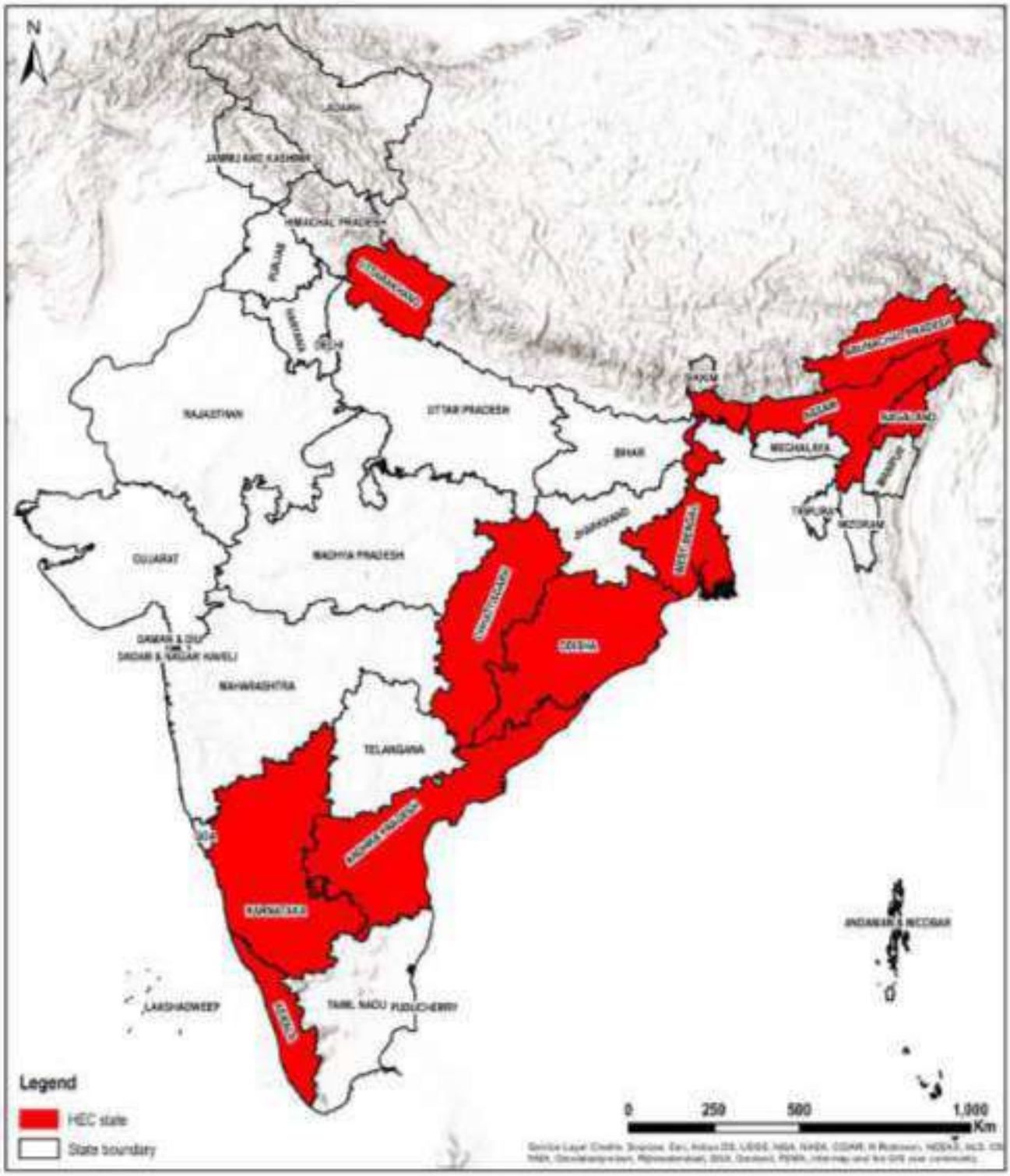
The HEC occurs in myriad forms affecting both people and elephants. From human perspective, the most common forms of HEC include loss of crops, property and human lives. From the perspective of elephants, the most common form of conflict is mortality of elephants due to conflict-related reasons. Thus, the task of mapping HEC attempts to cover the aforementioned forms of conflict, wherever data was available. The data used for mapping HEC was obtained directly from the respective Forest Departments of the elephant range States. In the first phase of HEC mapping, data obtained from 10 states namely Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Odisha, West Bengal, Chhattisgarh, Uttarakhand and Nagaland. The period of data pertains to 2017-2020 for most part. The spatial spread of HEC had been depicted in the maps and broad temporal trends were provided as well. The intensity of conflict is presented at the range level and in case of WB and Nagaland the details were presented at the village and district level. The mapping has been done at a course scale – at the level of administrative ranges as the objective of the report is to provided state level overview of HEC.

**Table 1 Details of the data used for mapping hotspots of HEC**

| State | Scale and year of the data received from FDs | | | | |
|---|---|---|---|---|---|
| | Crop damage | Property damage | Human fatality/Causality | Elephant mortality | Scale used for mapping |
| Karnataka | Village level 2014-2015, 2018-2021 | Village level 2018-2021 | Village level 2019-2021 | Range level 2016-21 | Range level |
| Kerala | - | Range level 2014-2020 | Village level 2015-2020 | Village/beat level 2015-20 | Range level |
| Nagaland | Village level 2016-2020 | - | Village level 2017-2018 | Village level 2018-21 | District level |
| Odisha | - | - | Village/beat level 2017-2020 | Village/beat level 2017-20 | Range level |
| West Bengal | - | - | Village/beat level 2017-2020 | Village/beat level 2017-19 | Village level |
| Chhattisgarh | Village/beat level 2017-2020 | Village/beat level 2017-2020 | Village/beat level 2017-2020 | Village/beat level 2017-20 | Range level |
| Andhra Pradesh | - | - | Village/beat level 2017-2020 | Village/beat level 2017-20 | Range level |
| Arunachal Pradesh | Village level 2015-2019 | Village level 2015-2020 | Village level 2016-2020 | - | Division level |
| Assam | Division level 2016-2020 | Division level 2016-2020 | Division level 2016-2020 | - | Division level |
| Uttarakhand | - | - | Village level 2015-2020 | Range level 2015-2020 | Range level |

## Analytical approach

**Data processing:** The HEC data received from various state forest departments had variations both with respect to time periods (pertaining to different years) and spatial unit of measurement (which varied from beat, range and district levels) (TABLE-1).




Map showing the states (red) where HEC hotspot mapping were carried out

In order to delineate HEC hotspots, the data were sorted year-wise and joint with the attributes of administrative geospatial layers based on spatial relationship in ArcGIS 10.6.1 software to obtain range-level frequency of HEC that indicates the severity of conflict. The frequency was determined by the number of incidences reported in the range as provided by the states. The general work-flow is as follows (Figure 1):

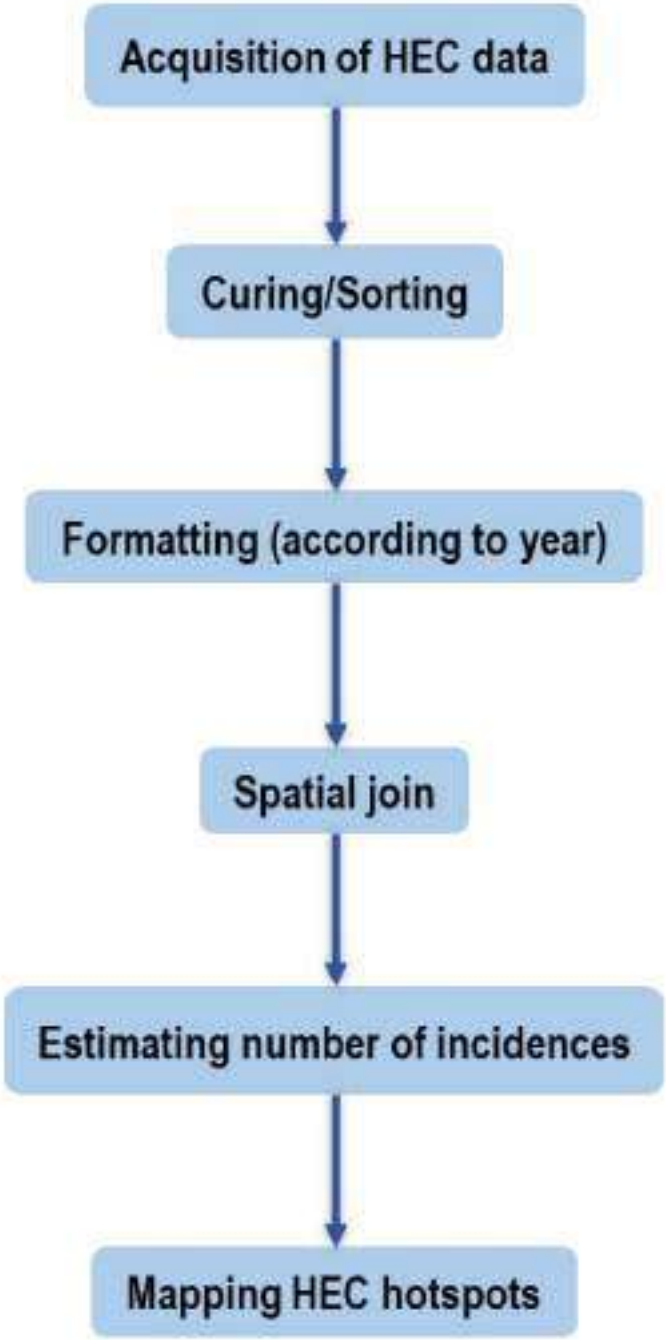



Figure 1 Flow chart of the methodology adapted for mapping HEC hotspots

# Chapter – III
# Andhra Pradesh

## Andhra Pradesh

The state of Andhra Pradesh (AP) has elephants in two distinct regions. Within the state, a small splinter group of elephants operating in northern AP constitutes the East-Central regional population whereas elephants occurring in southern AP constitutes the Southern regional population. The elephant populations occurring in both the northern AP and southern AP are discrete. Elephant occurrence in AP (both north and south) is a relatively recent phenomenon (since 1980s). As per the synchronized elephant census of 2017, the elephant population in the state was estimated to be around 65, with most of the elephants occurring in southern region.

The HEC data obtained from AP forest department pertains to the period 2017 – 2020 (January). The data comprises of information only on human and elephant deaths and did not include crop and property damage. During the period 2017-2020, HEC in the form of human and elephant mortalities was reported 4 districts encompassing 7 forest divisions (Table-2).

**Table-2 HEC reported for Andhra Pradesh for the period 2017-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2017 – 2020 (January) |
| Districts affected | 4 |
| Divisions affected | 6 |
| Reported elephant death | 12 |
| Reported human death | 13 |
| Elephant Population (as per 2017 census) | 65 |

### Human deaths

A total of 13 human deaths were reported from both north and south AP from 6 forest ranges (Fig-3). The inter-annual trend in the human deaths due to elephants is depicted (Fig-2)

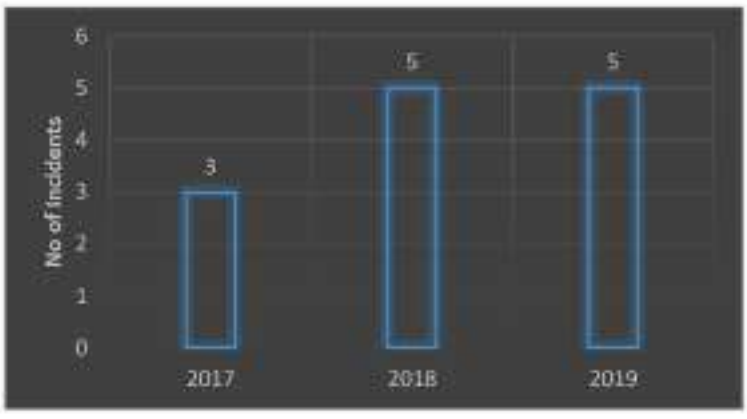



Figure 2 Inter-annual trend of Human deaths

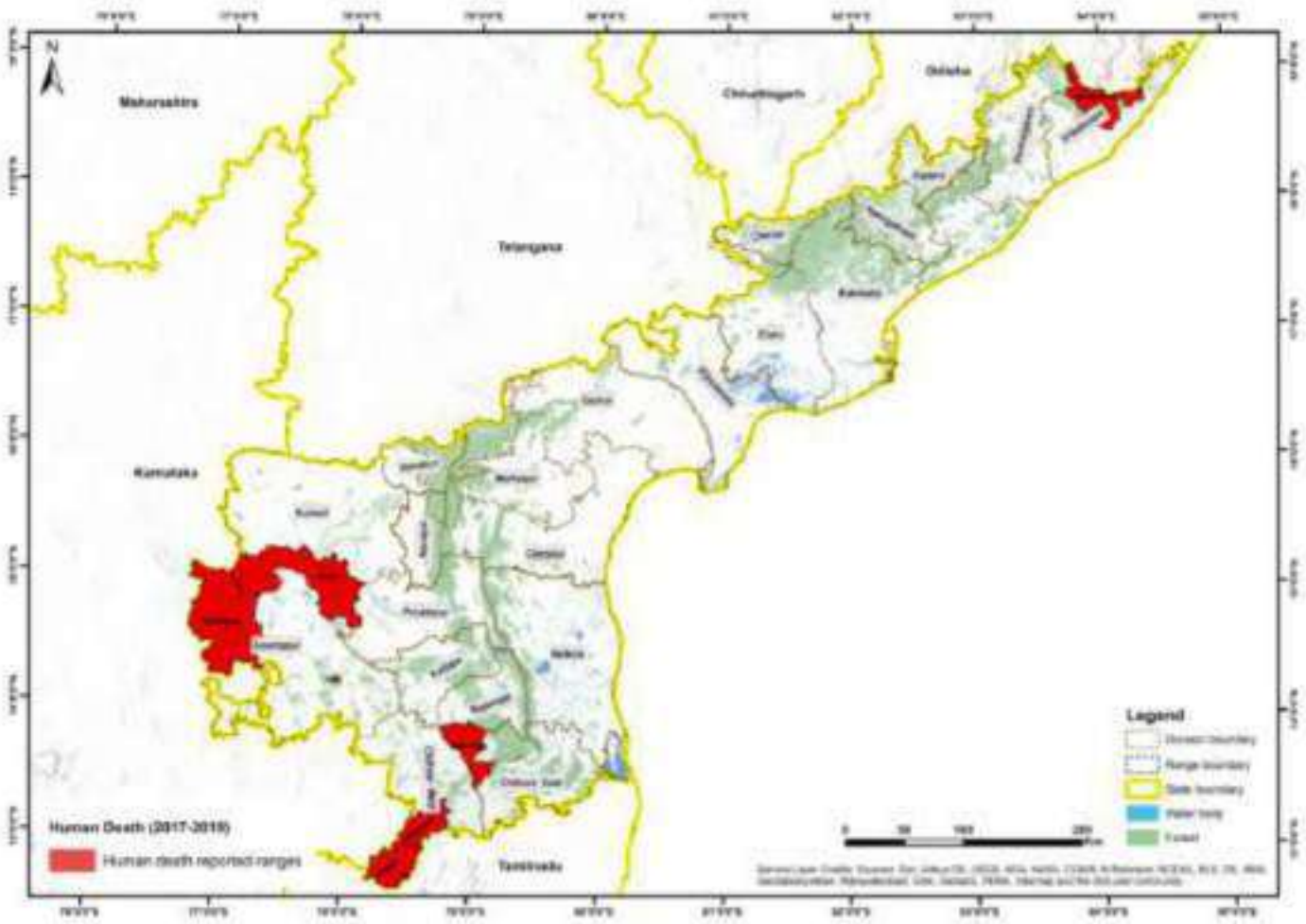



Figure 3 Ranges reporting Human deaths during the period 2017-2019 in Andhra Pradesh

## Elephant deaths

A total of 12 elephant deaths were reported from both north and south AP from 6 forest ranges (Fig-5). The causes of elephant deaths are provided in Fig-6. The inter-annual trend in the elephant deaths is depicted in Fig-4.

Figure 4 Inter-annual trend of elephant deaths

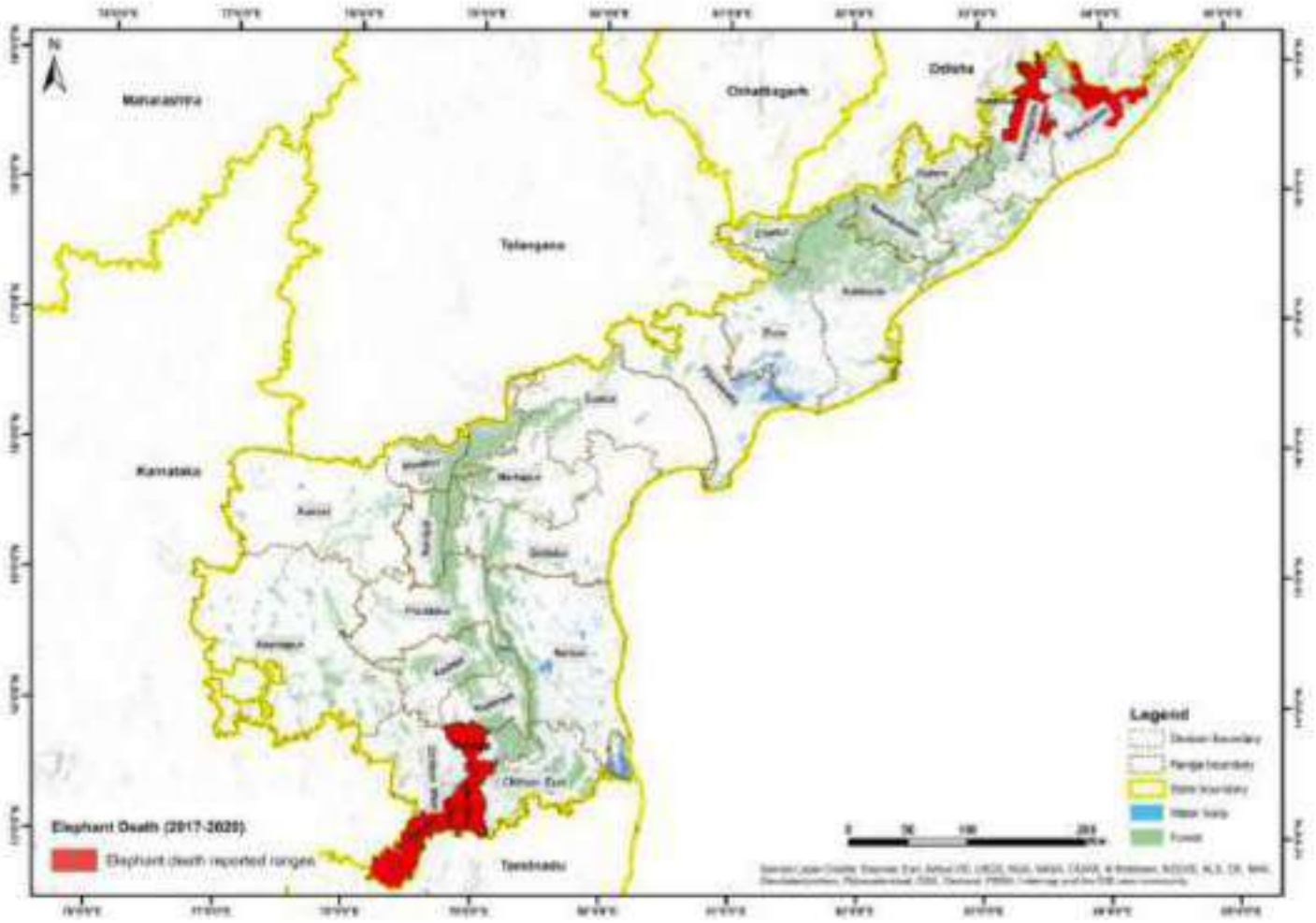



Figure 5 Ranges reporting elephant deaths during the period 2017-2020 in Andhra Pradesh

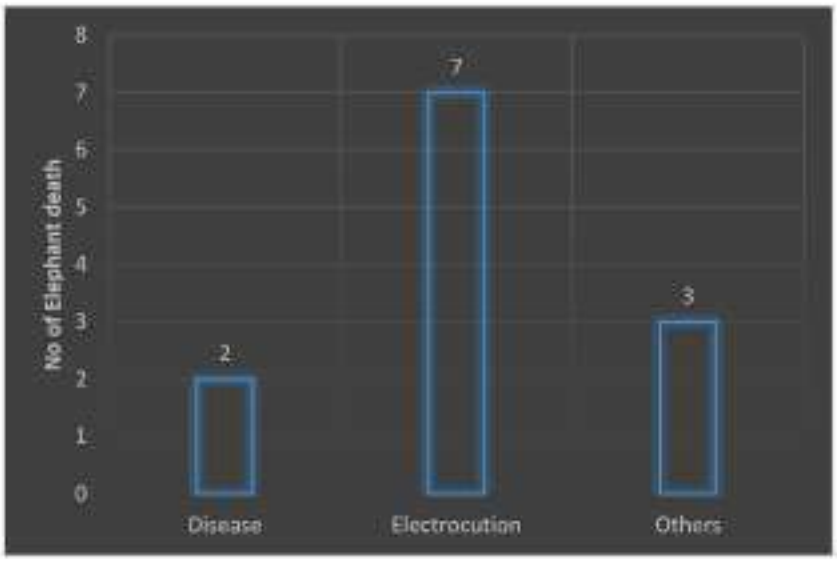



Figure 6 Cause of elephant deaths

# Chapter – IV
# Arunachal Pradesh

## Arunachal Pradesh

In the state of Arunachal Pradesh much of the wild lands occupied by elephants had always been both physically and politically inaccessible. Elephants habitat in the state cover a total area of over 7000 km$^2$ comprising of 25 forest divisions. A total of 1614 elephants were estimated in the 2017 synchronized elephant population.

The HEC data obtained from Arunachal Pradesh Forest Department pertains to the period 2015 – 2020. The data constitutes human deaths, crop and property damage due to elephants. Elephant mortality details were not available.

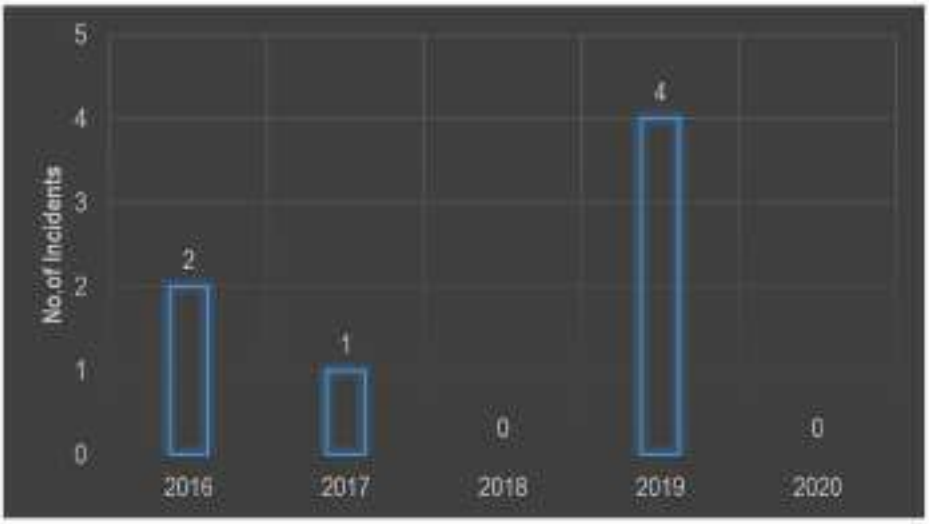
During the period 2015-2020, HEC in the form of human death, crop and property damage was reported from 8 districts encompassing 13 forest divisions (Table-3).

| Particulars | Details |
|---|---|
| Period of reported HEC | 2015-2020 |
| Districts affected | 8 |
| Division affected | 13 |
| Reported elephant death | N/A |
| Reported human death | 7 (2016-2020) |
| Reported crop damage | 614 (2015-2019) |
| Reported property damage | 34 (2015-2020) |
| Elephant Population | 1614 |

**Table-3 HEC reported for Arunachal Pradesh for the period 2016-2020**

### Human deaths

A total of 7 human deaths were reported from 4 forest divisions in the state namely Banderdewa FD, Kanubari FD, Namsai FD and Pakke WLS (Fig-8). The inter-annual trend in the human deaths due to elephants is depicted (Fig-7)



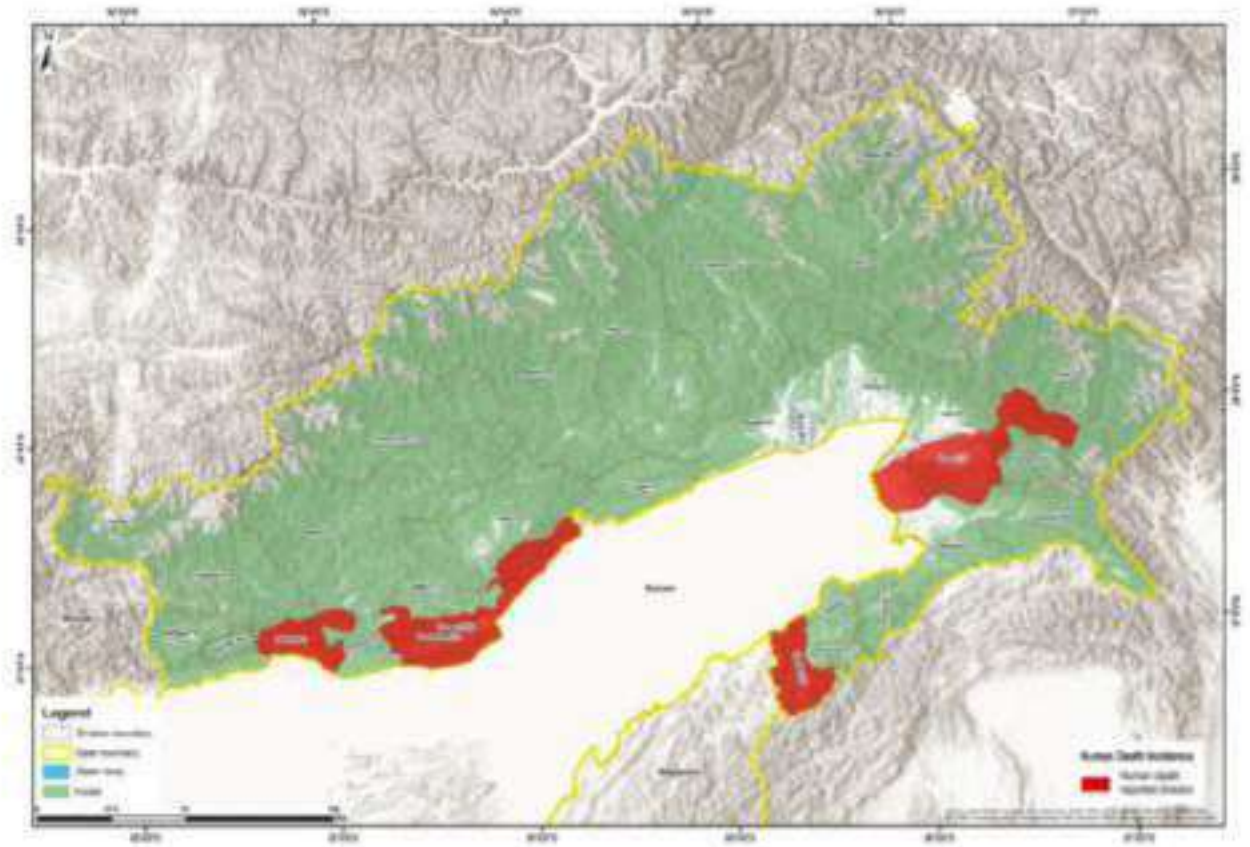


Figure 8 Divisions reporting Human deaths during the period 2016-2020 in Arunachal Pradesh

## Crop losses

A total of 13 forest divisions from the state have reported crop losses due to elephants during the period 2015-2019. A total of 722 acres of crop losses were reported from Along FD, Banderdewa FD, Daporijo FD, Deomali FD, Dibang FD, Hapoli FD, Itanagar WLS, Likabali FD, Lohit FD, Namsai FD, Pakke WLS, Pasighat FD and Sagale FD across the foothills of the lesser Himalayan region in the state

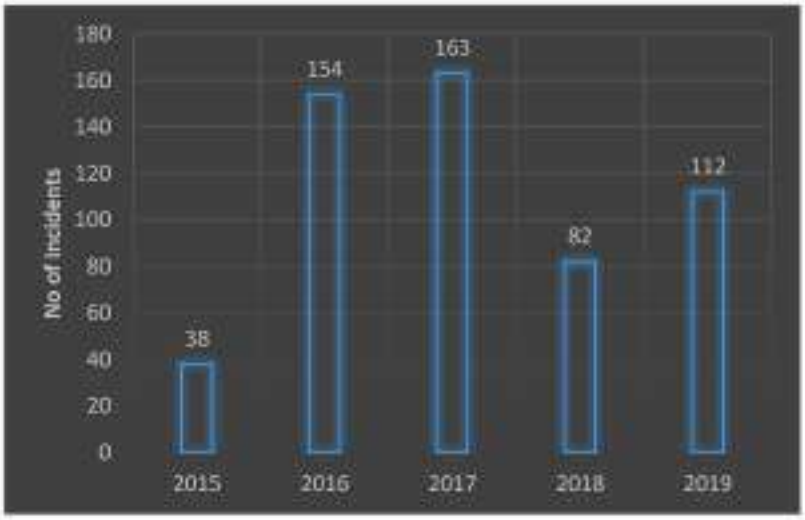



Figure 9 Inter-annual trend of Crop losses

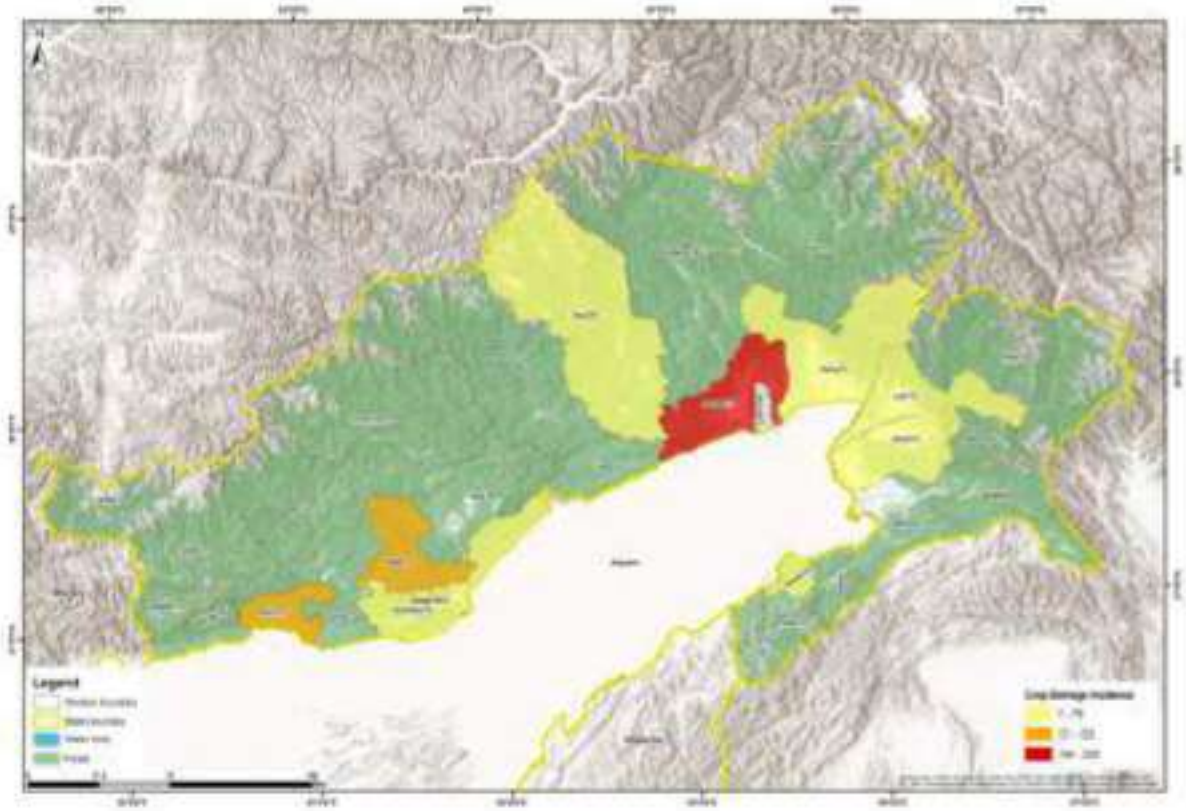


Figure 10 Divisions reporting Crop loss during the period 2015-2019 in Arunachal Pradesh

## Loss of property

Property losses were reported from 5 forest divisions namely during the period 2015-2020 Banderdewa FD, Deomali FD, Lohit FD, Pakke WLS and Pasighat FD from the state. The property loss due to elephants in the state is depicted in (Fig-12).

Figure 11 Inter-annual trend of property loss

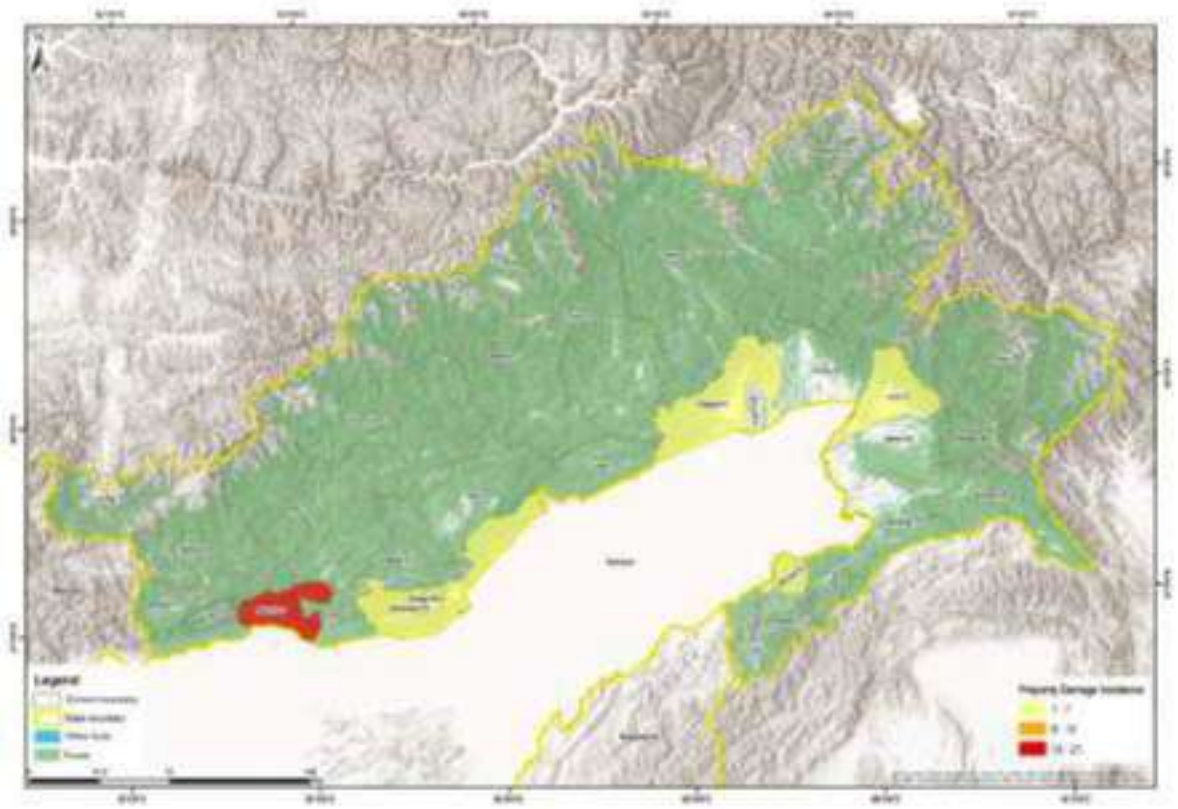


Figure 12 Divisions reporting loss of property during the period 2015-2020 in Arunachal Pradesh

# Chapter – IV
# Assam

## Assam

As per the 2017 synchronized elephant census conducted by Project Elephant in collaboration with Assam Forest Department, the state has the second largest population of elephants (5719 elephants) in the country next to Karnataka, representing around 20% of India's wild elephant population and almost 10-15% of the global Asian elephant population. In Assam, the forests in Himalayan foothills contain one of the last remaining viable elephant populations and also one of the most acutely threatened.

Human-elephant conflict in the form of crop losses, loss of property, human and elephant deaths is widespread in Assam. HEC is reported from 21 districts affecting 38 forest divisions for the period 2016 to 2020.

**Table-4 HEC reported for Assam for the period 2017-2021**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2016-2020 |
| Districts affected | 21 |
| Division affected | 38 |
| Reported elephant death | 148 (2019-2020) |
| Reported human death | 409 (2016-2020) |
| Reported Crop damage (in Bigha) | 16190 (2017-2021) |
| Reported Property damage | 5076 (2017-2021) |
| Elephant Population | 5716 |

### Human deaths

Human deaths due to elephants were widespread in Assam. A total of 409 human deaths from 37 forest divisions were reported for the period 2016-2020. The number of human deaths were relatively higher in Dhansiri and Goalpara forest divisions (Fig-14).

Figure 13 Inter-annual trend of Human deaths

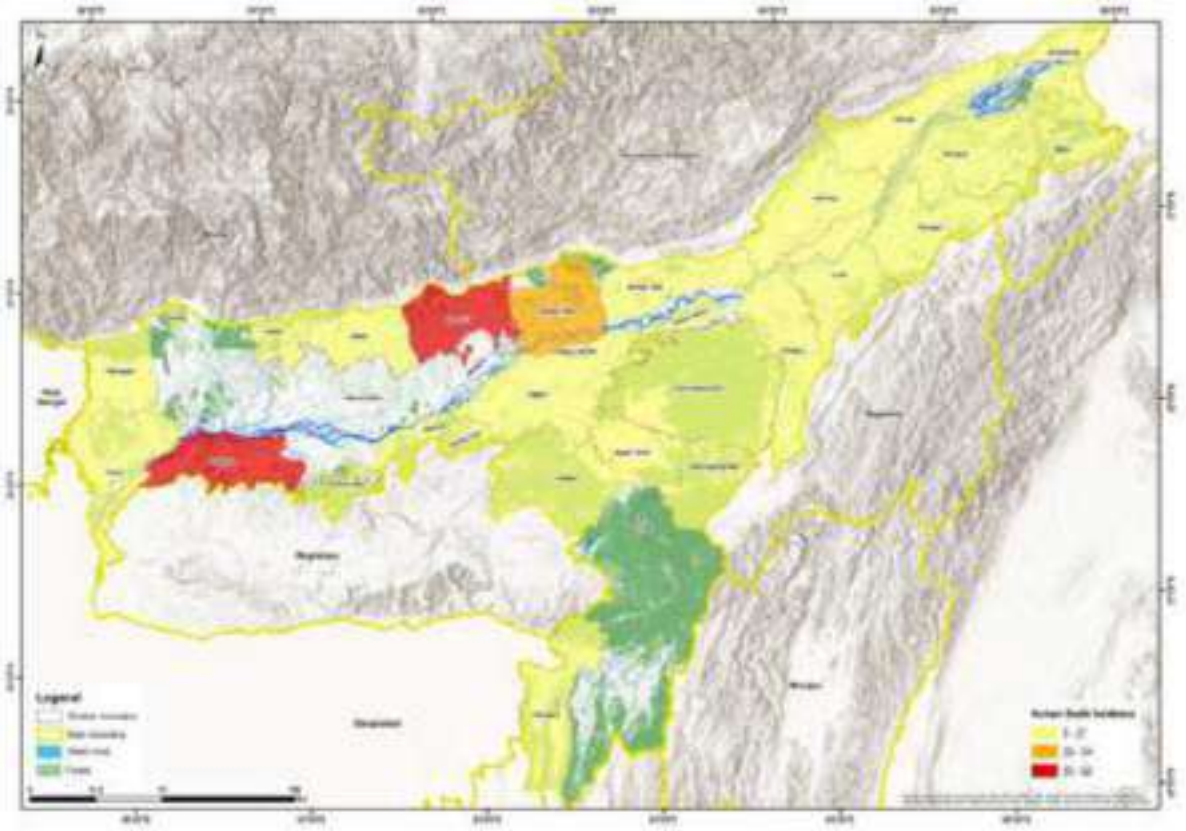


Figure 14 Divisions reporting Human death during the period 2016-2020 in Assam

## Crop losses

A total of 16190 incidences of crop losses due to elephants were reported from 33 divisions across Assam for the period 2017-2021. Of the 33 divisions that reported crop losses due to elephants, the number of incidences were relatively higher in Sonitpur West, Jorhat, Eastern Assam, Nagaon South and Sibasagar forest divisions (Fig-16). The intensity of crop losses seems to be increasing during the period 2017-2021 (Fig-15)

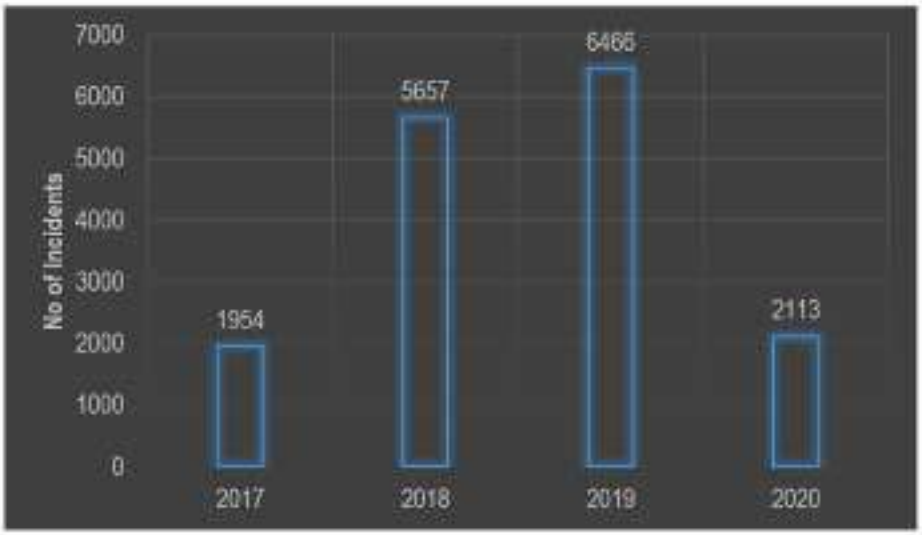



Figure 15 Inter-annual trend of Crop losses

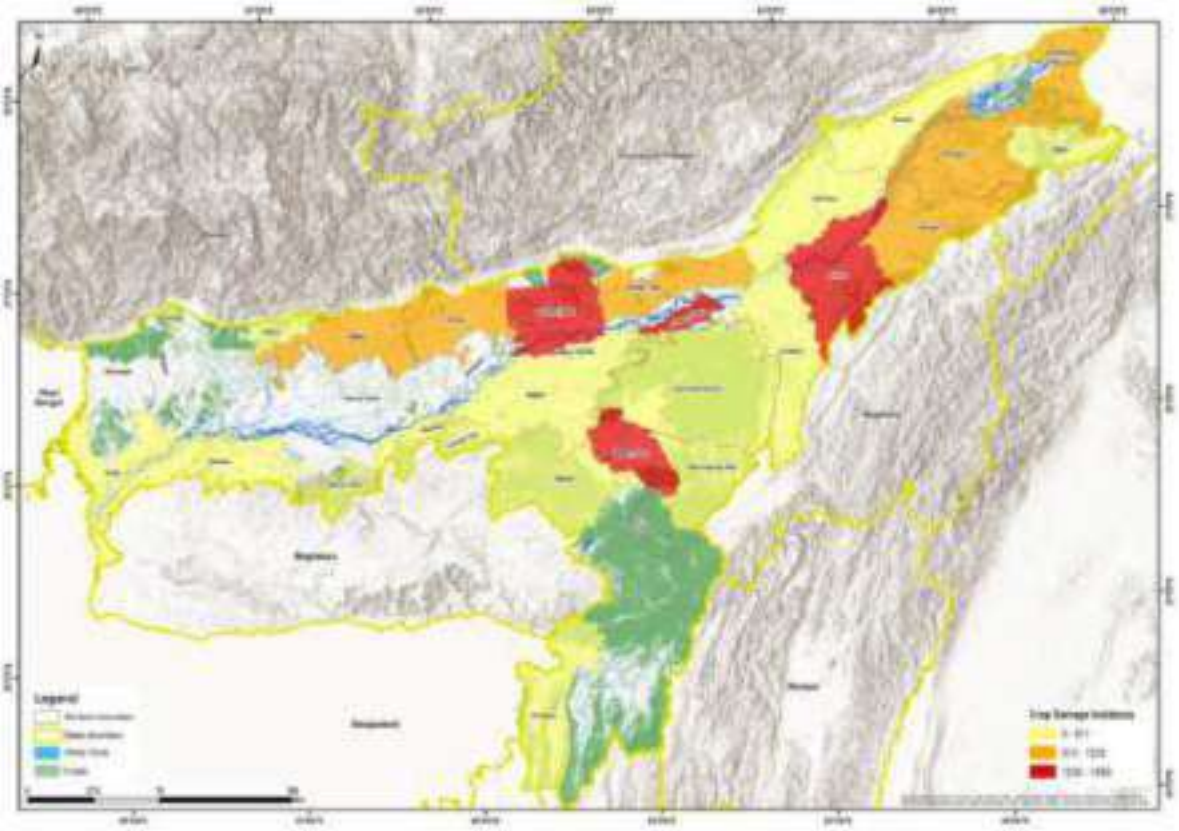


Figure 16 Divisions reporting Crop loss during the period 2017-2021 in Assam

## Property loss

Loss of houses damaged by elephants were reported from 33 forest division across the state during the period 2017 to 2021. Of the ranges reporting house damage by elephants, the intensity was relatively high in Sonitpur West, Baksa, Nagaon Dhansiri and Goalpara Forest Divisions (Fig-18).

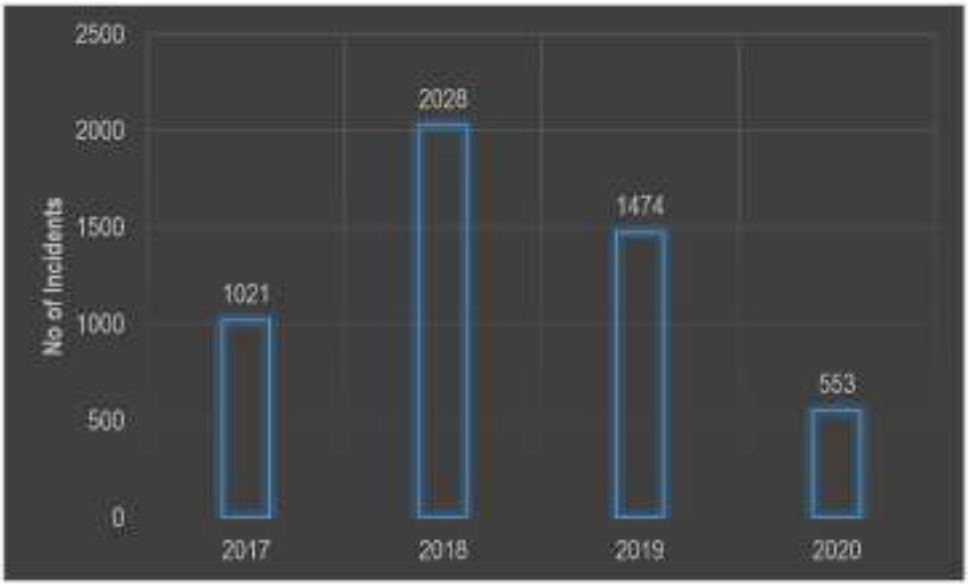



Figure 17 Inter-annual trend of Property losses

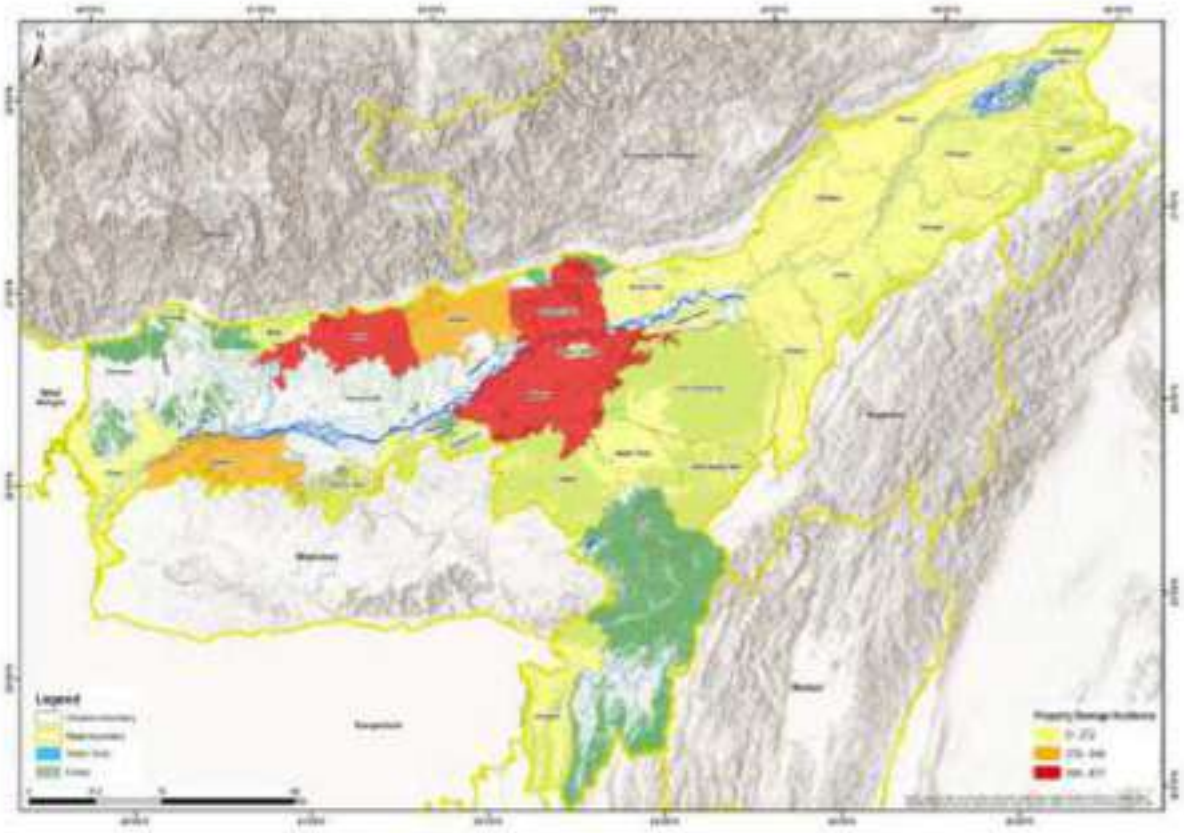


Figure 18 Divisions reporting loss of property during the period 2017-2021 in Assam

## Elephant deaths

A total of 148 elephant deaths were reported across the state during the period 2019-2020 (Fig-19).

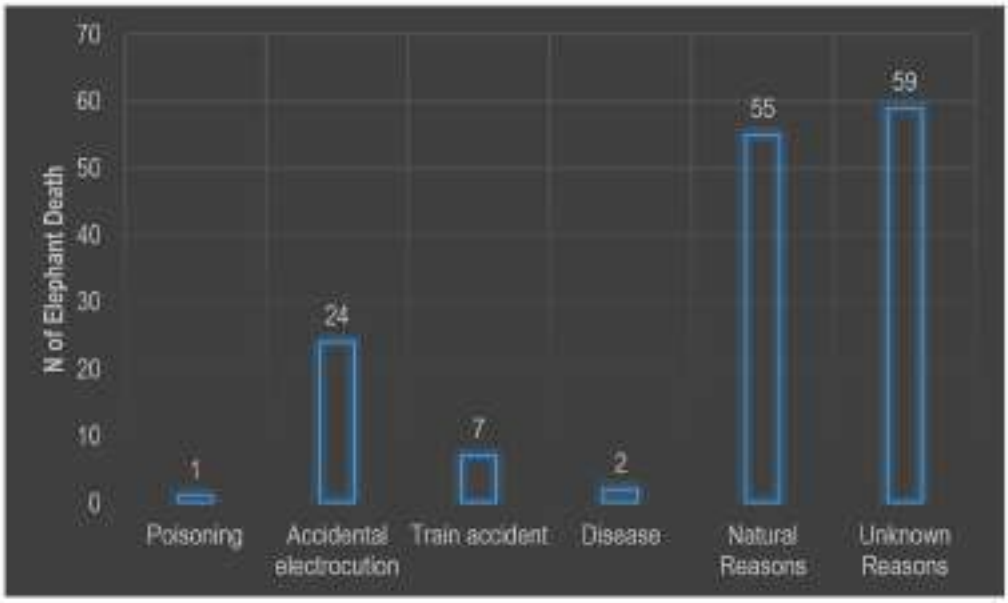



Figure 19 Cause of elephant death

# Chapter – IV
# Chhattisgarh

## Chhattisgarh

Chhattisgarh is one of the five states in the east-central region that harbours wild elephant populations. Although elephant recolonization in Chhattisgarh is a relatively recent phenomenon (after the year 2000), the state reports high intensity of human-elephant conflict in the form of crop losses, damage to property, loss of human lives and loss of elephants as well. As per the synchronized elephant census of the Project Elephant conducted during the year 2017, the elephant population was estimated be around 250 (247 as per the total count approach). The HEC for the period 2015-2020 had been mapped (Fig-21 for crop losses, Fig-22 for property losses and Fig-25 for human deaths). The inter-annual trends of HEC have also been provided (Fig-20, Fig-23 and Fig-25).

**Table-5 HEC reported for Chhattisgarh for the period 2015-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2015 - 2020 |
| Districts affected | 7 |
| Divisions affected | 14 |
| Reported elephant death | 25 |
| Reported human death | 115 |
| Reported crop damage incidents | 50856 |
| Reported property damage incidents | 3302 |
| Elephant Population (as per 2017 census) | 247 |

### Crop losses

Crop losses for the period 2015-2018 were reported from 60 ranges from 14 forest divisions pertaining to 7 districts. Relatively high incidences of crop losses due to elephants were reported from Pratappur range of Surajpur Forest Division, Wadrafnagar range of Balrampur Forest Division and Udaipur range of Surguja Forest Division.

Figure 20 Inter-annual trend of crop damage in Chhattisgarh

The crop losses due to elephants have numerically increased in Chhattisgarh during the period 2015 to 2018 (Fig-21).

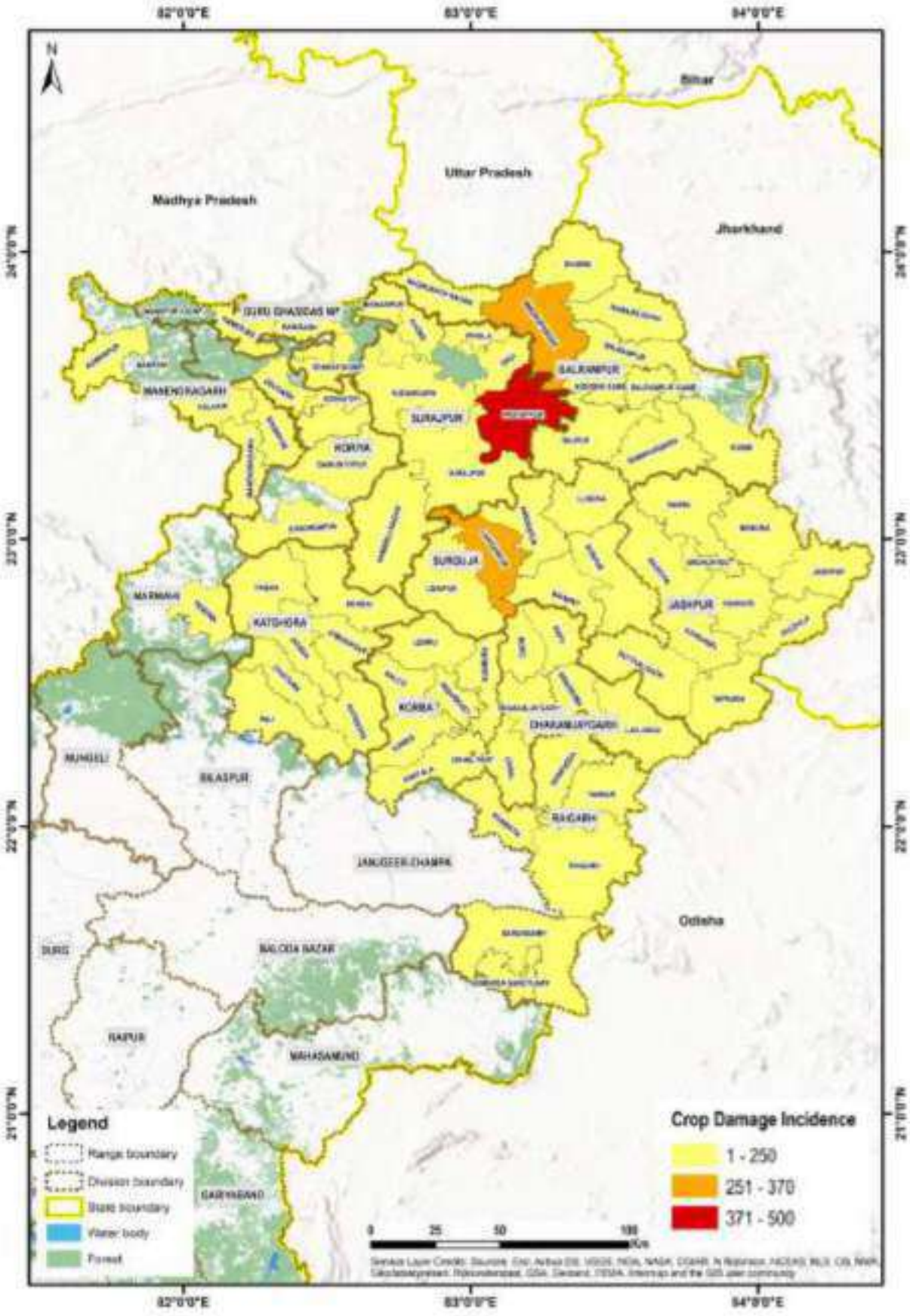



Figure 21 Ranges reporting crop damage incidence during the period 2015-2018 in Chhattisgarh

## Loss of houses/ other property

Loss of houses by elephants were reported from 48 forest ranges from across 14 forest divisions during the period 2015 to 2018. Of the ranges reporting house damage by elephants, the intensity was relatively high in Raghunathnagar and Rihand ranges of Surajpur; Wadrafnagar, Balrampur, Sankargarh and Dhamni ranges of Balrampur Forest Division; Bhadalkhol Wildlife Sanctuary; Mainpat range of Surguja Forest Division and Chaitama range of Katghora Forest Division (Fig-22).

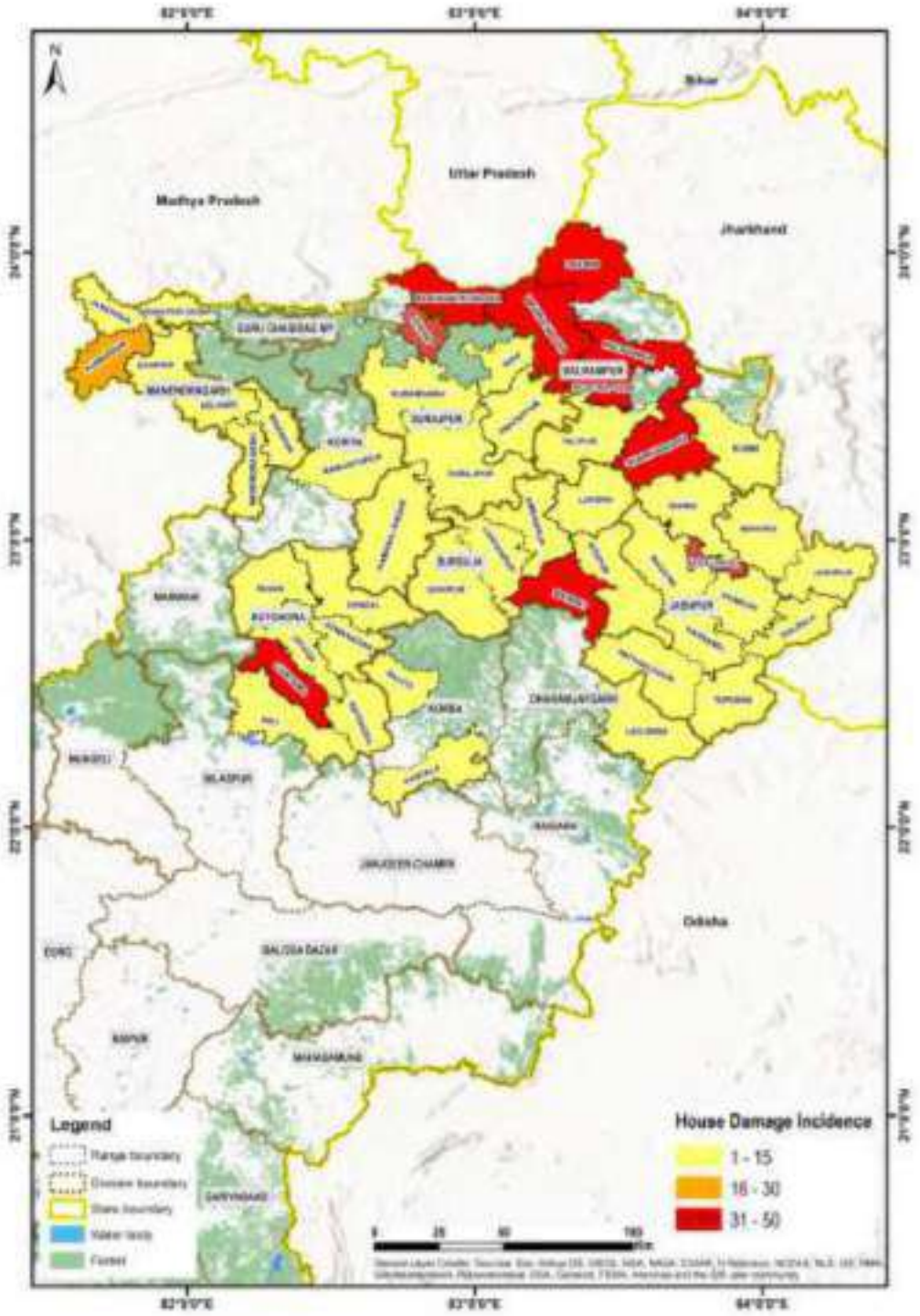



Figure 22 Ranges reporting property damage incidence during the period 2015-2018 in Chhattisgarh

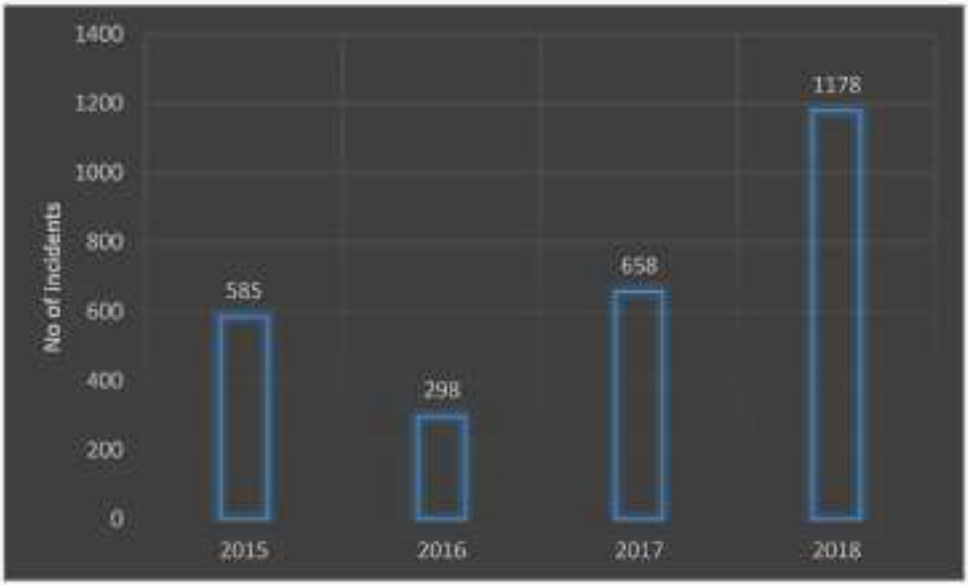



Figure 23 Inter-annual trend of house damage in Chhattisgarh

The incidences of house losses due to elephants across the years have numerically increased in Chhattisgarh during the period 2015 to 2018 (Fig-23).

## Human deaths due to elephants

A total of 115 human fatalities due to elephants have been reported for the period 2017 – 2020. While human fatalities were reported from 35 forest ranges across 9 forest divisions, the number of incidences were particularly high in Rajpur range of Balrampur FD, Surajpur range of Surajpur FD; Udaipur range of Surguja FD; Chaal range of Dharamjaigarh FD; Pathalgaon range of Jashpur FD and Kartala, Kudumara and Balco ranges of Korba FD.

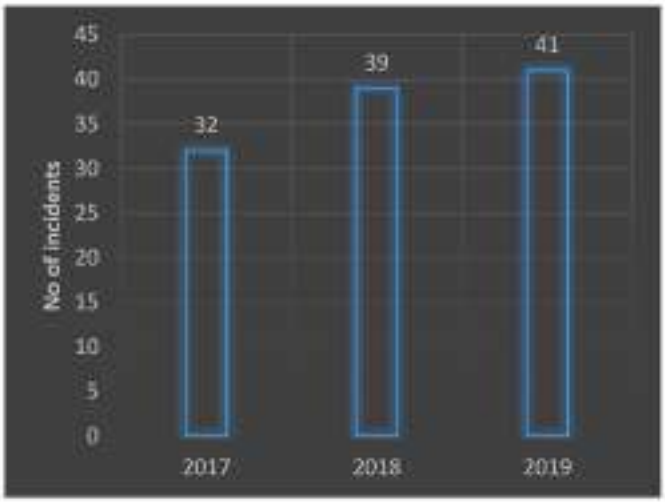



Figure 24 Inter-annual trend of Human death

The temporal trend of human mortality due to elephants for the period 2017 – 2019 is provided (Fig-24). Over, the patterns show an increasing trend of human deaths due to elephants.

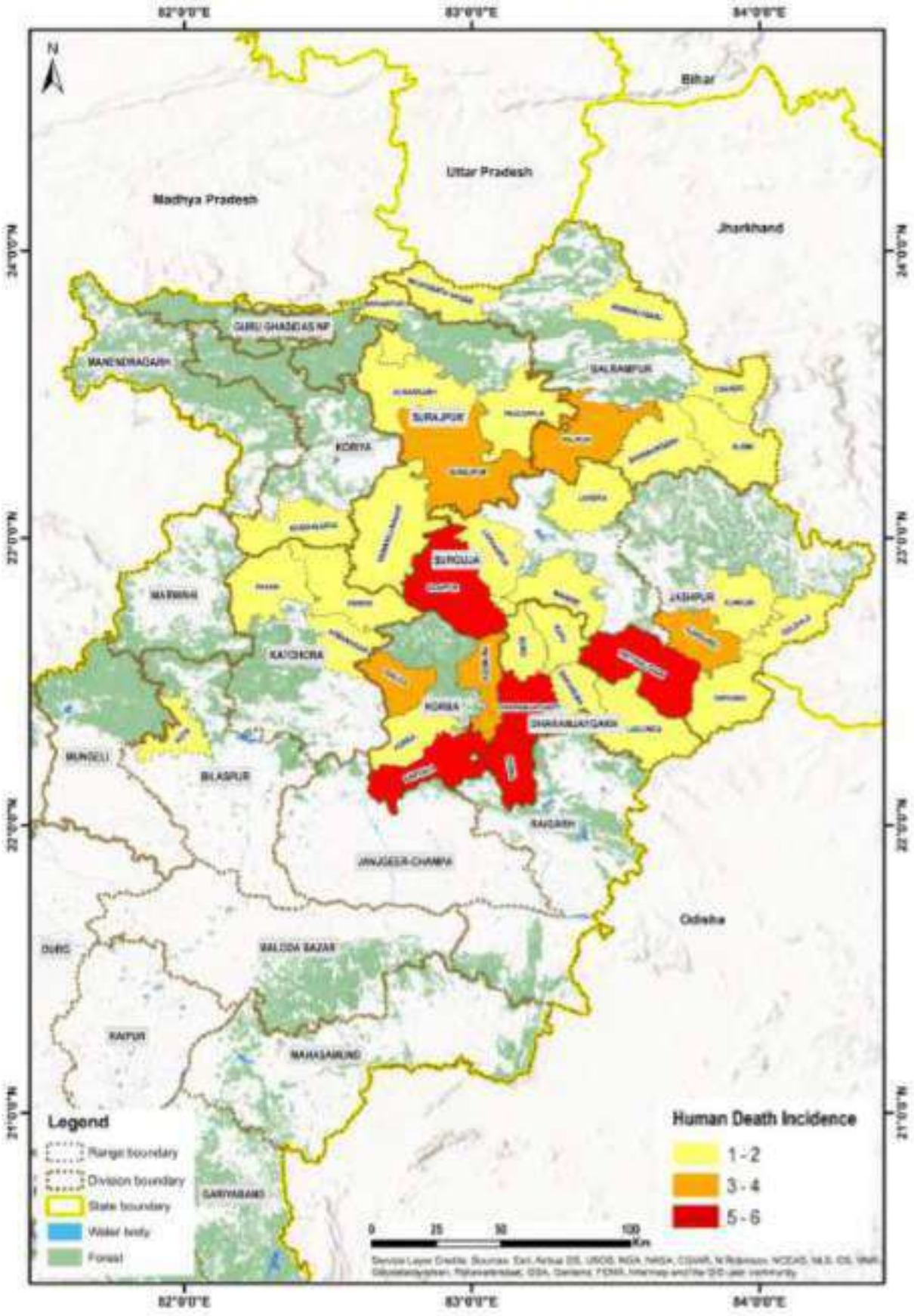



Figure 25 Ranges reporting human death incidence during the period 2017-2019 in Chhattisgarh

## Elephant deaths

A total of 25 elephant deaths were reported from 10 forest ranges during the period 2015-2019 (Fig-26). Of the total deaths reported, the numbers were relatively high in Pingla range of Tamor Pingla WS and Kunkuri range of Jashpur Forest Division

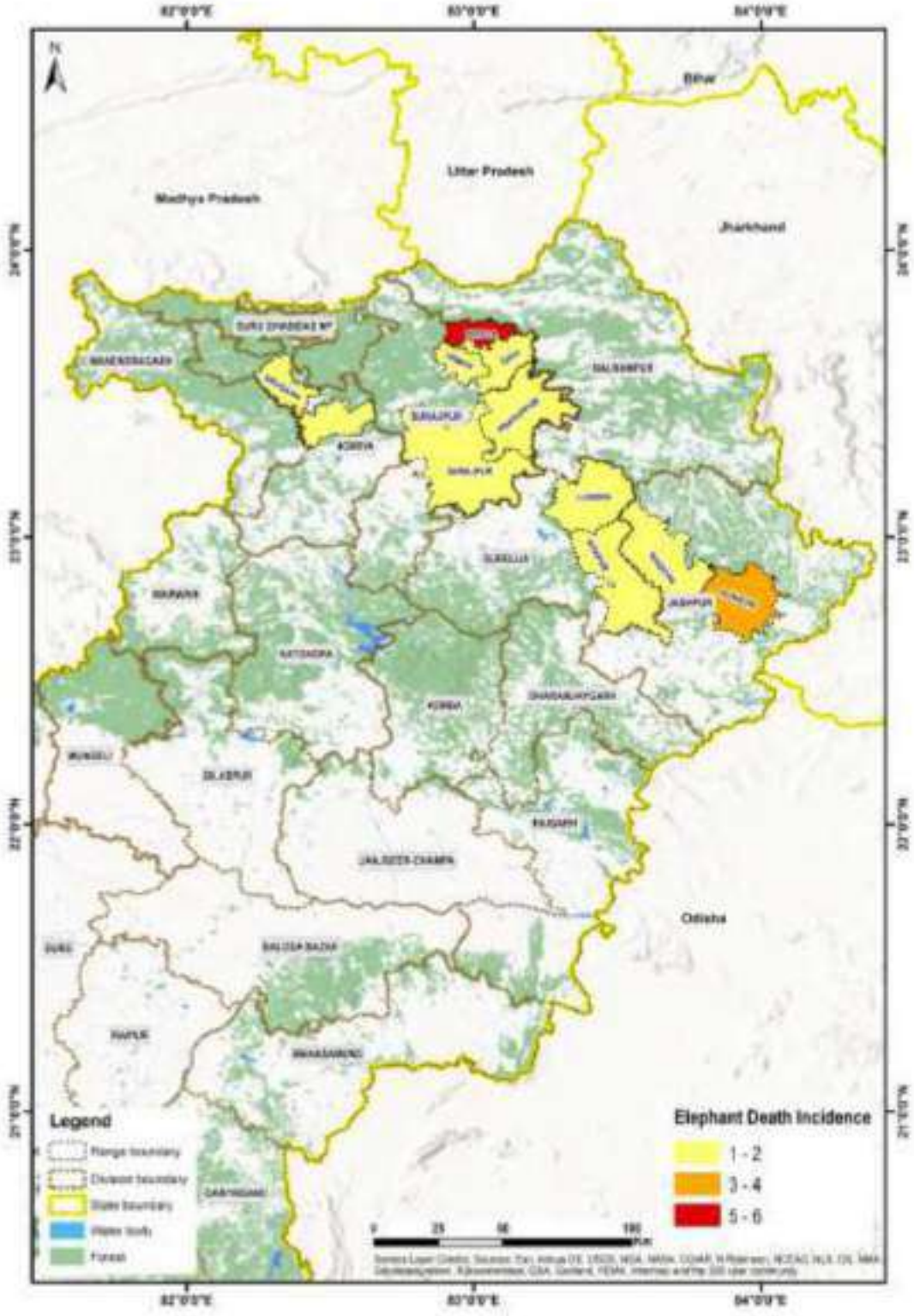



Figure 26 Ranges reporting Elephant deaths incidence during the period 2015-2019 in Chhattisgarh

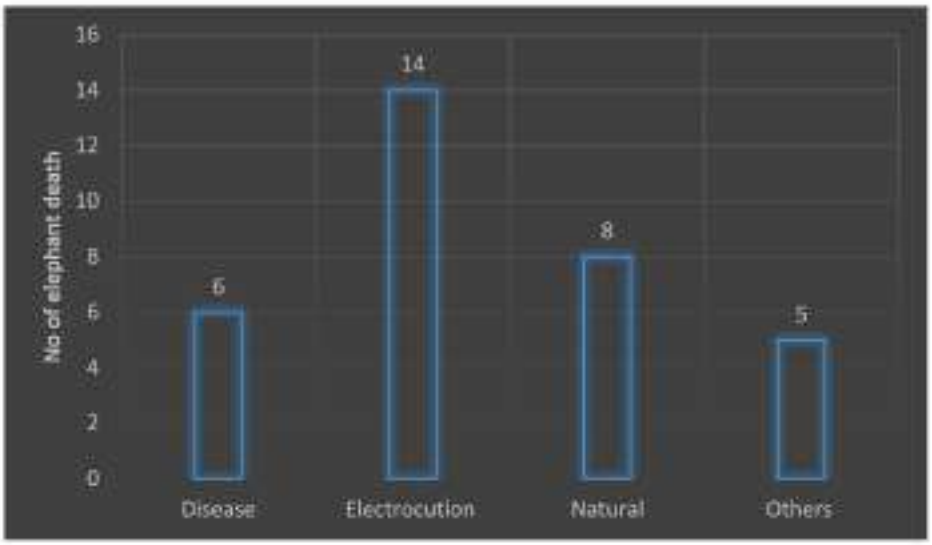



Figure 27 Cause of elephant death

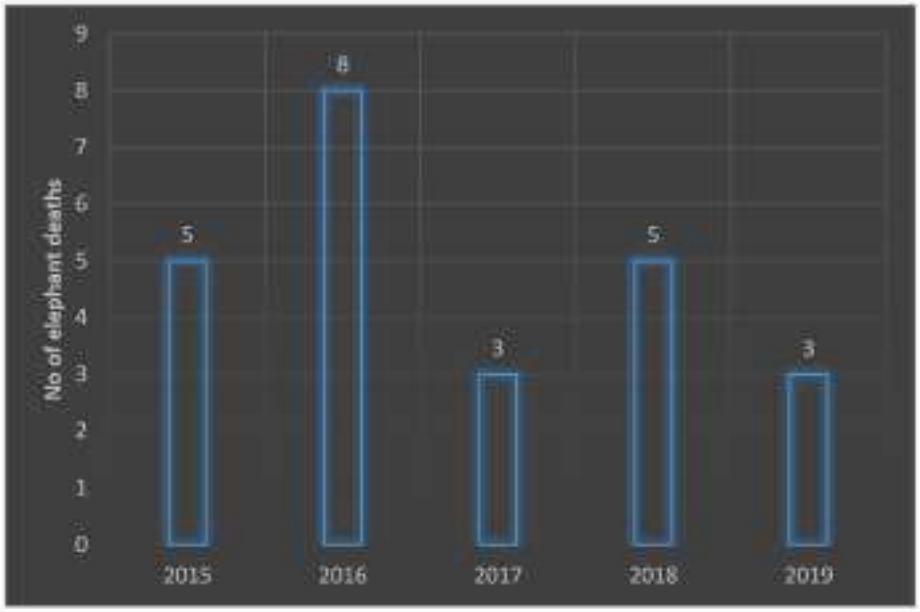



Figure 28 Inter-annual trend of Elephant death

The temporal trend of elephant mortality for the period 2015 – 2019 is provided (Fig-27). The reported reasons for elephant deaths have been provided (Fig-28).

# Chapter – V
# Karnataka

## Karnataka

The state of Karnataka state has the largest population of elephants in India harboring about 6000 elephants, which is more than 20% of the estimated elephant population in the entire country. Elephants occur in 33 forest divisions in Karnataka. In Karnataka, the elephants are primarily distributed along the Western Ghats mountain ranges encompassing many districts and also in the Eastern Ghats along the southern part of the state neighboring Tamil Nadu. The state also reports widespread HEC, which is locally acute in certain "hotspots". The HEC in the form of crop losses, property damage (damage to tube-wells, storage godowns etc), human and elephant deaths pertaining to the period 2018-2021 have been described.

**Table-6 HEC reported for Karnataka for the period 2018-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2018 - 2021 |
| Districts affected | 19 |
| Ranges affected | 120 |
| Reported elephant death | 107 |
| Reported human death | 56 |
| Reported crop damage incidents | 3270 |
| Reported property damage incidents | 8041 |
| Elephant Population (as per 2017 census) | 6000 |

### Crop losses

A total of 132 forest ranges from across in the state have reported crop losses due to elephants during the period 2018-2021. While crop losses were widespread, relatively high levels of crop losses were reported from Arsikere and Sakleshpur ranges in Hassan FD, Mudigere range in Chikmagalur Forest Division; Ponnampet, Virajpete, Kushalnagar and Somvarpet ranges in Kodagu FD; Sargur and HD Kote ranges in Mysore FD; Gundlupete in Chamrajnagar FD; Channapatna range in Ramnagara FD and Kanakpura range in Bannerghatta NP.

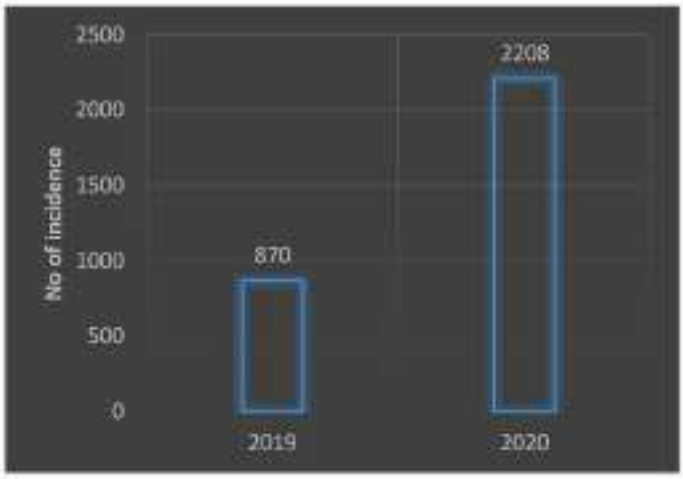



Figure 29 Inter-annual trend of Crop loss

During the period 2019-2020, the number of incidences of crop losses due to elephants have increased substantially (Fig-29).

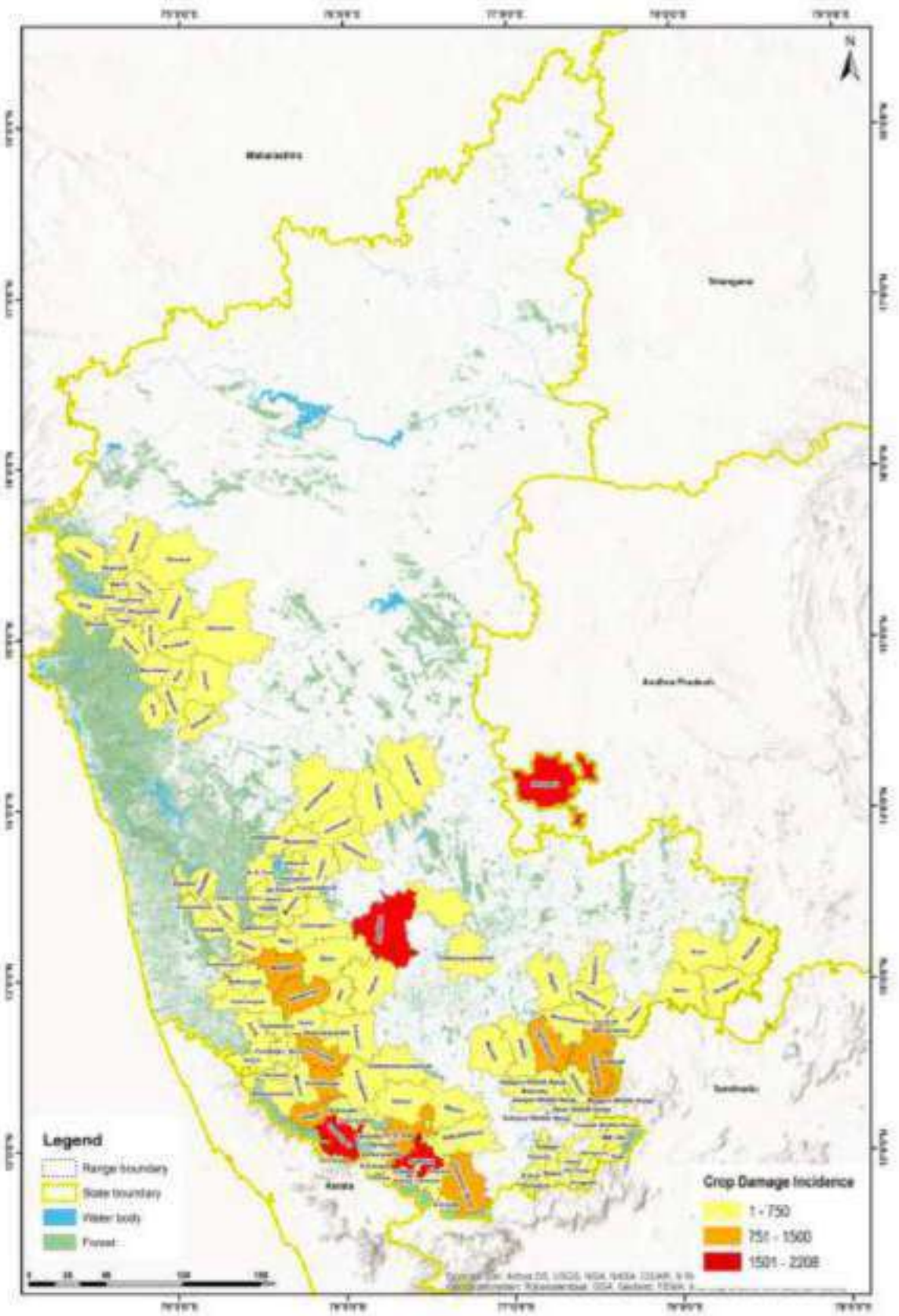



Figure 30 Ranges reporting crop loss incidence during the period 2019-2020 in Karnataka

## Loss of property

Property losses (primarily farm equipment and gadgets) were reported from 64 forest ranges during the period 2019-2021. Relatively high such incidences were reported from Ponnampet range of Kodagu FD; HD Kote and Sargur ranges of Mysore FD; Gundlupete range of Chamrajnagar FD; Malavalli, Sathnur and Channapatna FD of Ramnagara FD and Cauvery WS; Kanakpura range of Bannerghatta NP and Malur range of Bangalore rural FD.

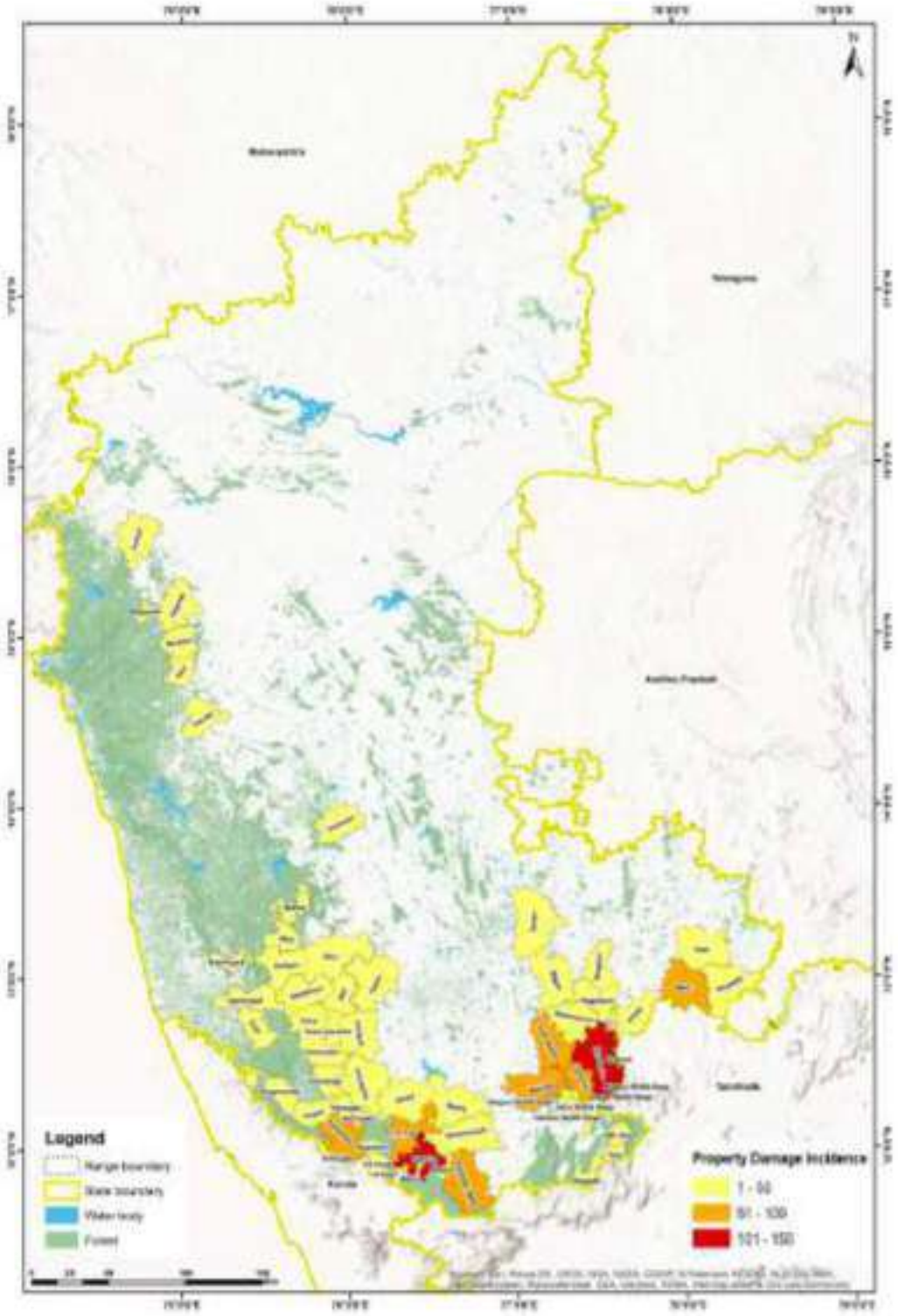



Figure 31 Ranges reporting property loss incidence during the period 2019-2020 in Karnataka

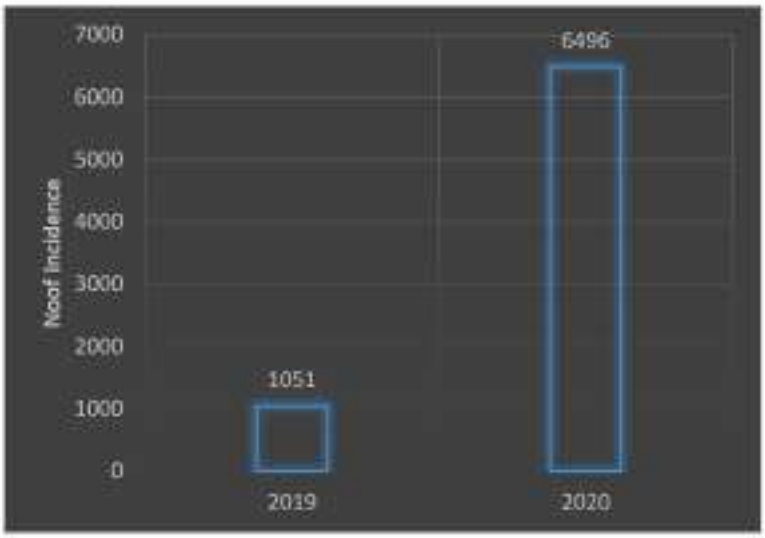



Figure 32 Inter-annual trend of property loss

During the period 2019-2020, the number of incidences of property losses due to elephants have increased substantially (Fig-32).

## Human deaths

A total of 56 human deaths from 26 forest ranges across Karnataka were reported for the period 2019-2021. Kadur range in Chikmagalur FD and Bangarapet range in Kolar FD reported relatively high number of human deaths due to elephants during the period.

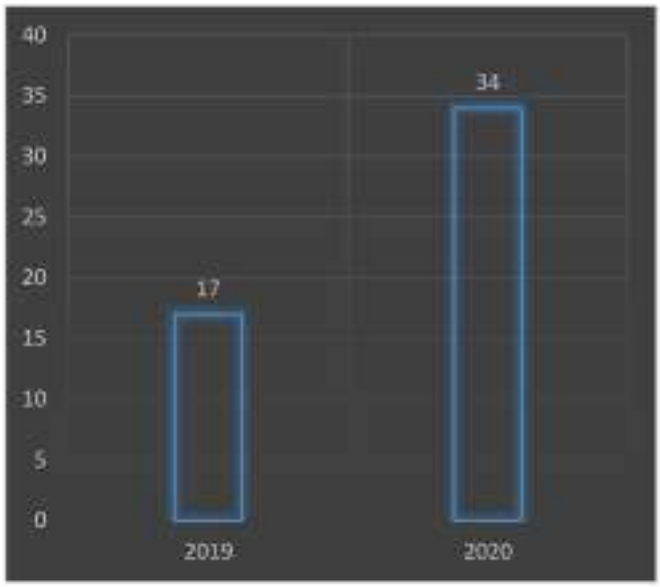



Figure 33 Inter-annual trend of Human death

The human deaths due to elephants in Karnataka reported during 2019 almost doubled during the year 2020 (Fig 33).

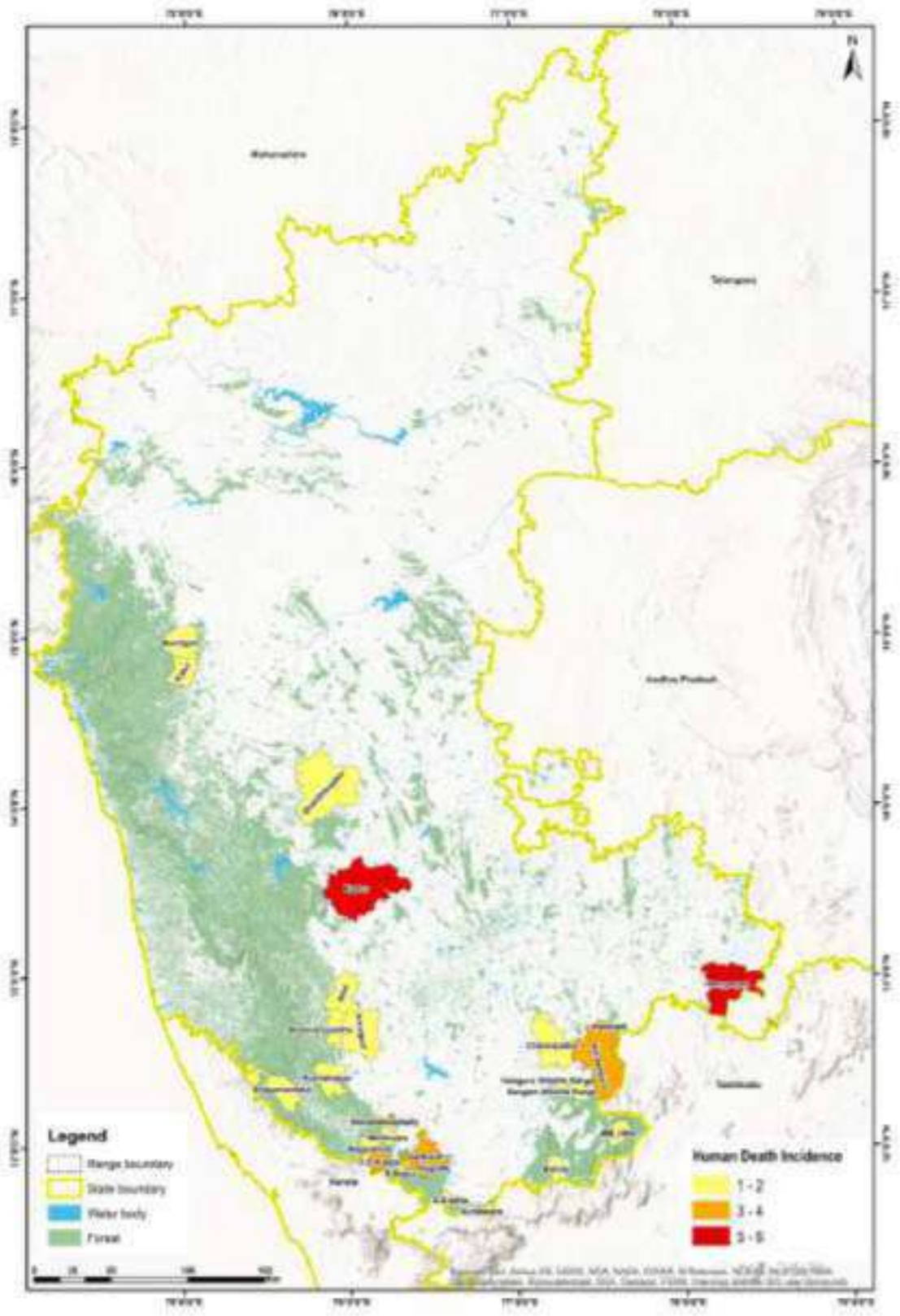



Figure 34 Ranges reporting human death incidence during the period 2019-2020 in Karnataka

## Elephant mortality

During the period 2016-2020, 107 elephant deaths were reported from 31 forest ranges across Karnataka. Relatively high elephant deaths were reported from Hanur and Cowdalli ranges of Cauvery Wildlife Sanctuary and DB Kuppe range of Nagarahole NP.

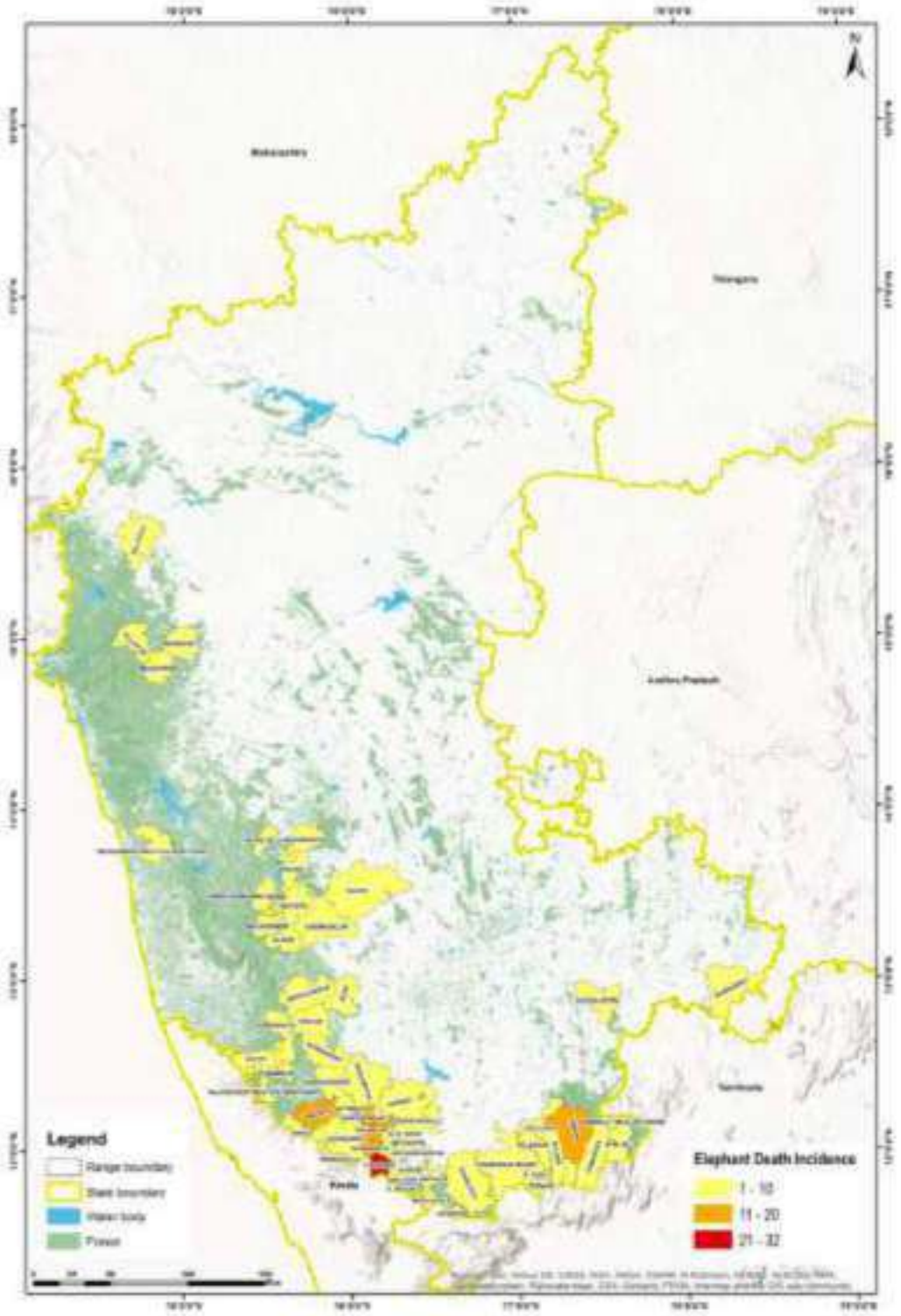



Figure 35 Ranges reporting elephant mortality incidence during the period 2016-2020 in Karnataka

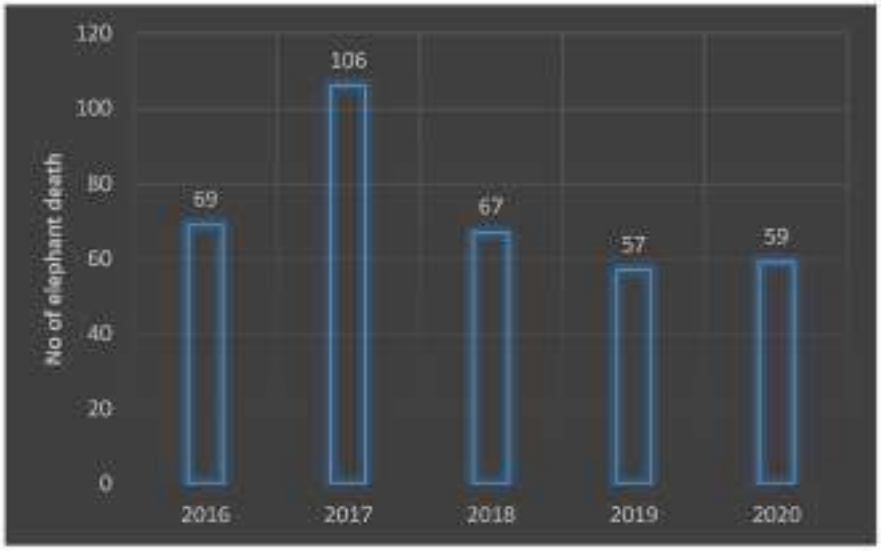



Figure 36 Inter-annual trend of elephant death

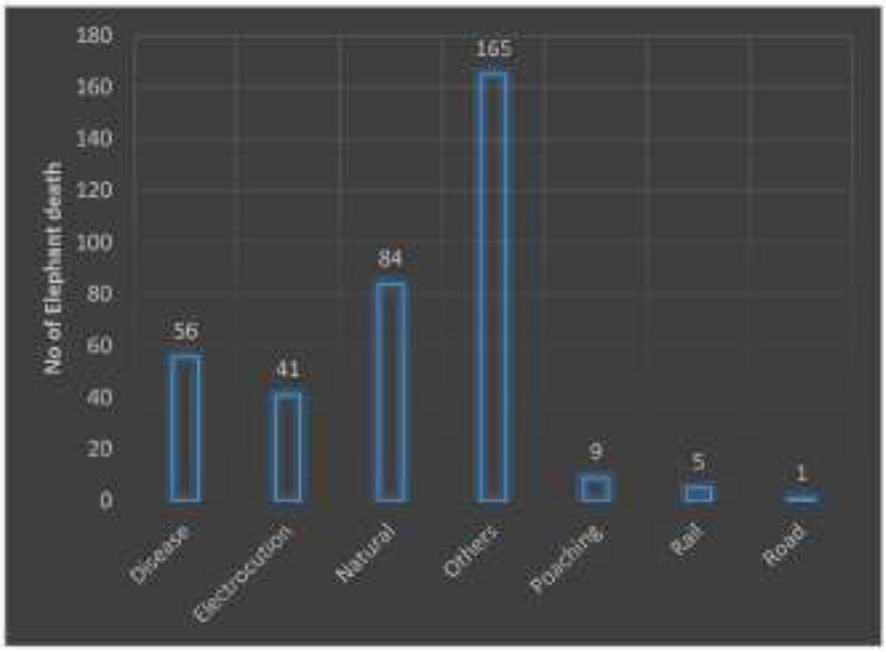



Figure 37 Cause of elephant death

During the period 2019-2020, there was an increase in the total number of reported elephant deaths in the state (Fig-36). The causes of elephant deaths are provided in Fig-37

# Chapter – VI
# Kerala

## Kerala

The state of Kerala ranks third with respect to elephant population size and harbours over 3300 elephants in 37 forest divisions located along the Western Ghats mountain ranges in the state. Human-elephant conflict in the form of crop losses, loss of property, human and elephant deaths is widespread and has been reported from 10 districts affecting 31 forest ranges for the period 2016 to 2020.

**Table-7 HEC reported for Kerala for the period 2016-2021**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2016 - 2020 |
| Districts affected | 10 |
| Ranges affected | 31 |
| Reported elephant death | 385 |
| Reported human death | 55 |
| Reported property damage incidents | 756 |
| Elephant Population (as per 2017 census) | 3322 |

### Property loss

A total of 12 ranges have reported 756 incidences of property damage for the period 2016 – 2020 (Fig-39). For this period, relatively high level of loss of property was reported from Begur, Periya and Mananthavadi forest ranges of Wayanad north Forest Division.

Figure 38 Inter-annual trend of Property damage

During the period 2016 to 2020, the incidences of loss of property due to elephants increased during 2017 and 2018 and then again leveled off during 2019 and 2020 (Fig-38).

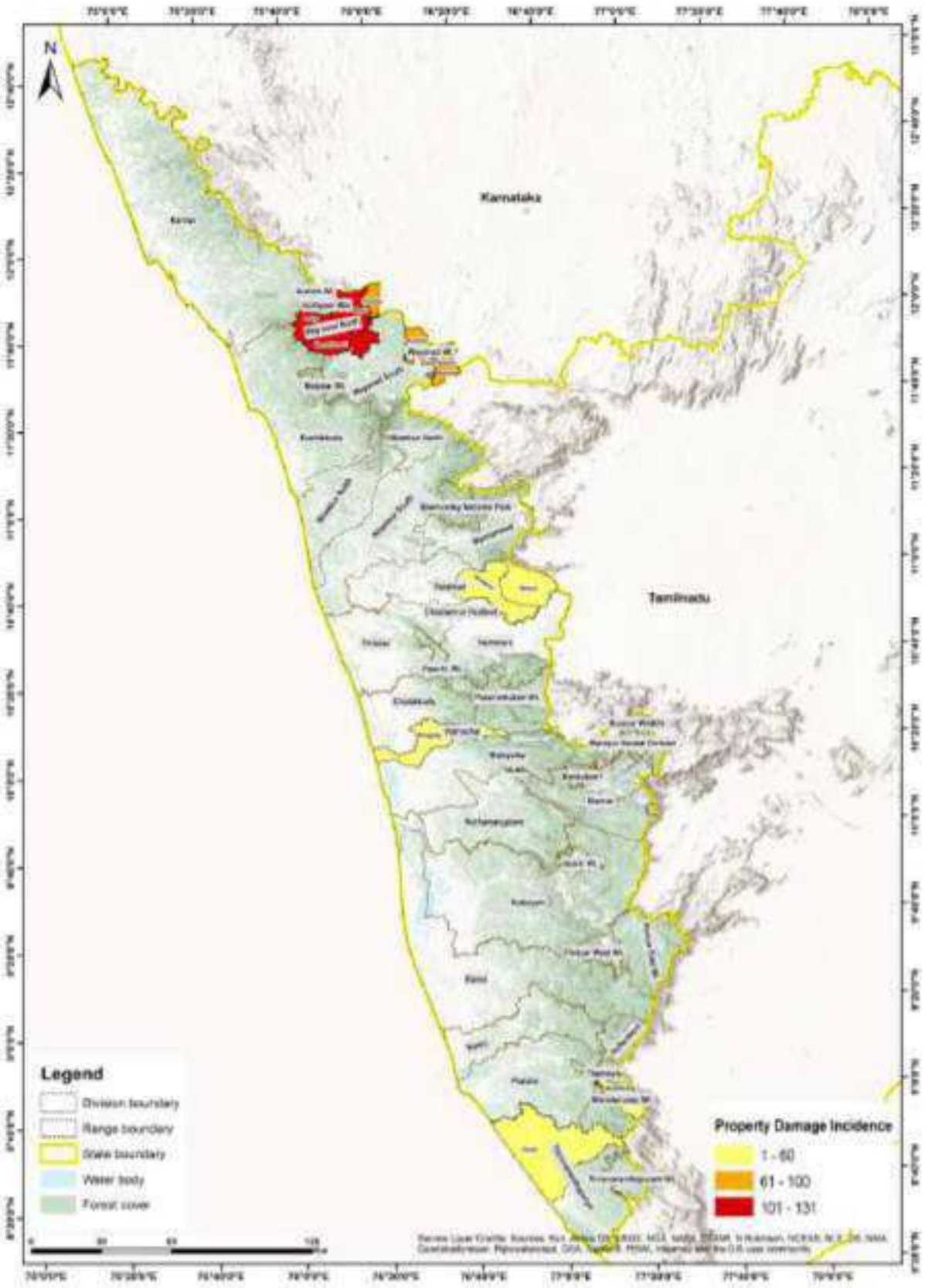



Figure 39 Ranges reporting property loss incidence during the period 2016-2020 in Kerala

## Human Death

Human death in Kerala pertaining from 2016 – 2020 has been mapped in range level with the data provided by the Forest department. A total of 26 ranges have reported 55 incidence of human deaths.

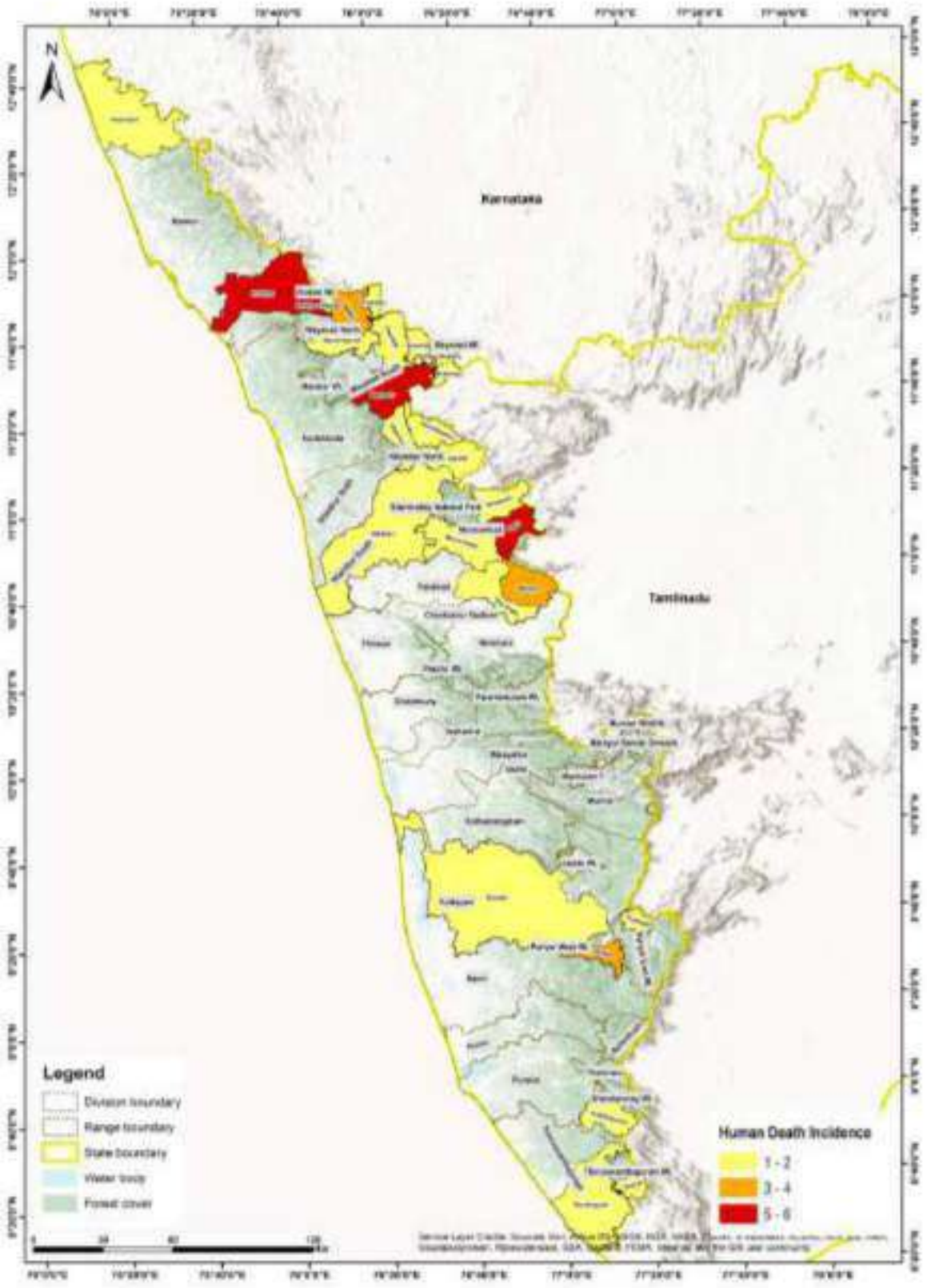



Figure 40 Ranges reporting human death incidence during the period 2016-2020 in Kerala

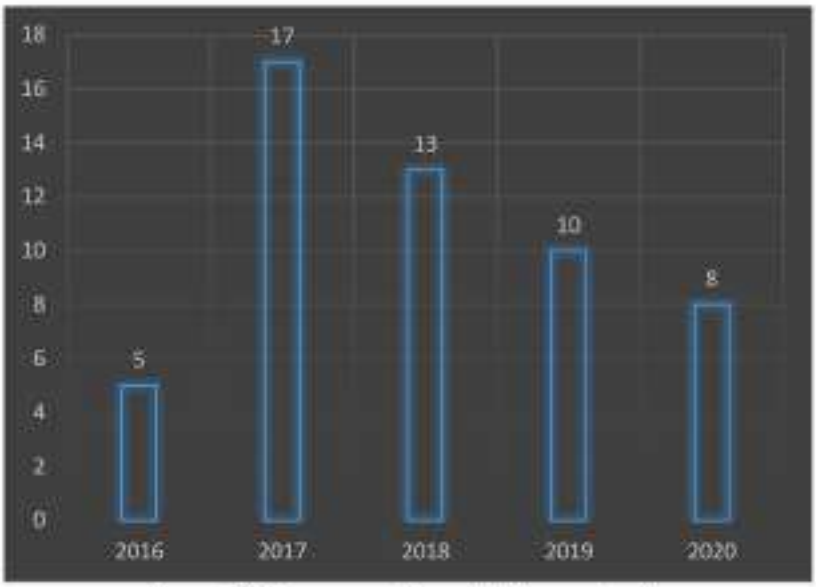



Figure 28 Inter-annual trend of Human death

During the period 2016 to 2020, the incidences of human death due to elephants increased during 2016 and 2021 and then again leveled off during 2019 and 2020 (Fig-40).

## Elephant Death

Elephant death in Kerala pertaining from 2016 – 2020 has been mapped in range level with the data provided by the Forest department. A total of 50 ranges have reported 385 incidence of elephant deaths.

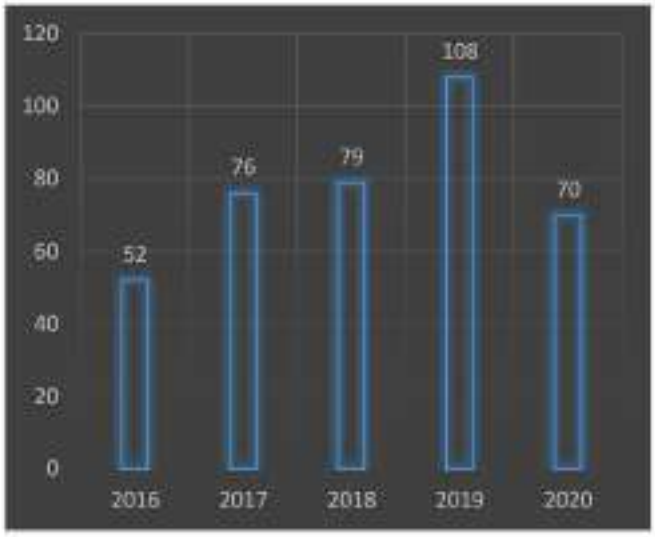



Figure 41 Inter-annual trend of Elephant death

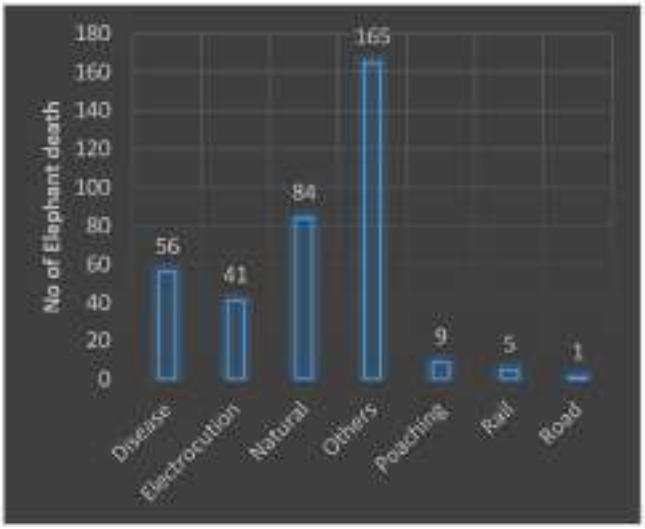



Figure 42 Cause of Elephant death

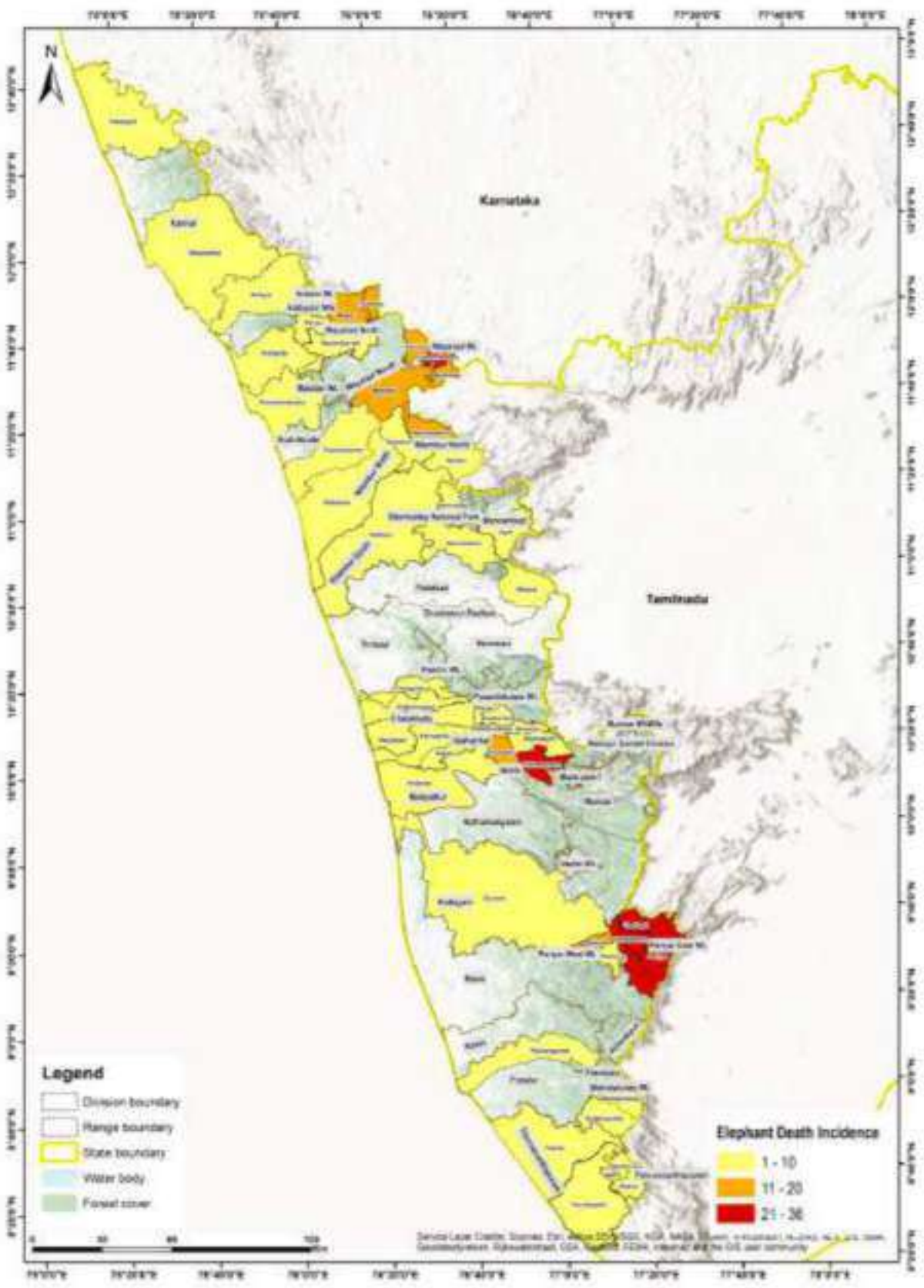



Figure 43 Ranges reporting elephant death incidence during the period 2016-2020 in Kerala

# Chapter – VII
# Nagaland

## Nagaland

Nagaland is one of the elephant bearing states in the Northeast India. As per the 2017 synchronized elephant census, the state harbours about 460 elephants (446 as enumerated during block counts). During the period 2018 – 2021, human-elephant conflict in the state was reported from 7 forest divisions across 5 districts. A total of 6 elephant deaths were reported during the period 2018-2021 and only one human death was reported during the same period.

**Table-8 HEC reported for Nagaland for the period 2018-2021**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2018 - 2021 |
| Districts affected | 5 |
| Divisions affected | 7 |
| Reported elephant death | 6 |
| Reported human death | 1 |
| Reported crop damage incidents | 68 |
| Elephant Population (as per 2017 census) | 446 |

### Crop losses

A total of 68 incidences of crop losses due to elephants were reported from 5 districts across Nagaland for the period 2016-2019. Of the five districts that reported crop losses due to elephants, the number of incidences were relatively higher in the district of Wokha (Fig-45). The intensity of crop losses seems to be increasing during the period 2018-2021 (Fig-44)

Figure 44 Inter-annual Crop loss

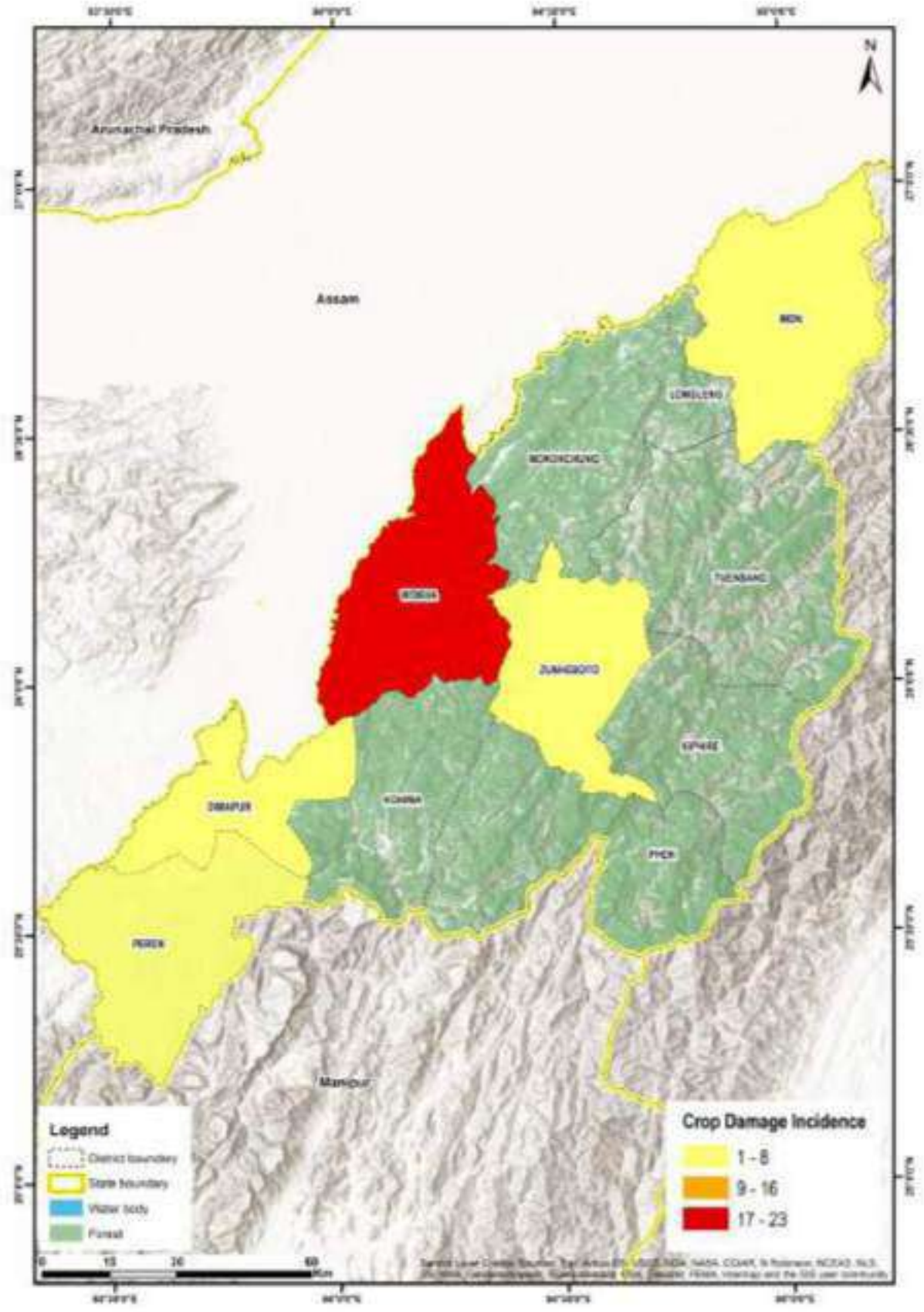



Figure 45 Ranges reporting property loss incidence during the period 2016-2019 in Nagaland

# Chapter – VIII
# Odisha

## Odisha

The state harbors about 2000 elephants (1976 elephants as enumerated during the synchronized elephant census in 2017) representing about 7% of the Indian elephant population and over 70 % of the population in the East-Central region. The HEC in Odisha is one of the highest in the entire country with disproportionately high levels of human deaths in relation to its elephant population size. The state had recorded the highest number of human deaths due to HEC for the period 2017-2020. A total of 21 districts (out of the total 30 districts) that is managed under 43 forest divisions in the state reported HEC. The number of reported elephant deaths in the state is also one of the highest in the country.

**Table-9 HEC reported for Odisha for the period 2017-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2017 - 2020 |
| Districts affected | 21 |
| Divisions affected | 43 |
| Reported elephant death | 252 |
| Reported human death | 1045 |
| Elephant Population (as per 2017 census) | 1976 |

### Human deaths

Human deaths due to elephants were widespread in Odisha. A total of 292 human deaths from 104 forest ranges were reported for the period 2017-2019. The number of human deaths were relatively higher in Keonjhar, Angul and Dhenkanal forest divisions (Fig-47). The number of human deaths have been increasing over the years (Fig-46).

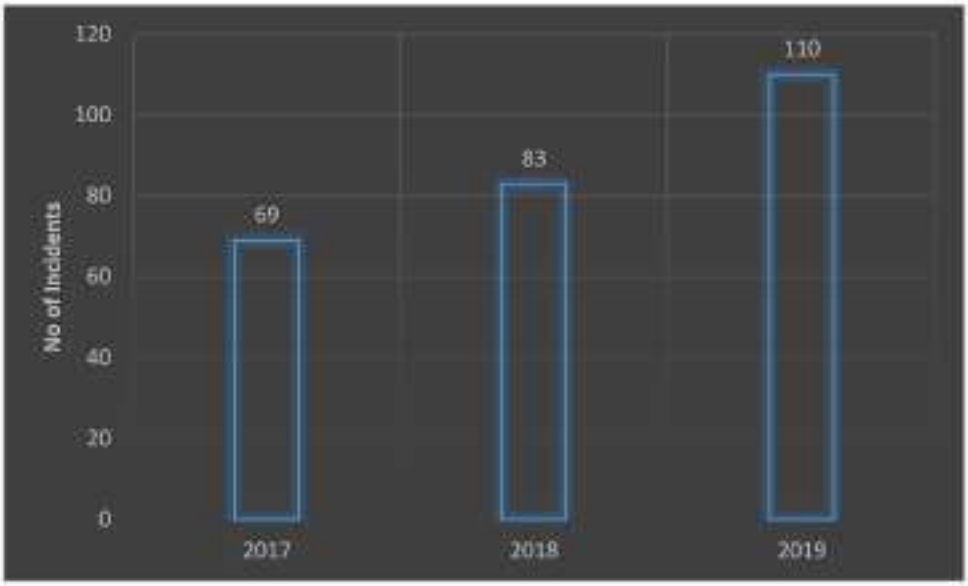



Figure 46 Inter-annual trend of Human death

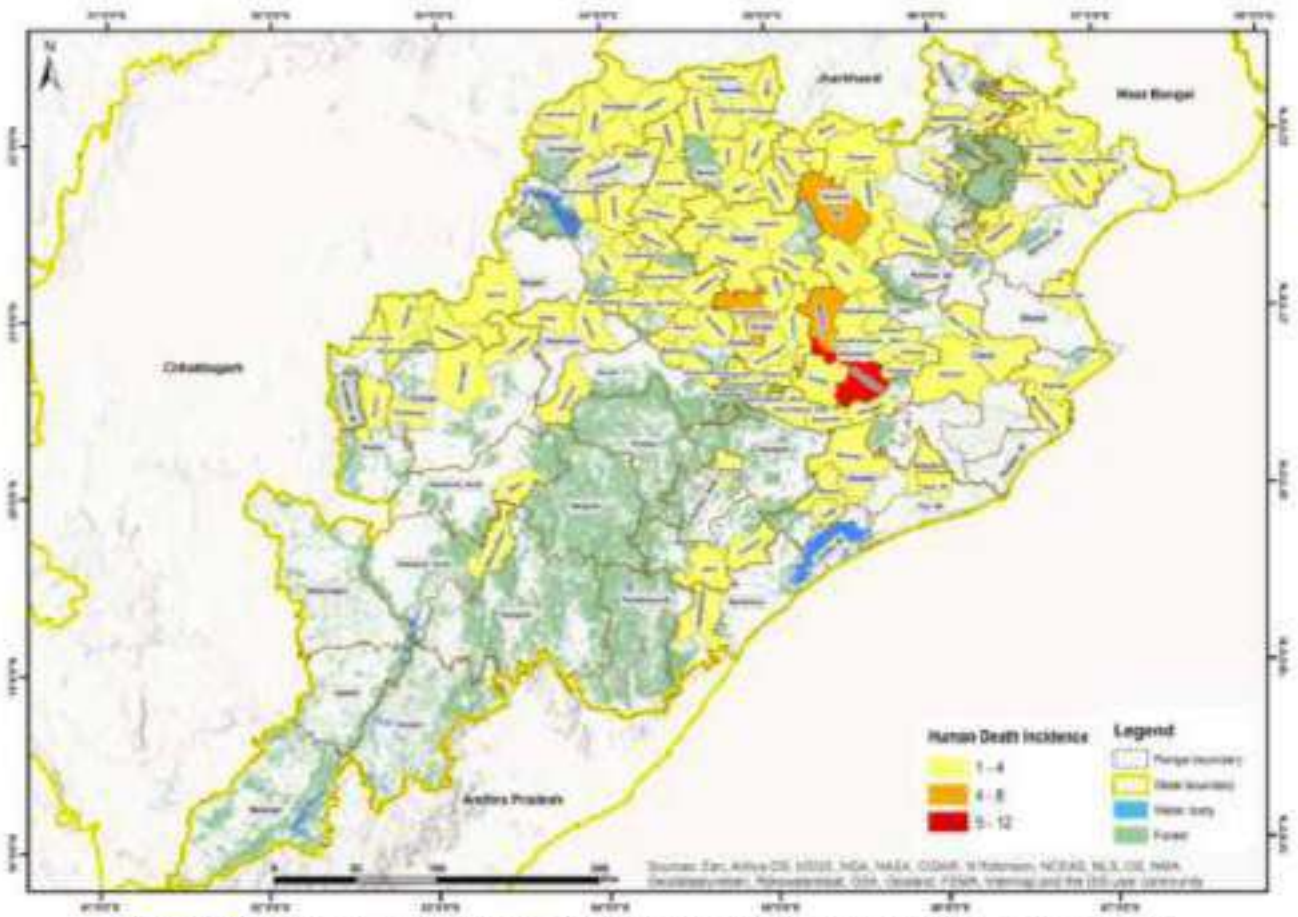



Figure 47 Ranges reporting property loss incidence during the period 2017-2019 in Odisha

## Elephant deaths

A total of 252 elephant deaths due to a variety of reasons (Fig-50) from 88 forest ranges were reported for the period 2017-2020. The elephant deaths were spread out throughout the state with major concentration in the north, central and western regions of the state (Fig-49). The number of elephant deaths have been increasing over the years (Fig-48). The Dhenkanal range of Dhenkanal forest division in the central Odisha had reported relatively higher number of elephant deaths in the state (Fig-49).

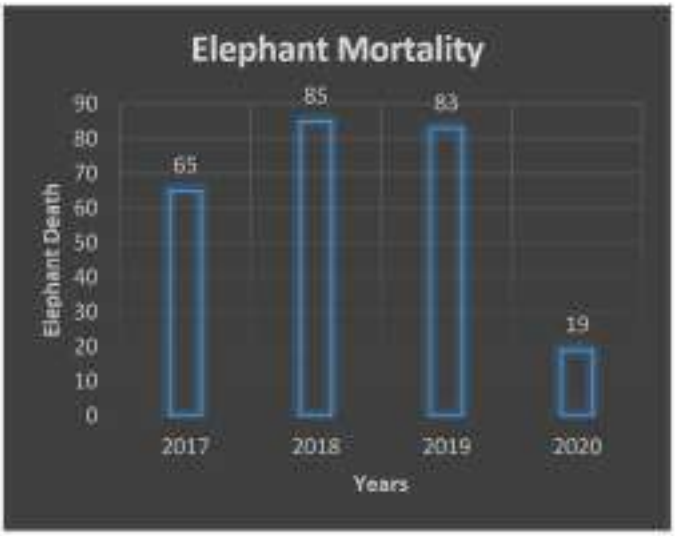



Figure 48 Inter-annual trend of Elephant death

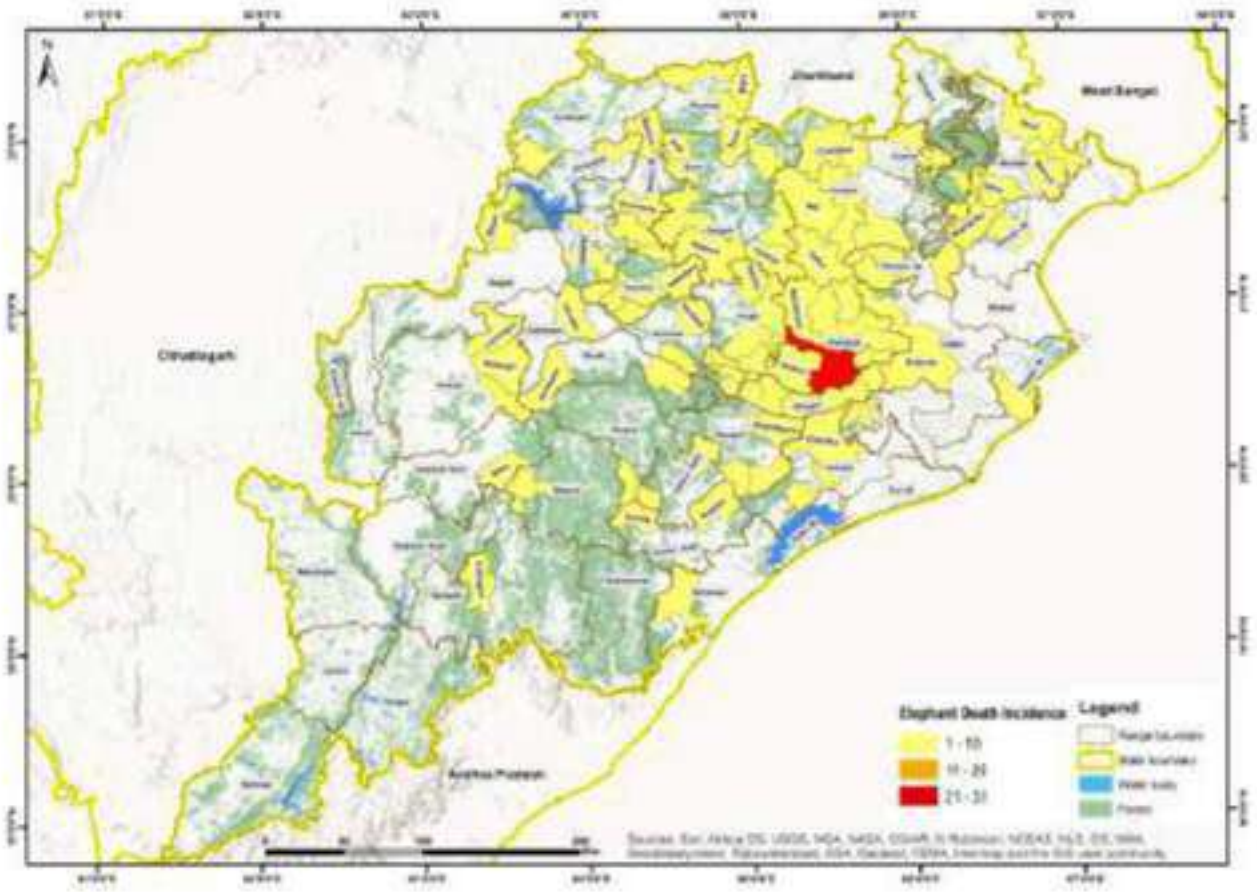



Figure 49 Ranges reporting property loss incidence during the period 2017-2020 in Odisha

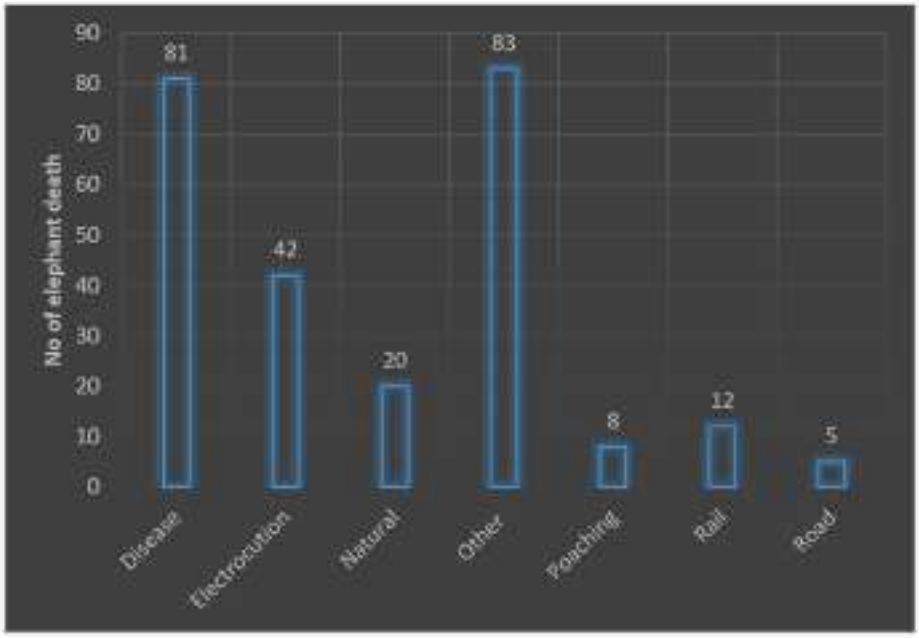



Figure 50 Cause of elephant death

# Chapter – IX
# Uttarakhand

## Uttarakhand

In the Himalayan state of Uttarakhand, the elephants are distributed over 13 forest divisions covering 10,000 km$^2$ landscape extending from Yamuna river in west to Sarada river in East. The state harbors about 1836 elephants as per the synchronized elephant census conducted by Project Elephant and Uttarakhand Forest Department during the year 2017.

The HEC data obtained from Uttarakhand forest department pertains to the period 2015 – 2020. The data comprises of information only on human and elephant deaths. During the period 2017-2020, HEC in the form of human and elephant mortalities was reported 8 districts encompassing 13 Forest Divisons (Table-10).

**Table-10 HEC reported for Uttarakhand for the period 2015-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2015-2020 |
| Districts affected | 8 |
| Division affected | 13 |
| Reported elephant death | 154 (2015-2020) |
| Reported human death | 47 (2015-2020) |
| Elephant Population | 1839 |

### Human deaths

During the period 2015-2020, 47 incidences of human deaths due to elephants were reported from 7 divisions in the state has been mapped in division level. There were inter-annual fluctuations in the number of human deaths during the period (Fig-51).

Figure 51 Inter-annual trend of Human death

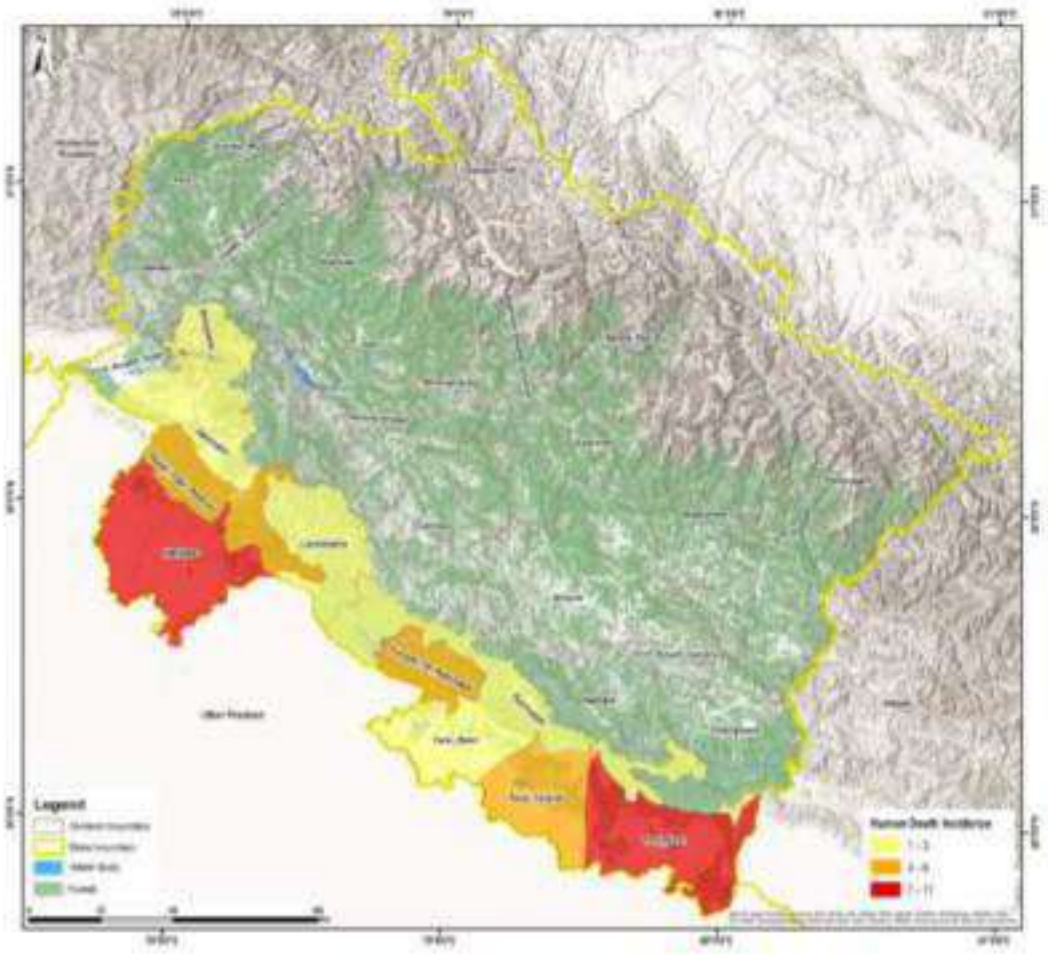



Figure 52 Divisions reporting Human death incidence during the period 2015-2020 in Uttarakhand

## Elephant Death

Elephant death in Kerala pertaining from 2015 – 2020 has been mapped in range level with the data provided by the Forest department. A total of 52 ranges have reported 154 incidence of elephant deaths due to various reasons(Fig-55).

Figure 53 Inter-annual trend of Elephant death

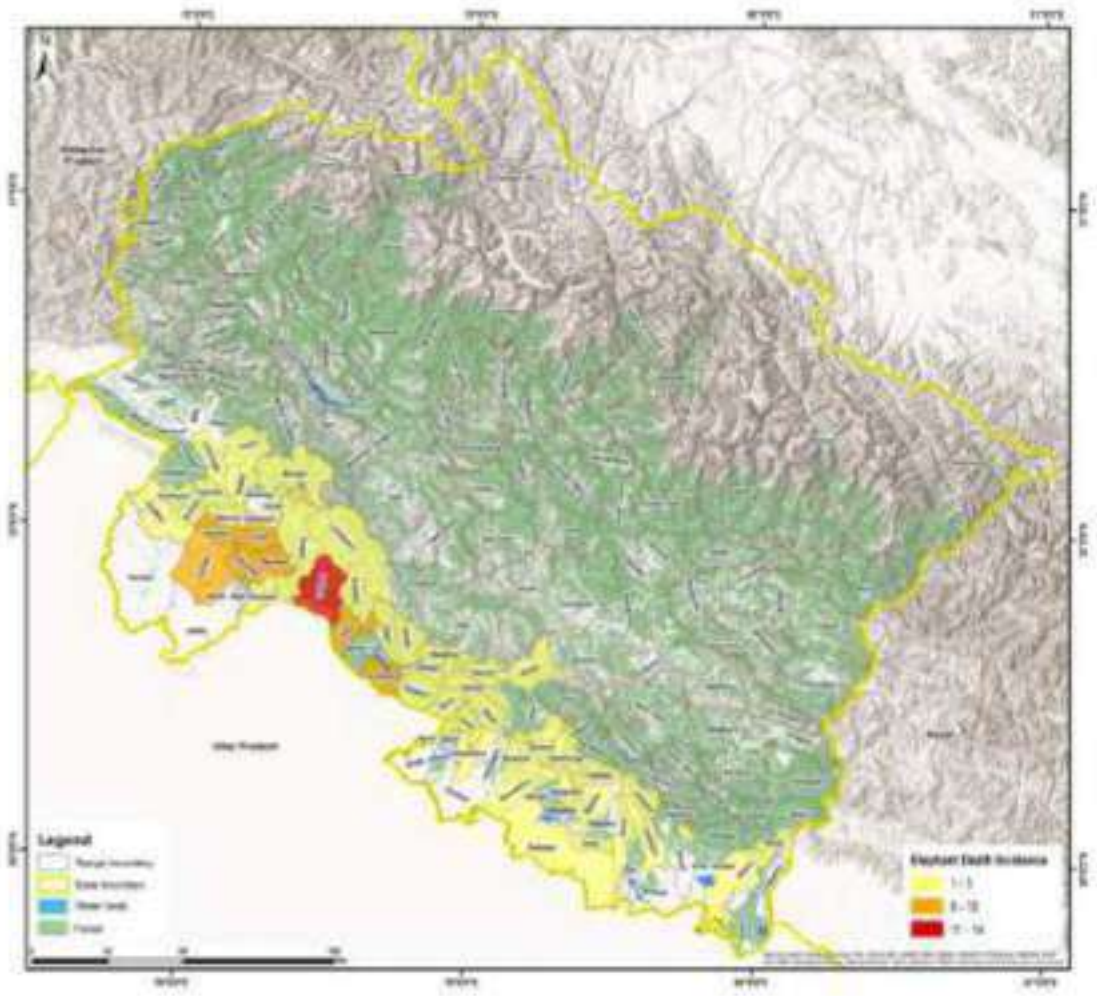



Figure 54 Ranges reporting Elephant death incidence during the period 2015-2020 in Uttarakhand

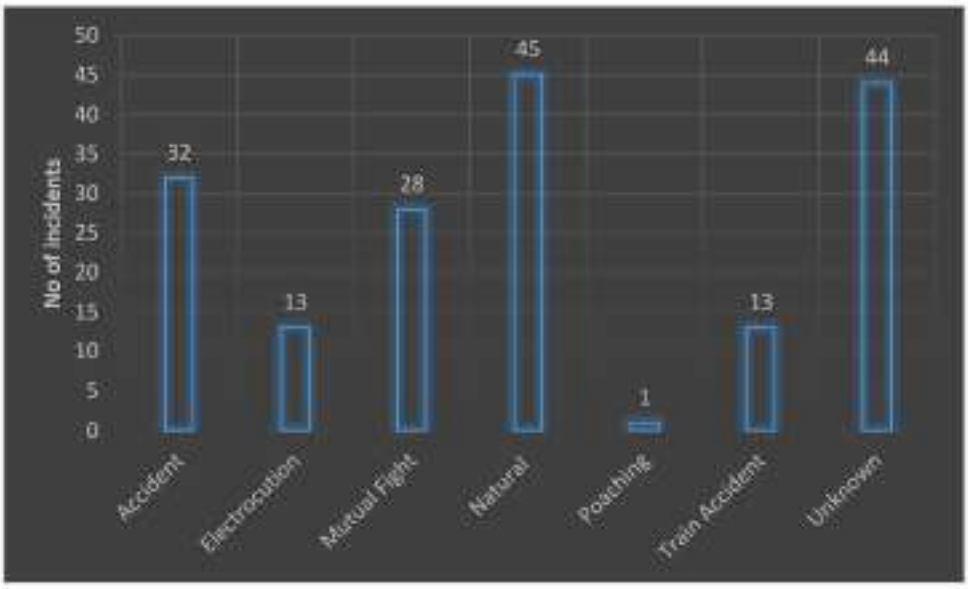



Figure 55 Cause of Elephant death

# Chapter – IX
# West Bengal

## West Bengal

The state of West Bengal has two distinct elephant populations: one in the north along the Himalayan foothills and the other in south in the inter-state junction of WB, Jharkhand and Odisha. The number of elephants and the intensity of HEC differ between the two regions. As per the estimates of synchronized elephant census of 2017, there are around 185 elephants in South Bengal and around 510 elephants in North Bengal. The South Bengal elephant are part of the east-central regional elephant population whereas the elephants in North Bengal are part of the northeastern regional elephant population. The intensity of HEC is high in both North and South Bengal. In total, 8 districts administered as 14 forest divisions in the entire state of West Bengal report HEC. The HEC data presented pertains to the period 2017-2020.

**Table-11 HEC reported for West Bengal for the period 2017-2020**

| Particulars | Details |
|---|---|
| Period of reported HEC | 2017 - 2020 |
| Districts affected | 8 |
| Divisions affected | 14 |
| Reported elephant death | 92 |
| Reported human death | 202 |
| Elephant Population (as per 2017 census) | 714 |

### Human deaths

During the period 2017-2020, 202 incidences of human deaths due to elephants were reported from 4 divisions in North Bengal and 3 districts in South Bengal. There were inter-annual fluctuations in the number of human deaths during the period (Fig-56).

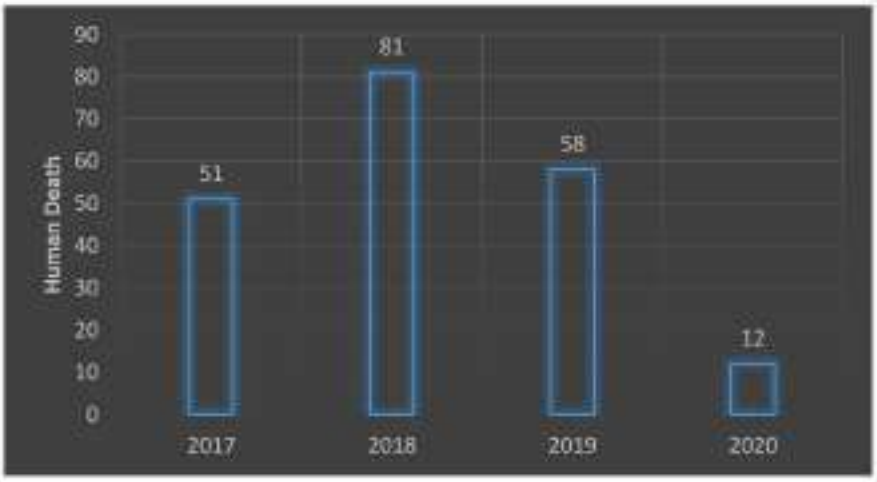



Figure 56 Inter-annual trend of Human death

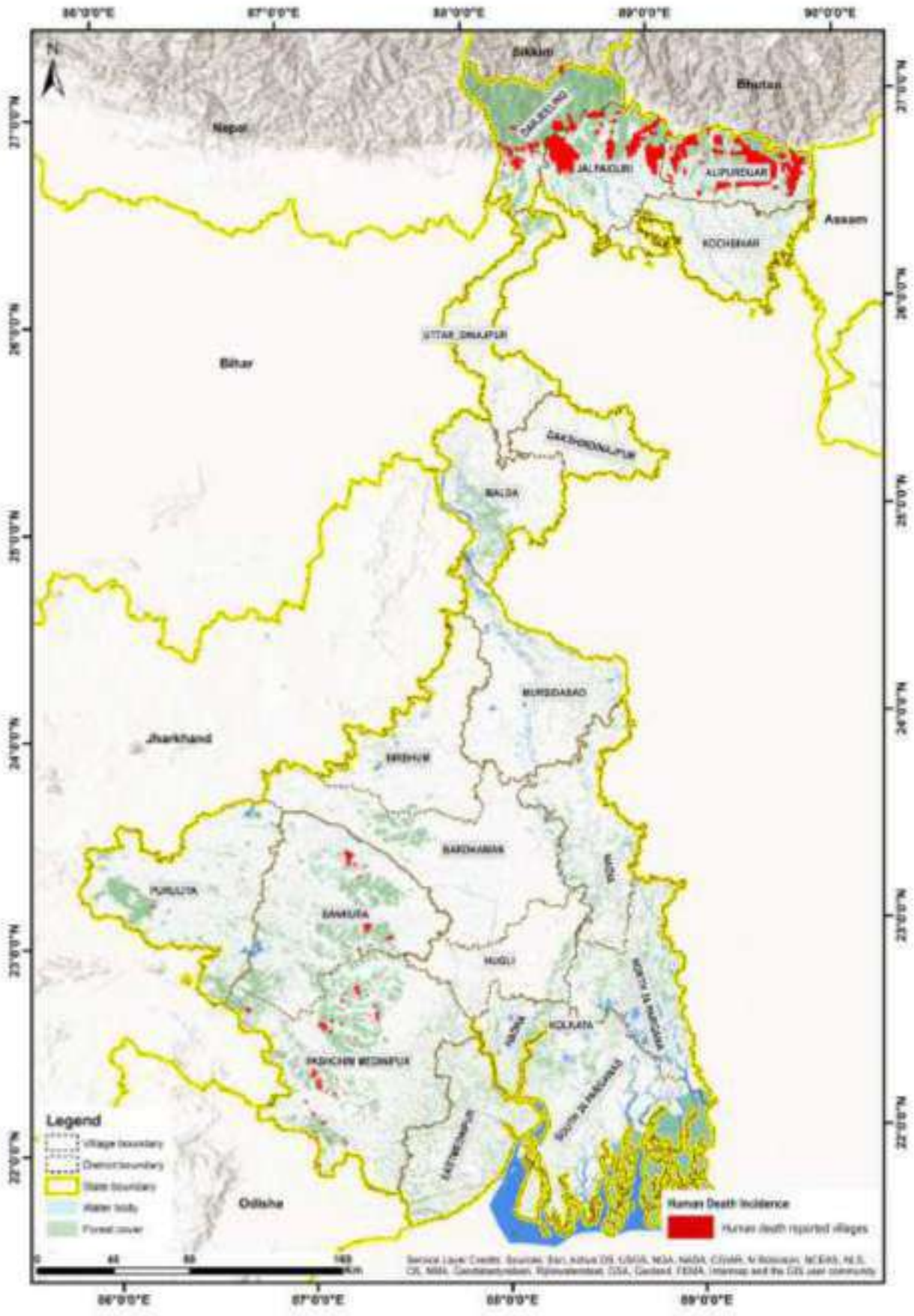



Figure 57 Villages reporting property loss incidence during the period 2017-2020 in West Bengal

## Elephant death

Across the state, 92 elephant deaths were reported from a total of 64 villages across five districts. The causes for elephant mortality have been provided in Fig-60.

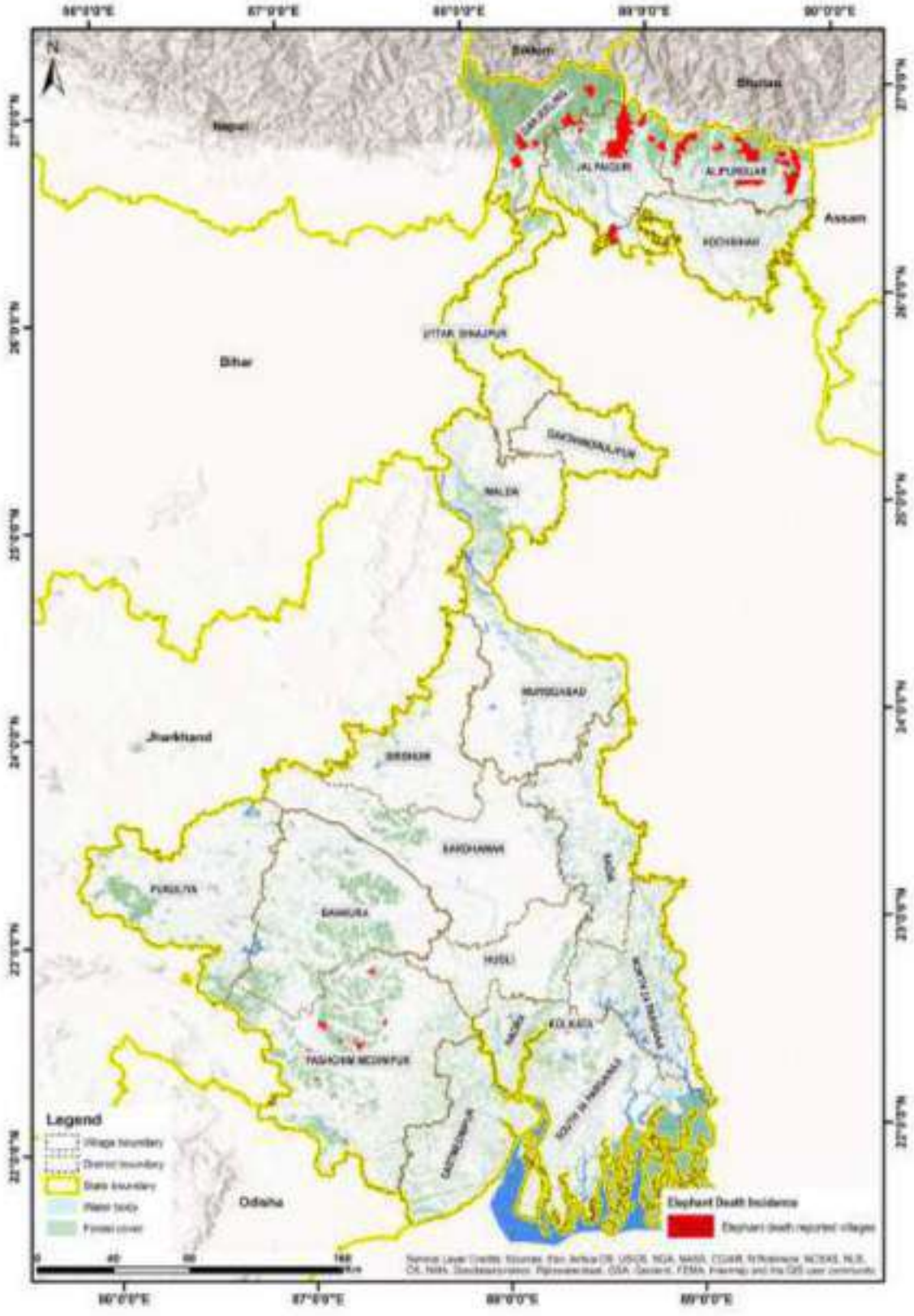



Figure 58 Villages reporting property loss incidence during the period 2017-2019 in West Bengal

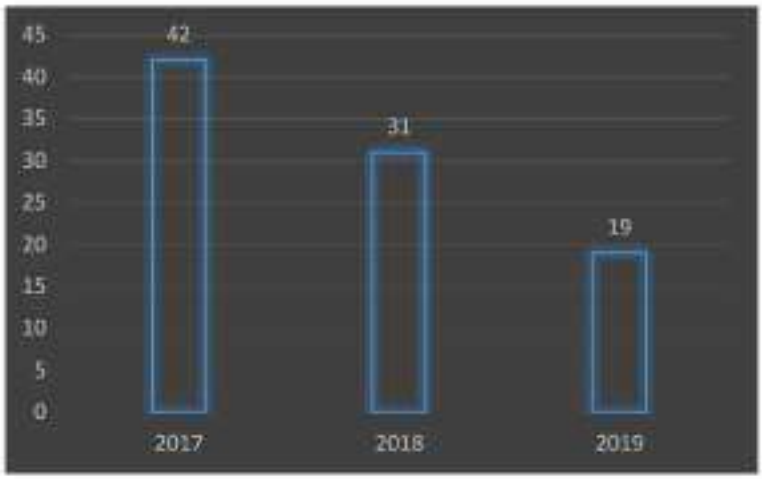



Figure 59 Inter-annual trend of Elephant death

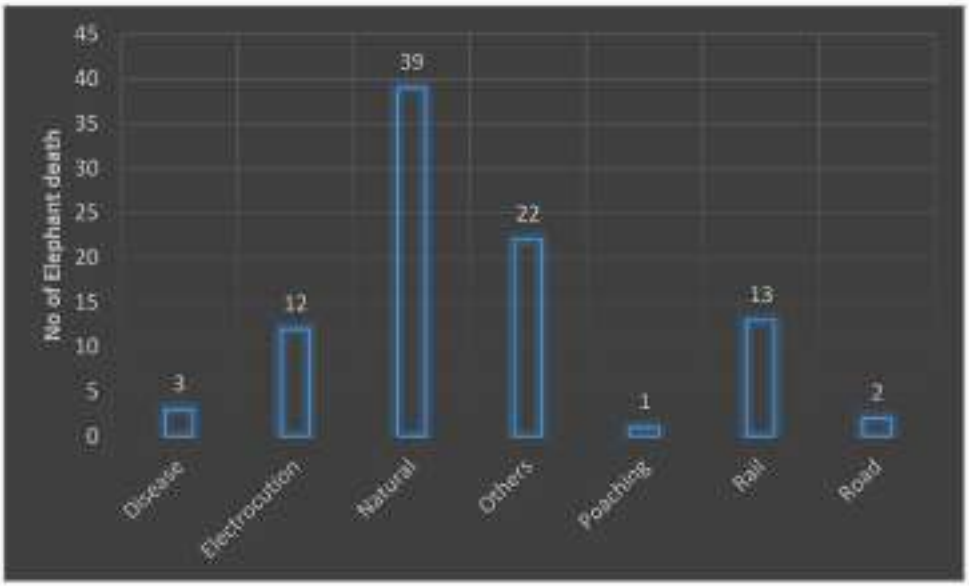



Figure 60 Cause of Elephant death

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Director
Wildlife Institute of India
Post Box No# 18, Chandrabani
Dehradun, 248001, Uttarakhand, INDIA
Email: wii@wii.gov.in

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

# Human Wildlife Conflict in Wayanad District, Kerala and Gudalur District, Tamil Nadu

## Site Appraisal Report (13-15 March 2024)

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

SACON

# Human Wildlife Conflict in Wayanad District, Kerala and Gudalur District, Tamil Nadu

## Site Appraisal Report (13-15 March 2024)


### Team Members

Ms. Harini Venugopal, AIG NTCA Regional Office, Bangalore

Dr. K. Ramesh, Scientist-F, Wildlife Institute of India

Dr. N. Lakshminarayanan, Scientist, Elephant Cell, Wildlife Institute of India

Dr. P.V. Karunakaran, Senior Principal Scientist, SACON

Dr. S. Babu, Senior Scientist, SACON

## Background:

Recent incidents of human wildlife conflicts in the form of human deaths caused by elephants and tigers evoked public outcry and political response. As swift action, the Hon'ble Minister of Environment, Forest and Climate Change visited Wayanad, Kerala between 21-02-2024 and 22-02-2024, apprised the field situation, held detailed discussions with the political representatives in Wayanad, District Administration, Forest Department officials and also visited the family members of the victims. Further, the Hon'ble Minister promulgated the following policy decisions in response to the human-wildlife conflict situation at Wayanad:

i. The Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore, which is now under the Wildlife Institute of India (WII), will be developed as a Centre for handholding the south-Indian States like Andhra Pradesh, Karnataka, Kerala and Tamil Nadu on matters pertaining to mitigation of human-wildlife conflicts.

ii. Considering the urgent need to have better cooperation, coordination, and collaboration on wildlife issues amongst all the Southern States, inter-State coordination meetings would be convened at regular intervals. The Ministry of Environment, Forest and Climate Change will facilitate such inter-state coordination meetings.

iii. The Ministry of Environment, Forest and Climate Change will actively support capacity building of frontline staff and other frontline departments for use of early warning systems, use of modern technology and equipment, and modern tracking systems.

iv. Based on the demand/ Annual Plan of Operations proposed by State Government, the Central Government will consider funding support under CAMPA and other schemes for site-specific mitigation measures.

v. The Central Government through Wildlife Institute of India will assist in preparing corridor management plan in Kerala, Karnataka and Tamil Nadu.

vi. At certain site-specific locations, barriers like the elephant-proof fences may be created. The State Governments may request for funding support from Central Government under CAMPA and other schemes.

vii. The Central Government has enhanced ex-gratia payment from Rs 5.0 Lakh to Rs 10.0 lakh on human fatalities. The payment of ex-gratia has to be done by the State Governments immediately and on a transparent manner. A suitable mechanism and protocol have to be developed by the State in a transparent manner.

viii. Regarding the permission for capturing, translocating or hunting of wild animals for mitigating human wildlife conflicts, the Hon'ble Minister informed that Section 11 of the Wildlife (Protection) Act, 1972 empowers the State Chief Wildlife Warden of the State to take such actions required to manage human wildlife conflicts.

Accordingly, the Ministry of Environment, Forest and Climate Change (MoEFCC) vide Letter F.No. WL-8/8/2024-WL dated 1/03/2024 communicated Director, Wildlife Institute of India the following:

1. Handholding of the States of Kerala, Karnataka and Tamil Nadu by Wildlife Institute of India's southern Centre-SACON, by deputing scientist(s), who have some experience of working in southern landscape, to work on a regular basis in these States.

2. Building capacity of the frontline staff in these states, especially with respect to use of early warning systems, modern technology and advanced tracking systems for better management of human wildlife conflict situations in these areas.

3. Assisting in preparation of corridor management plans in the States of Kerala, Karnataka and Tamil Nadu.

Subsequently, a meeting was held on 06th March 2024 at MoEFCC on the above points, and was decided that (1) there would be field visits/consultations in the southern states including Waynad for stock-staking of the situation, and (2) develop strategies to set up the Centre for Human-Wildlife Interface Management (CHWIM) at SACON with the support of faculty member(s) from Wildlife Institute of India. This proposal was aimed at developing this Centre as announced by the Hon'ble Minister of Environment, Forest and Climate Change, Government of India. Accordingly, Director, WII communicated to the CWLWs of the three southern states that a team of experts/representatives from WII, SACON and NTCA would be visiting Wayanad and neighboring areas during 13-15 March 2024 to briefly assess the conflict situation and apprise the MoEFCC on the same. The team comprised of:.

(1) Ms. Harini Venugopal, AIG NTCA Regional Office, Bangalore

(2) Dr. K. Ramesh, Scientist-F, Wildlife Institute of India

(3) Dr. N. Lakshminarayanan, Scientist, Elephant Cell, Wildlife Institute of India

(4) Dr. P.V. Karunakaran, Senior Principal Scientist, SACON

(5) Dr. S. Babu, Senior Scientist, SACON

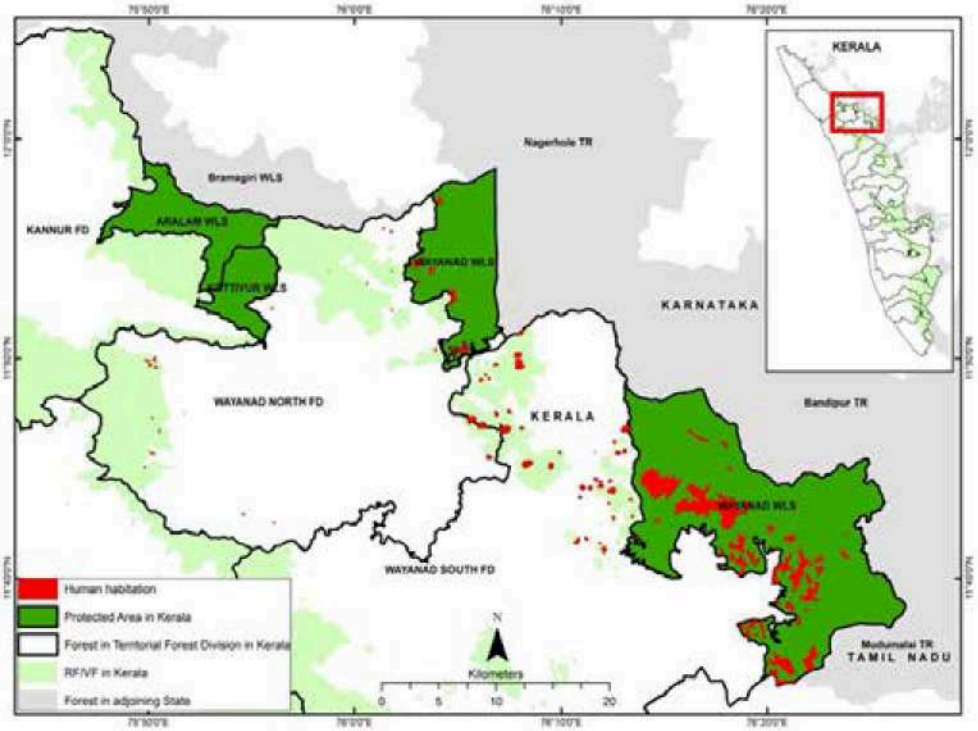
**Description of the Wayanad landscape in Kerala:** The Wayanad District is located in the northwest part of Kerala, bordering Karnataka and Tamil Nadu, making it a part of the larges landscape complex in Nilgiri Biosphere Reserve. The habitat for large mammals like elephants and tigers in the Wayanad landscape is diverse representing a dry–moist continuum comprising deciduous forests in the east and moist evergreen, shola and grassland habitats in the west. The Wayanad plateau of the Western Ghats is hilly with profound altitudinal variation. The Wayanad district has three major forest administration units namely (1) Wayanad WLS (comprising Muthanga and Tholpetty Wildlife Sanctuaries), (2) North Wayanad Forest Division and, (3) South Wayanad Forest Division.

**Schedule of Activities / Appraisal Visit:** The team travelled to Wayanad on 13th March 2024 and held brief discussion among the team members. On 14th March 2024, detailed discussions were held with Wildlife Warden, Wayanad WLS Shri. Dinesh, IFS; DFO North Wayanad Shri. Martine Lowel; and DFO, South Wayanad, Ms. A. Shajna along with all Range Officers and Biologists (Annexure-1). It was an intense discussion, aimed at picking up on the actual status of situation, current and historic perspectives on animal distribution and movement, socio-political aspects of human-wildlife conflict including public opinion and participation, resource adequacy, veterinary aspects, and the trends and patterns of the human-wildlife conflict. During the discussion, the opinion of field-level officers on addressing the specific gaps pertaining to human-wildlife conflict resolution both in the present and in the long-term were obtained.

Following the discussion, the team visited various parts of Wayanad district on 14/03/2024 and 15/03/2024 where the conflict potentials were reportedly high.

1. **Beenachi estate, Sultan Bathery:** This 554-acre plantation currently under the Madhya Pradesh Government is in Sultan Bathery. The plantation supports wildlife including occasional movement of tigers, elephants, gaur and other mammals.

2. **Panavalli, North Wayanad:** This village and surrounding areas are in the vicinity of Tholpetty Wildlife Sanctuary and Nagarahole National Park in Karnataka. The area supports regular movement of animals between Wayanad and Brahmagiri and lies in the catchment of the Kabini river.



3. Appapara forest station, Thirunelli: The Appapara forest station is in Thirunelli of Begur range. The Thirunelli-Kutharakote elephant corridor, which is extensively used by elephants following restoration is close to Appapara forest station. At Appapara forest station, the team had an elaborate discussion with the forest staff on duly. The team was apprised about the real-time movement register maintained by the field staff to track elephant movement in the area.

4. Animal Hospice and Rehabilitation Centre, Chedalath: The team visited the tiger enclosures in the animal hospice and rehabilitation centre where tigers that were caught for various conflict-related reasons were kept in captivity. In the rehabilitation centre, the team had a detailed discussion with the Forest Veterinary Officer Dr. Ajeesh.

5. Begur-Brahmagiri Elephant Corridor, Kutta: This critical corridor lies in the interjunction of Wayanad WLS, Nagarahole NP and Brahmagiri WLS. The team visited the corridor and also looked at issues like creation of EPT by the estates, which could hinder elephant movement. The team also discussed on issues such as proliferation of *Senna spectabilis* and other invasive plants, drying up of streams and others with the field staff.

6. Chundakolli village, Sultan Bathery: On 16th March 2024, the team visited Chundakolli in Irulam village and discussed on issues such as proliferation of private fences in the landscape and also individual houses, where potential encounters with elephants, tigers and other wildlife are high.

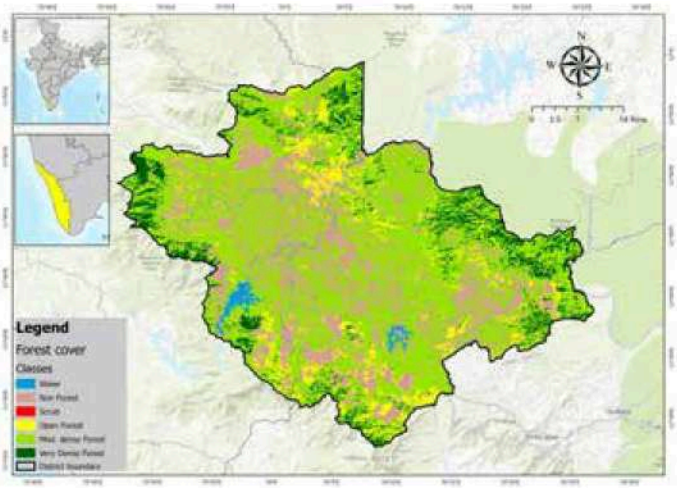
7. Mylambadi in Krishnagiri village of Meenangadi panchayat: The team visited the site from where a young tiger was captured a few days ago. The cattle and livestock sheds in the village were examined and brief discussions were held with a villager Shri. Biju Kuriakose. It was learnt that another tiger had visited the goat pen a night before despite the fact that a tiger was already captured by the Forest Department.

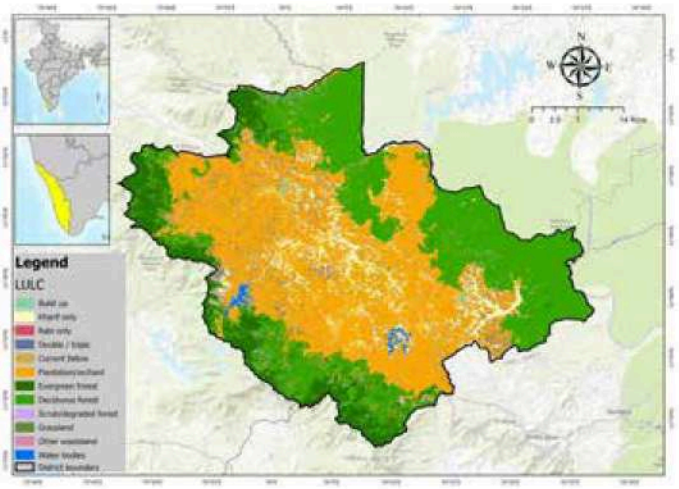
8. Meppadi range, South Wayanad: The team visited the Range Office, Meppadi. The range is in the interjunction of Mudumalai WLS and Gudalur FD of Tamil Nadu. The team had elaborate discussion with the range staff along with the DFO, South Wayanad.

After visiting sites of importance in the Wayanad district, the committee went to Gudalur Forest Division in the neighboring Tamil Nadu state.

9. Gene Pool, Nadugani, Gudalur Forest Division: Even on the day of team visit, there was an incident of human death caused by elephants in O'Valley range of Gudalur Forest Division. Elaborate discussions were held with the field staff of the Gudalur Forest Division on wildlife movement, human-wildlife conflict, encroachment issues (section-17 lands in the division), unsurveyed areas and intiatives to address human-wildlife conflict in the division. The field staff reported recent tiger movement including of family groups in human dominated areas.

Observations and Inferences: Wayanad Division represents mosaic of forest and human habitations including large area of coffee plantations. The boundary between forest and human-use areas is diffuse, and therefore, poses a challenge for management as wild animals range extensively across fuzzy boundaries. Over the years, the landscape has changed with reduction in agriculture area resulting in rank growth of secondary scrub, and large area of plantation mosaics, offering good cover and facilitating animal movement more frequently.




At the outset and taking into consideration the number of conflict incidents, the situation of heightened crisis stems primarily from increased wild animal sightings and regular incidences of cattle lifting by large carnivores in the area. Though the conflict incident per say is comparable with other areas in the country, the probability of animal sighting is high as the Wayanad-Mudumalai-Bandipur-Nagarahole complex is inherently wildlife rich supporting the largest populations of elephants and tigers in Asia and thus, such frequent sightings seem to have influenced the negative perception of people. While there is strong civil society group operating there such as KIFA (Kerala Independent Farmers Association), which reportedly promotes a total elimination of animals from human-use areas regardless of actual conflict, there is reportedly no active involvement of conservation and technical institutions to work as an interface between people and the Forest Department, although some NGOs have been working on securing corridors. The Forest Department receives adequate support from the Police, but there is increased local demand for trapping straying tigers. The Forest Department would require support on better infrastructure and equipment for executing safe capture operations. More importantly, the department would require a robust support system that enable taking decisions on issues such as capture of animals (where, when and why) and sites for potential release of the captured animals. There is also lack of knowledge on tiger and elephant movement at the landscape-level (including that of neighboring states), and thus, data sharing with neighboring states needs support. Although

elephant-related deaths are more, tiger related conflicts including livestock depredation evokes stronger response. Although the conflicts are widespread, there are ranges in both Wayanad North and Wayanad South where the conflict incidences are relatively high. Use of technology is warranted, but needs to be executed subtly and professionally, as there has been past experience of panic and over reaction by the people.

Taking cue from the above narratives/expressions by different people, reading of maps and field visits, the following specific observations were deduced:

(1) The configuration of forest and other land-uses offers mosaic of habitat with adequate and water sources, facilitating animal movement on regular basis, but there is lack of knowledge on how and when the animals are moving within the landscape. The animals tend move through several barriers/bottle necks, but the precise nature of the movement is not known.

(2) In comparison to conflict incidents in other parts of the country, the situation in Wayanad appeared exceptional in terms of higher probability of animal sightings (tiger, elephant, leopard, etc.). As Wayand is integral part of the Nagarahole-Bandipur-Mudumalai-Wayanad forest complex that supports the largest Asian elephant and tiger population in the world, high frequency of sightings in the landscape in light of increased road network seems natural. Nevertheless, the factors underlying increased movement of wildlife in human-use areas needs to be understood better, considering the population growth in the neighboring states. Regardless of population increase or not, the higher probability of animal sightings with regular incidents of cattle depredation and human death causes such vigorous response from people.

(3) The density of tiger and elephant in Wayanad is high, since the area is part of Nilgiri-Eastern Ghats Landscape, which holds the largest population of Asian elephant and Tiger. This requires comprehensive understanding of spatial movement and early warning of these animals.

(4) While the forest departments in Wayanad and Gudalur are doing their best within whatever is their disposal. However, the escalating conflict situation (both real and perceived) calls for active people-department relationship through social engineering.

(5) Stray tigers and elephants are often caught or chased respectively, but the option to release the animals away from the region such in other parts of Western Ghats where the animal densities are low are being resisted, due to inadequate knowledge base on density distribution and inadequate awareness or stakeholder consultations.

(6) Wayanad has large proportion of tribals and settlers, and the response of these two are reportedly different, although the dominant groups are visible.

(7) It came to knowledge that there is a large block of around 554 acres of land owned by Madhya Pradesh Government, which is under dispute now. This particular area, if worked out suitably with Madhya Pradesh Government, can help develop controlled population management facility, which will help reduced crisis situation in the years to come.

(8) Population number such as increase or decrease in potential conflict animals does play in mind of the people. Hence, in such areas, the population estimation of animals can be provided for the entire landscape, rather than for specific locations/areas.

(10) Crop insurance policy to deal with crop damage is available, but people have not enthusiastic and at times, claims on livestock depredation have not been pursued.

(11) In the entire area of Wayanad, barriers in the form of fences have been proliferated and there are isolated households, making the animal movement restricted or unpredictable, causing heighted conflict situations.

(12) Government of Kerala allowed for hunting of wild pigs to address crop damage issue. There is a public view that is that these animals may be relocated to forest areas.

(13) Forest Department expressed the need for an institutional arrangement locally to study and map the movement of conflict animals and quickly share information among the states that have shared borders.

Recommendations: Based on the field observations and deliberations with relevant stakeholders, the following recommendations are furnished:

(1) There is a need to undertake thorough analyses of landscape configuration, change and connectivity in the region with focus on Wayanad, and this should include fine scale mapping of isolated households/villages and barriers errected by the people and department, and vulnerable entry points in the area.

(2) There is a need to increase patrolling also involving technology such as day-night drones and accordingly share communication to people in systematic way in high human use areas or public transport sites. The team that would be involved may be developed as Special Perfornance Unit (SPU) with support system to deal with capture, monitoring and public engagement.

(3) Mobile App needs to be developed and put in place so that the sighting of animals in the forest and human dominated areas may be converted into useful information to increase alert and public response to avert negative situation.

(4) There is a need to review the population data of tiger and elephant in the landscape in all three states, and map the spatial distribution and mapping of the moving animals. This can be done by SACON through NTCA Regional Office at Bengalore. This activity could also include advanced telemetry and population monitoring at regular intervals. Given the need

for regular resource flow for such activities, the Centre to be developed at SACON can also have regional units of Tiger Cell and Elephant Cell.

(5) Tecnhological solution would be critical in the landscape, but this needs prior assessment of the need and feasibility at each panchayat level, and accordingly, site specific interventions should be made.

(6) Taking into consideration the entire landscape, there is a need to develop landscape scale perspective plan with information on density distribution of problem species. Accordingly, translocation of animals for imposing negative conditioning, and also to release these animals in low density areas, including in the southern western ghats.

(7) Exclusive mapping of structual and functional corridors for elephant and tiger needs to be done, and accordingly, work towards securing these movement areas to minimise spillover effects of the conflicts.

(8) Social engineering and awareness creation at Panchayat level, involving SACON and local NGOs would be effective deal with the crisis situation and to prepare peopole to collaborate on conflict management in the region.

(9) There is hardly any facility to capture and hold the problem animals. Hence, there is a need to develop a large controlled facility in the area. The land available under the custody of Madhya Pradesh Government may be negotiated for this purpose, and this can help develop state-of-art facility to deal with conflit there.

(10) In future, any population data related to conflict animals may be discussed with local officers, and the number may be released at the landscape level, instead of site level, to avoid undue perception on the animal densities among the people's mind.

(11) The Kerala Government has brought human-wildlife conflict under State Disaster Act, but the composition of representatives in the state, district and panchayat committees may be reviewed and relevant modifications may be made as necessary.

(12) Options can be explored to offer 100% premium for crop and livestock insurance for the selected panchayats to deal with finance constraints at the time of crisis.

(13) Behaviour of problem animals need to be studied closely and local level translocations should be executed on regular basis to induce negative conditioning and also to manage the population in the human dominated area.

(14) The department requires support system in terms of capture and transportation cages/ vehicles, and these need to be customized with the help of SACON/WII, and regular hand-holding can be executed.

(15) Inter-state coordination meetings on regular basis needs to be conducted to share information on regular movement of animals, and to come up with join action under a large integrated landscape management perspective. A specific action plan or SoP for the region may be worked out in consulatation with all stakeholders.

Annexure-1: List of officials who interacted with the committee in Wayanad, Kerala

| S.No | Name and Designation |
|---|---|
| 1 | Shri. Martine Lowel, DFO, North Wayanad Forest Division |
| 2 | Shri. Dinesh, Wildlife Warden, Wayanad Wildlife Sanctuary |
| 3 | Smt. Shajna A., DFO, South Wayanad Forest Division |
| 4 | Ms. Remya Raghavan, RFO, Mananthavady |
| 5 | Shri. Ragesh. K, RFO, Begur |
| 6 | Shri. K.P. Abdul Samad, RFO, Chethayalam |
| 7 | Shri. Sunil Kumar K.P., Asst. Wildlife Warden, Tholpetty |
| 8 | Shri. Prabeesh N.K. RFO, RRT |
| 9 | Ms. Neethu K., RFO, Kalpetta range |
| 10 | Shri. Clince P. Jose, Biologist, S. Wayanad |
| 11 | Shri. Vishnu. O, Biologist, Wayanad Sanctuary |
| 12 | Shri. Ratheesh.P. D. RFO, Kurchiyat |
| 13 | Shri. Hashif, RFO, Periya |
| 14 | Shri. Sanoop Krishnan, RFO, Meppady WL Range |
| 15 | Shri. Rahul Ravindran, Wildlife Assistant, Wayanad WL |
| 16 | Shri. P.P. Vishnu, Driver, Wayanad WL |
| 17 | Shri. Rajeesh, Driver, Kurchiyat |
| 18 | Shri. R. Sajikumar, Chedalath Range |
| 19 | Shri. T. Shameer, Tholpetty Range |
| 20 | Shri. T.R. Prabeesh, Beat Forest Officer, Naiketty |

Annexure-2: List of officials who interacted with the committee in Gudalur Forest Division, Tamil Nadu

| S.No | Name and Designation |
|---|---|
| 1 | Shri. P. Karuppaiah, ACF, Gudalur FD |
| 2 | Shri. C. Veeramani, FRO, Nadugani Range |
| 3 | Shri. A. Sanjeevi, FRO, Pandalur Range |
| 4 | Shri. Suresh Kumar, Forester, Pandalur Range |
| 5 | Shri. Aneesh, Forest Guard, Nadugani Range |
| 6 | Shri. Thamba Kumar, Forest Guard, Pandalur Range |

## Snapshots of the field visit

Sálim Ali Centre for Ornithology and Natural History (SACON)
(South India centre of Wildlife Institute of India)
Thadagam road, Anaikatti, Coimbatore, Tamilnadu 641108.

Annexure-5

F. No. 14-1/2022-PE (Pt.4)
Government of India/ भारत सरकार
Ministry of Environment, Forest & Climate Change/ पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
(Project Tiger & Elephant Division / व्याघ्र एवं हाथी परियोजना प्रभाग)
*********

Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi-110003

**Dated: 26th September, 2024**

**OFFICE Memorandum**

**Subject: Proceedings of the meeting of the Southern Elephant Range States to Granulate the Components of The Regional Action Plan for Comprehensive Understanding and Management of Human Elephant Conflict in Southern India held on 5th September, 2024-reg.**

The undersigned is enclosing herewith the approved proceedings of the meeting held on 5th September, 2024 at Coimbatore, Tamil Nadu with regard to Regional Action Plan for comprehensive understanding and management of human elephant conflict in Southern India.

This issue with the approval of competent authority.

Encls: As above.

**(Dr. Rajendra Kumar)**
Scientist 'C' (Project Elephant)
Email: kumar.rajendra@gov.in

**Distribution:**

- Shri. Subhash K. Melkhede, PCCF & CWLW, Department of Forest, Government of Karnataka, Bangalore.
- Shri. Pramod G. Krishnana, PCCF & CWLW, Department of Forest, Government of Kerala, Thiruvananthapuram.
- Shri. Srinivas R. Reddy PCCF & CWLW, Department of Forest, Government of Tamil Nadu, Chennai.
- The PCCF & CWLW, Department of Forest, Government of Andhra Pradesh, Amaravati.
- Shri. Sanjay Shukla, Member Secretary, CZA, MoEFCC.
- Shri. V. Thirunavukkarasu, APCCF, CASFOS, Coimbatore
- Shri. P.C.Tyagi, IFS (Retd), Former PCCF (Apex), Tamil Nadu
- Dr. Sanjay Srivastava, IFS (Retd), Former PCCF (Apex), Tamil Nadu
- Dr. Parag Nigam, Scientist G & Nodal Officer, Elephant Cell, WII
- Dr. Bilal Habib, Scientist F & ANO, Elephant Cell, WII

**Copy to:**

- PPS to DGF&SS, MoEF&CC.
- PS to ADGF (PT&E) and MS, NTCA, MoEF&CC.
- PS to IGF (PT&E) & Director (Project Elephant), MoEF&CC.
- Dr. Dheeraj Mittal, AIGF (PT&E), MoEF&CC.

# REGIONAL ACTION PLAN FOR MITIGATING HUMAN-ELEPHANT CONFLICTS IN THE SOUTHERN REGION

**05/09/2024**
**Coimbatore, Tamil Nadu**

**BACKGROUND:**

During the 16th Steering Committee meeting of the Project Elephant held on 29/04/2022 at the Forest Research Institute, Dehradun under the chairmanship of Hon'ble Minister, EF&CC, Government of India, the Tamil Nadu Forest Department highlighted the issue of escalating human-elephant conflicts in the state, which necessitates preparing a comprehensive action plan that elucidates on aspects of effectively managing such conflicts. It was further discussed that since the elephant habitats in the southern region (and in other Indian regions too) span across state boundaries. Thus, preparing a regional action plan involving the southern states was mooted to effectively tackle escalating human-elephant conflicts. Subsequently, the Tamil Nadu Forest Department submitted a concept note to the Project Elephant elaborating on the main thrust areas the states can collectively work in the southern region through a structured "Regional Action Plan" intended to serve as a guiding document to standardize management interventions across the states. Accordingly, during the 20th Steering Committee meeting held at Raipur, Chhattisgarh on 12/08/2024, under the chairmanship of the Hon'ble Minister, EF&CC, Government of India, it was decided to conduct the Regional workshop at Coimbatore during September 2024. Accordingly, the workshop was held on 5th September 2024 at Coimbatore.

## INAUGURAL SESSION

During the formal inaugural session, **Dr. Srinivas R. Reddy, PCCF & CWLW, Tamil Nadu** provided a brief overview of elephant habitats in the southern region, especially those occurring in the boundaries along Tamil Nadu, Kerala, Karnataka and Andhra Pradesh. Dr. Reddy mentioned that the southern region harbors the largest population of wild elephants in India. The population in the region has been stable during the last few decades and there are numerous protected areas that harbor high density of elephants and other wildlife in the southern region. Dr. Reddy reiterated the overarching need for coordinated approach between the State Forest Departments in holistically addressing human-elephant conflicts in the southern region.

In his inaugural session, **Dr. Sudhanshu Gupta, PCCF & HoFF, Tamil Nadu** presented an overview on the State's rich biodiversity emphasizing on aspects like high endemism of angiosperms, creation of marine biosphere reserve and species richness of taxonomic groups like birds, reptiles and amphibians. Dr. Gupta mentioned that the State harbors nearly 3000 elephants and that the

human-elephant conflicts are escalating overtime. He mentioned that the Hon'ble High Court of Madras directed experts to come up with AI-based solutions to pressing issues like rail-related elephant deaths. Following implementation of the AI-based intensive monitoring in the critical Madukkarai Railway stretch connecting Coimbatore and Palakkad cities, over 1600 elephant crossing incidences across railway tracks were documented. Dr. Gupta mentioned that regional coordination among the states is critical and that the states can learn from each other while the Government of India can synthesize the best practices in conflict management.

**Dr. Gobind Sagar Bhardwaj, MS (NTCA) and ADG (PT&E)** mentioned that elephant is adored in India's mythology and religion. Ecologically, the species plays a critical role and serve as keystone species. Dr. Bhardwaj mentioned that the combined threats of habitat loss, fragmentation, poaching and escalating human-elephant conflicts are main thrust areas that states need to actively work together to advance lasting solutions. Pointing out the background of a recent incident involving death of a young cow elephant due to fireballs, Dr. Bhardwaj mentioned that the sometimes in many instances unruly mob behaviour may be the main cause of such incidents. Drawing from such incidents, Dr. Bhardwaj mentioned that standard operating procedures for managing mob/crowd is the need of the hour in certain high conflict areas. He further mentioned that the human-elephant conflicts are poised to increase as population of both the species is increasing and that active interstate coordination can address many site-specific issues on time.

The guest of honor **Shri. Jitendra Kumar, DGF&SS, Government of India** stressed the need to make the best regional plan to safeguard region's large elephant population. He mentioned that unlike most other Asian countries, India maintains relatively intact wildlife and also sustained wildlife populations as exemplified by the world forestry report, which even suggests increase in India's forest cover. India's forest cover is also inherently rich in biodiversity. Shri. Kumar mentioned that India's major efforts towards conservation have always been successful. Cheetah relocation, Project Tiger (later NTCA), and Project Elephant are all successful Government initiatives towards conservation. Over 150 elephant corridors have been identified by the Project Elephant. The human-elephant conflicts have increased causing hardship to both people and elephants. The Ministry has been in the forefront to help the states in addressing the issue. Many advisories and resource materials appropriate for the field officials have been issued during the last few years. The Wildlife Protection Act (1972) is also suitably amended to further empower the CWLWs. Through a robust regional action plan we should collectively take up effective conflict management to foster elephant conservation.

As part of the inaugural program, Dr. Dheeraj Mittal, AIG (PT&E), Government of India proposed the vote of thanks.

## REGIONAL ACTION PLAN: PERSPECTIVES FROM THE STATES

**1. Setting the Context for Preparing the Regional Action Plan for HEC Management in the Southern Region: *Dr. V. Naganathan, APCCF (Wildlife), Government of Tamil Nadu.***

- Dr. Naganathan provided the genesis of formulating the regional action plan for the southern region, which supports the largest elephant population in the country. He said that the Hon'ble Minister, EF&CC, Government of India has accorded in principle approval for having a regional action plan and the process has been evolving for the last two years. Among the myriad challenges facing the management, expansion of elephant range is overriding as most of it is happening outside of the forests resulting in acute HEC. The population status in the southern region is better known as the states have been religiously conducting the population estimation exercise, and that too synchronously. In the present, there are about 3063 elephants in Tamil Nadu, around 6390 in Karnataka, around 1800 in Kerala and about 100 in Andhra Pradesh. There are 12 Elephant Reserves in the southern region.
- As far as HEC is concerned, crop raiding, property losses and human deaths have all increased recently. Retaliatory killing of elephants have also increased. In particular, electrocution has emerged as a major threat facing elephants. Adding to the problem is physical infrastructure related elephant deaths such as rail collisions.
- While barriers are widely used, their efficacy remains dubious. Barriers have also deflected HEC into new areas presenting novel challenges. Active measures such as elephant drives, although inevitable in some cases, are making elephants aggressive towards people creating a vicious cycle. Land-use changes around the reserves have been rapid and unmanageable. This land-use change is disrupting traditional corridors and rendering elephant habitats insular.
- Essential considerations while drafting the Regional Action Plan include:
    - High mobility of elephants with home ranges spanning over 600 km2 often extending across the states
    - While states are already coordinating with each other on day-to-day matters, active involvement of the Project Elephant and the MoEFCC is required to identify and deliberate on long-standing issues. It is also required for bringing in uniformity in management approaches.
    - The Regional Action Plan should particularly deliberate on the interstate corridors, which are numerous in southern region. Similarly, some of the corridors occurring within one state may be more essential for the neighboring state. The Pununjuru-Kolipalaya corridor in BRT and Sathyamangalam is an example. Similarly, the Thirunelli corridor in Kerala is more critical for Karnataka than for Kerala itself. Thus, holistic corridor management assumes critical

importance and should be the main focus of the plan.

- Corridor management plans would be essential in the region. In Tamil Nadu, two committees, one for the areas occurring north of the Palakkad gap and the other occurring in the south of the Palakkad gap have been constituted to assess corridors. Preliminary report has already been prepared by the committees. A total of 42 elephant corridors have been identified and many of them extend into neighboring states as well.
- The corridor report prepared by the committee deliberates on three forms of corridor units namely (i) critical corridor lands to be acquired/consolidated (ii) trek paths that are often used by elephants overtime (iii) safe zones around the corridors with a width of 1-2 km, which will be similar to the ESZ. In some of these corridors, engineering solutions may be needed.
- It may be recalled that the first elephant task force (1989-92), which recommended creation of the Project Elephant proposed a landscape approach to elephant conservation. This approach should be ingrained into the Regional Action Plan as well.
- The Regional Action Plan should call for (i) regular interstate meetings (ii) sharing HEC data among the states (iii) standardizing compensation (iv) best practices to be shared (v) corridor action plan

Dr. Naganathan concluded that the PE funding for the states has reduced drastically, which needs to be seriously looked into. The PE funding has to be enhanced to ensure sustenance.

**2. Views on the Regional Action Plan by Karnataka Forest Department:**
***Shri. Subhash K. Malkade, PCCF & CWLW, Government of Karnataka.***

Shri. Malkade opined that regional coordination among the states is critically required in the southern region where a large fraction of elephant habitats are shared across the state boundaries. He emphasized that elephants being a landscape species with high mobility, effective landscape planning is critical for effective management of elephant landscapes. He emphasized that for active landscape management, the Government of India through the Project Elephant has to generate considerable funds. The Regional Action Plan should ideally be steered by the Project Elephant by very actively coordinating with the States. The States can provide all sort of data and logistics support to the Project Elephant for coming up with a plan and ensuring its implementation in the field.

Shri. Malkade further mentioned that despite harboring the largest elephant population in India, Karnataka gets only INR 4 crores from the Project Elephant every year, whereas there is an annual requirement of about INR 100 crores and the southern region as a whole might require over INR 250 crores. Furthermore, he mentioned that the Government of India should ease the procedures related to radio collaring of elephants by suitably modifying

Section-12 under the Wildlife (Protection) Act, 1972.

**3. Views on the Regional Action Plan by Kerala Forest Department:** ***Shri. Pramod G. Krishnan, CWLW, Government of Kerala.***

Shri. Krishnan mentioned that Kerala fully supports the idea of having a Regional Action Plan in the southern region so that the states can actively work together. He mentioned that the main challenge would be to engage with other land-uses that are outside the jurisdiction of the Forest Department where elephants have an influence either in the form of HEC or movement through corridors. He cautioned that there is increased emphasis on ascertaining carrying capacity of elephants, which can be counterproductive as the concept is theoretical and may not be simplistically extended to real-life situations. Shri. Krishnan seconded that a regional hub of MoEFCC through WII in the southern region would be critical so that regular interstate meetings can be coordinated.

## TECHNICAL PRESENTATION

**Framework of the proposed Regional Action Plan by *Shri. P.C. Tyagi, Former PCCF (Apex), Tamil Nadu and Dr. Sanjay K. Srivastava, Former PCCF (Apex), Tamil Nadu***

- Given that elephants have large ranges spanning states, state-specific action plans for managing HEC are often inadequate.
- There is a need for active coordination and synchrony of activities by the range states sharing boundaries.
- Issues like disease spread, invasion by weeds etc would require very active interstate coordination to contain the spread.
- The Government of India has recently come up with a comprehensive document "Framework for Elephant Conservation Plan (ECP)" for the Elephant Reserves. Once ECP is prepared for all 33 ERs in India, bulk of the ambiguity in approaches towards effective management would considerably reduce. The ECP calls for landscape approach to elephant management and also necessitates active interstate coordination.
- The elephant population in the southern region can be envisioned as clusters with focal Elephant Reserves. Only the Rayala ER in Andhra Pradesh and Dandeli ER in Karnataka are somewhat isolated. Otherwise, the ERs are all shared and clustered in general.
- The proposed action plan should touch upon (i) ecosystem connectivity (ii) holistic conservation regardless of state boundaries (iii) efficient resource allocation (iv) climate resilience in the face of global change among others. The overarching goal of the regional action plan would be ensure long-term survival of the species while at the same time striving for minimising the current levels of HEC.
- It was recalled that the concept of Niligiri Biosphere Reserve management under Man and Biosphere program did not take off as there

were only state-specific plans. The main learning pertaining to administrative framework that could implement the regional action plan should be carefully thought out so that the plan does not remain a mere document.

- The proposed regional action plan should deal with (i) introduction to the region (ii) context of situation (iii) drivers and pressures on the habitat and populations (iv) HEC mitigation strategies and (v) enhancing institutional capacity to deal with HEC.
- To go ahead with the plan, it is critical to identify a core team for drafting the framework and constituents of the plan in the first phase. During the second phase, it is essential to field validate the plan. It is also essential to have a signed MoU between the states involved for effective implementation.

**Understanding Human Elephant Conflict: Issues, Challenges and Way forward - Dr. Bilal Habib, Scientist – F, Wildlife Institute of India**

- Human-elephant conflict is a very complex issue and holistic understanding is often a key to address it. There are numerous drivers of conflict and there are also site-specific underlying factors. Thus, using existing data and capitalizing on advancement in quantitative approaches can provide important insights that are useful for local management.
- Project Elephant and WII elephant cell has collated data from three major conflict-prone states of Chhattisgarh, Assam and Jharkhand in the country and using mechanistic analytical approaches unraveled critical aspects of conflicts.
- Overall, the current Situation (2019-2023) with respect to HEC is that the problem has been escalating in the country with over 2,850 human fatalities and 582 elephant deaths due to causes such as electrocution, train accidents, and poaching. Top affected states include Odisha, Jharkhand, West Bengal, Chhattisgarh, and Assam.
- In these major conflict affected states, the key factors driving human-elephant conflict (HEC) have been habitat degradation, fragmentation, and in some cases, locally overabundant elephant populations.
- Behavioral patterns such as opportunistic and habitual crop-raiding, exacerbated by the loss of older elephants who provide ecological knowledge, further escalate conflicts in certain areas. Behavioral underlying factors such as male-biased crop raiding attributed to phenomenon like musth can cause localized conflicts, which are difficult to address as males have been shown to take high risks venturing into human-use areas even in relatively intact habitats.
- The analysis of 23 years of HEC data collated from the three states indicated that electrocution was the leading cause of elephant deaths in Chhattisgarh, Jharkhand, and Assam. Such deaths primarily affected the male segment of the population, and particularly the young adult bulls and sub-adult bulls in the dispersal phase. Retaliation killings and

poaching also contributed to mortality.

- Significant disparities in human mortality in the state Jharkhand and Assam having some of the highest rates of human deaths caused by elephants. Seasonal and gender-related trends were observed, with more men being killed by elephants. The monsoon season was associated with increased conflict, as elephants move closer to human settlements for resources.
- Dr. Habib elucidated that there could be both proximate and ultimate solutions to escalating conflicts. Proximate approaches include deterrents like light, sound, and fencing, while ultimate strategies focus on improving the ecological understanding of elephant behavior and promoting sustainable land-use planning.
- Data-driven initiatives, such as village-level databases to track conflict zones, and a multidisciplinary approach involving communities, policymakers, and conservationists, are crucial for mitigating the conflict and ensuring both human and elephant welfare.

## STATE-SPECIFIC SUMMARY OF HUMAN-ELEPHANT CONFLICTS

### 1. Salient features of the elephant populations and HEC in Tamil Nadu by Shri. Srinivas R. Reddy, CWLW, Tamil Nadu.

- As per the latest elephant population estimation, Tamil Nadu has 2961 elephants.
- There are 5 notified Elephant Reserves in Tamil Nadu.
- Hosur, Coimbatore and Gudalur are major hotspots where HEC management has become exceedingly challenging.
- The state has invested nearly 2238 km of EPT over the years. The success rate of EPT remains mediocre.
- Consequently, the state has been experimenting with different novel barriers. Solar fences with ingenious modification and various extensions were tried. They fail generally due to inadequate maintenance. The steel-rope fence experimented in Hosur was by far the most effective barrier. It was cost effective compared to Railway barricades that Karnataka FD uses.
- In Tamil Nadu, all fences falling within 5 km need to be registered under the TN Power Fences regulation act. All the power distribution lines in vulnerable areas are being actively monitored. These measures are primarily intended to minimise electrocution threats.
- The early-warning system involving local communities, which proved to be highly successful in the Valparai region of Anamalai Tiger Reserve is now being experimented in Hosur.
- The rapid response teams have been quite effective lately, but there are major headcount shortages due to paucity of sustained funding support.
- Ex gratia payment process, through the treasury has been simplified. A total of INR 17.3 crores was paid to victims.
- Tamil Nadu has some of the best *kumki* elephants and mahouts in the

whole country and thus, capture, translocation and other such operations are not a concern. To further enhance the skills of mahouts, a few of the senior mahouts were even sent to Thailand.

- There are 119 captive elephants in the state. Of them, 65 are with the Forest Department in various camps, there are two elephants in the zoo, 20 elephants are with private owners and 32 elephants are with temple trusts.
- There are presently 44 dedicated vehicles for restoration and rehabilitation of animals.
- In Pethikuttai area of Coimbatore, the state has planned to have a dedicated elephant camp.
- Tamil Nadu has been the first to come up with a proper audit system for investigating elephant deaths. This has increased the overall transparency in the field.

**2. Salient features of the elephant populations and HEC in Karnataka by Shri. Manoj Ranjan, APCCF (Project Elephant), Karnataka (on behalf of the CWLW, Karnataka).**

- As per the latest synchronized elephant census, there are 6395 elephants in Karnataka. The state supports the largest elephant population in the whole country.
- Given the high population of elephants, human-elephant conflicts are also relatively high in Karnataka.
- Electrocution has emerged as a major challenge in Karnataka too and the problem appears to be difficult to tackle.
- So far, there have been no road and railway related elephant mortalities. However, the railway and road network are fast expanding. Such expansions should be carefully mitigated wherever appropriate.
- About 30-40% of the Protected Areas have been invaded by exotic weed plants that diminish habitat quality for elephants.
- The state has developed an online portal "e-parihara" which has eliminated the redundancy and simplified the process of filing ex gratia applications. Further, tracking applications has become simple.
- The state has already invested on 4000 km of railway barricades, which are relatively highly effective.
- Tentacle fences, which are modified solar fences, are also proving to be effective in some areas provided maintenance is adequate. The tentacle fences are relatively cheaper at INR 6.0 lakhs per kilometer.
- The state currently has 1000 personnel in the dedicated RRT units.
- Karnataka has some of the best kumkis, veterinary professionals and best elephant capture units. SoP is available for the entire capture process in Karnataka.
- Many elephants have been radio collared and the data gathered through telemetry has provided invaluable insights in aligning management interventions.
- The state has even developed indigenous collars, which will just cost

INR. 2.0 lakhs whereas imported collars cost INR 8.0 lakhs and above.

- Technology and AI holds a huge potential in conflict resolution, if effectively planned. AI cameras are proving to be effective in tracking animal movement. Drones, including that of the thermal variants are useful in tracking animal movement in human-use areas. The state has created state-of-the-art control rooms to track animal movement using AI technology.
- Community outreach programs such as "Ane Helli?" are becoming popular as information on elephants can be broadcast widely. Similarly, "Ane Mitras" have been created to tap village-level volunteer support for HEC management. Through "Aranya Samarasa Program" activities such as habitat management including desilting are now being carried out involving local people.

**3. Salient features of the elephant populations and HEC in Kerala by Shri. Pramod G. Krishnan, CWLW, Kerala.**

- In Kerala, there are 4 Elephant Reserves
- In the state, the elephant population has been relatively stable although in few isolated areas marginal increase is reported
- In Kerala, HEC is more social and political and less ecological. Therefore, HEC resolution should mirror political ecology of the region.
- Kerala has declared human-wildlife conflicts as state-specific disaster. This has some advantages such as easy mobilization of essential resources. There is a State Disaster Management Authority (SDMA).
- There are 12 major conflict areas, which include Nilambur, Mannarkkad, Vazhachal, Ranni, Konni, Trivandrum, Aralam, Munnar, Wayanad, Palakkad, Thrissur. About 284 panchayats and 54 assembly constituencies have wildlife conflicts in Kerala.
- HEC management requires two-pronged approaches namely "front-end" involving barriers and others and "back-end" involving habitat restoration, public relationship etc.
- Kerala situation makes it amply clear that every HEC situation is unique and thus broad generalizations are seldom useful.
- Active inter-departmental cooperation is critical. In Kerala, there is coordination between Forest Department and line agencies such as SDMA, revenue, Police, Fire and other departments.
- Corridor management is essential. Macro corridors are known. However, micro corridors (or bottlenecks) within corridors need to be identified to better manage corridors.
- Invasive species such as *Senna spectabilis* and *Lantana camara* are proving to be invincible for the management to tackle.
- RRT is effective in Kerala and much needed. Equally important is to have primary response team comprising village volunteers.
- Scientific studies on elephants and their habitats have reduced over time and this is a major cause of worry. Science and management should go hand-in-hand.

- Media is an important stakeholder. Effective media management assumes critical importance to prevent unnecessary political escalation of HEC.
- There is severe fund crunch in the state and central assistance for elephant management is quite less. INR 30 crores is earmarked for managing human-wildlife conflicts whereas over INR 200 crores is needed for effective management.
- Rewarding exceptional field performers is essential to keep the morale of the field staff high. Kerala has amply recognised this.

**4. Salient features of the elephant populations and HEC in Andhra Pradesh by Shri. Chaitanya Reddy, DFO, Chittoor (on behalf of the CWLW, Andhra Pradesh).**

- Andhra Pradesh has two populations of elephants. One in the northern districts, primarily concentrated in Parvathipuram Manyam where there are 11 elephants and the southern districts of Chittoor and Tirupathi where there are about 140 elephants.
- Elephant population in southern Andhra Pradesh rose from 40-50 during 2013 to about 140 in the present.
- Habitat fragmentation from ever increasing infrastructure development poses the most significant challenge in maintaining habitat integrity in the southern districts. In some of the existing and planned infrastructure developments, elephant-specific mitigation measures have been taken up. 3.4km underpass is proposed in the Bangalore-Chennai expressway passing through Palamner in the vicinity of Rayala ER.
- In southern Andhra Pradesh, Government of India has identified 2 elephant corridors as per the all-India corridor report of 2023.
- There are over 85 elephant trackers in Chittoor district alone. Their role has been central in effectively managing HEC in the landscape.
- The state has planned to get 8 captive elephants to be used as kumkis.
- Andhra Pradesh requires the support of both Tamil Nadu and Karnataka to effectively manage elephants, habitats and conflicts as both the states have high level of expertize.

**5. Dr. Dheeraj Mittal, AIGF(PT&E), MoEF&CC** briefed about the goals, objectives and implementation strategy of the regional action plan as per the concept note prepared and shared by Project Elephant Division. A copy of the concept note is placed as **Annexure.**

## MAJOR DELIBERATIONS

Consequent to state-specific perspectives on the proposed Regional Action Plan, the **DGF&SS Shri. Jitendra Kumar** solicited comments and moderated the discussions pertaining to essential constituents of the plan. Some of the major comments raised by the members are as follows:

1. ***Shri. A. Udhayan, PCCF& Director, Advanced Wildlife Institute, Tamil Nadu Forest Department*** mentioned that areas that have emerged as hotspots are being taken up as priority for all the discussions on HEC management. While this is intuitive and required, we should not ignore elephant landscapes where conflict is presently minimal. He emphasised that by monitoring areas with minimal conflict, early signs of escalation can be promptly identified and acted upon rather than waiting for the situation to go out of control. He mentioned that dedicated man-power is needed to address HEC as the system is currently stressed and individuals are overburdened with work.
2. ***Shri. Manoj Kumar, APCCF (Project Elephant), Karnataka*** mentioned that invasive management assumes a priority and the proposed Regional Action Plan should elaborately deal with the issue of biological invasion by weeds in the landscape and approaches to minimise the problem. Shri. Manoj mentioned that the Karnataka Forest Department conducted an international conference on elephant management recently in Bengaluru, where several world-renowned experts participated and provided valuable insights on a variety of key topics in elephant conservation and management. A total of 12 research publications emerged from the conference and the conference also resulted in "Bengaluru charter" where Hon'ble Forest Ministers of 6 states participated and deliberated on key issues.
3. ***Shri. Sanjay Shukla, Member Secretary, Central Zoo Authority*** emphasized on the importance of effective captive elephant management. He said that there is no proper mechanism in place to carryout a welfare assessment of captive elephants in the present. Shri. Shukla also mentioned that the organized crimes affecting elephants such as ivory poaching has reduced, but issues like electrocution needs to be thoroughly investigated.
4. ***Shri. Jayaraj, DFO, Coimbatore*** mentioned that Coimbatore Forest Division is surrounded by Protected Areas and with an interface zone of nearly 300 km, the division is badly affected by HEC. He mentioned that 30-40% vacancy exists at the frontline staff level, seriously hindering the field activities. He suggested that Forest Department can think of creating armed reserve personnel in forest management similar to that of armed reserve personnel of the police force.
5. ***Dr. Pramod, Senior Scientist, SACON (WII's southern regional centre)*** mentioned that the concept of wildlife corridors is highly dynamic in nature. Thus, long-term monitoring of elephant corridors assumes greater importance.
6. **Shri. A. Udhayan, Director, Advanced Wildlife Institute, TN** mentioned that in certain cases where HEC is acute and elephant habitats are saturated, hard-nosed decisions such as immuno-contraception to stabilize elephant populations might be required. He further mentioned that the Advanced Wildlife Institute of the Tamil Nadu Forest Department has envisioned experimental approach towards the

same. The immune-contraception as a means of regulating/stabilizing wildlife populations is already being used on a variety of species in range of circumstances and that for elephants, technically proven methods are already in place.

7. **Shri. Subhash Malkade, CWLW, Karnataka** mentioned that the issue of immuno-contraception was discussed with the South African experts during the international elephant conference that Karnataka steered during August 2024. Based on the discussions, he said, there appear logistical concerns and thus, we should be selectively using the approach on an experimental basis.
8. **Dr. A.B. Srivastava, Former Director, Jabalpur Veterinary College** mentioned that efficacy of immuno-contraception is highly species specific and context specific and that generalizations cannot be made in the present where the approach is still nascent.
9. **Dr. Parag Nigam, Nodal Officer, Elephant Cell** mentioned that there are major logistical concerns facing administering immuno-contraceptives for wild elephant populations.
10. **Dr. Bilal Habib, Associate Nodal Officer, Elephant Cell** mentioned that the country is already late in experimenting with the immuno-contraceptives. He further mentioned that identifying individual elephants for achieving reduction is not required and logistical concerns around identification of the same individuals for administering contraceptives is baseless.
11. **Dr. Sanjay K. Srivastava, Former PCCF (Apex),** Tamil Nadu mentioned that during 1980s and years preceding, ivory poaching was a high worry and that large number of elephants used to get removed from the population. With poaching suppression, there seems to have drastic recovery of elephant population in certain areas.
12. **Shri. P.C. Tyagi, Former PCCF (Apex), Tamil Nadu** mentioned that the regulatory concerns on use of immuno-contraceptives exist; otherwise methods are available to use the method in the field.
13. **Dr. Ramesh Kumar, CF, Project Tiger, Karnataka** mentioned that elephant population even in high density reserves like Bandipur and Nagarahole has been quite stable over decades, while the habitat quality has declined. He said, it is habitat that need more focus rather than focusing on reducing the populations.

## ACTION POINTS

1. The Core Team cum Drafting Committee for the Regional Action Plan to be constituted by the Project Elephant. The Drafting Committee would comprise officials from Project Elephant, State Forest Departments, WII and experts/consultant. From the State Forest Departments, officers in the rank of APCCF (Wildlife) or APCCF (Project Elephant) may be nominated by the States. Project Elephant will seek nomination of officials from the concerned states.

2. The core team may deliberate on the action plan and come up with a comprehensive template that may be shared with the states.
3. MoEFCC would look into funding possibilities from National CAMPA and other sources that may be mobilized for the Regional Action Plan.

**List of Attendees**

| S.No | Name | Designation |
|---|---|---|
| 1 | Shri. Jitendra Kumar, IFS | DGF & SS, MoEF&CC |
| 2 | Dr. Sudhanshu Gupta, IFS | PCCF & HoFF, Tamil Nadu |
| 3 | Shri. Subhash K. Melkhede, IFS | PCCF & CWLW, Karnataka |
| 4 | Shri. Srinivas R. Reddy, IFS | PCCF & CWLW, Government of Tamil Nadu |
| 5 | Shri. Sanjay Shukla, IFS | Member Secretary, CZA, MoEFCC |
| 6 | Dr. Gobind S. Bhardwaj, IFS | Member Secretary, NTCA and ADG (PT&E), MoEFCC, |
| 7 | Shri. A. Udhayan, IFS | PCCF & Director, AIWC, Tamil Nadu |
| 8 | Shri. Pramod G. Krishnana, IFS | PCCF & CWLW, Kerala |
| 9 | Dr. V. Naganathan, IFS | APCCF (Wildlife), Tamil Nadu |
| 10 | Shri. Manoj Ranjan, IFS | APCCF (Project Elephant), Kerala |
| 11 | Dr. George Jenner, IFS | APCCF & DDG, IRO, MoEFCC, Chennai |
| 12 | Shri. S. Ramasubramanian, IFS | CF & FD, Anamalai TR |
| 13 | Dr. Dheeraj Mittal, IFS | AIG (PT&E), MoEFCC |
| 14 | Shri. V. Thirunavukkarasu, IFS | APCCF, CASFOS, Coimbatore |
| 15 | Shri. R. Ravishankar, IFS | CCF, Hassan, Karnataka |
| 16 | Shri. D. Venkatesh, IFS | CF & FD, Mudumalai TR |
| 17 | Dr. P. Ramesh Kumar, IFS | CF (Project Tiger), Karnataka |
| 18 | Ms. Harini, IFS | AIG (NTCA), Bangalore |
| 19 | Ms. G. Mangamma, IFS | DCF, Indira Gandhi Zoo, Vishakapatnam |
| 20 | Shri. K. Rajkumar, IFS | CF & FD, Sathyamangalam TR |
| 21 | Ms. C. Vidya, IFS | DD, Mudumalai TR |
| 22 | Shri. C. Selvam, IFS | Curator, Sri Venkateswara Zoological Park, Tirupathi |
| 23 | Dr. Santhosh Kumar, IFS | DCF, Kollegal |
| 24 | Shri. P. Vivek, IFS | DFO, Annamayya |
| 25 | Shri. C. Chaitanya Reddy, IFS | DFO, Chittoor |
| 26 | Shri. N. Jayaraj, IFS | DFO, Coimbatore |
| 27 | Shri. E. Prashant, IFS | DFO, Kanniyakumari |
| 28 | Shri. Kripa Shankar, IFS | AIWC, Chennai |

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|---|---|---|
| 29 | Dr. Parag Nigam | Scientist G & Nodal Officer, Elephant Cell, WII |
| 30 | Dr. Bilal Habib | Scientist F & ANO, Elephant Cell, WII |
| 31 | Shri. P.C.Tyagi, IFS (Retd) | Former PCCF (Apex), Tamil Nadu |
| 32 | Dr. Sanjay Srivastava, IFS (Retd) | Former PCCF (Apex), Tamil Nadu |
| 33 | Shri. K. Manoj | ACF, Thrissur, Kerala FD |
| 34 | Dr. N. Lakshminarayanan | Elephant Cell, WII |
| 35 | Shri. A.D. Udhayaraj | Elephant Cell, WII |

Annexure

CONCEPT NOTE ON 'REGIONAL ACTION PLAN FOR COMPREHENSIVE UNDERSTANDING & MANAGEMENT OF HUMAN ELEPHANT CONFLICT IN SOUTHERN INDIA'

The Indian Elephant (*Elephas maximus indicus*) occurs in 16 states of India in 33 Elephant Reserves (ER) spread out in the North Eastern, East Central, North Western and Southern Regions; having a population of 29964 (as per estimation in the year 2017) covering an area of 80777.778 $km^2$ of ERs. The elephants in southern India range over forested hilly tracts of the Western Ghats and its adjacent Eastern Ghats in the states of Karnataka, Kerala and Tamil Nadu, and more recently in a small area of Andhra Pradesh, Maharashtra and Goa. At present, elephants are found in five significant landscapes in southern India

- Uttara Kannada and crestline of ghats, mainly in the forests of Dandeli as the important elephant habitat, that includes a few elephants that move into Maharashtra and Goa.
- The Malnad plateau, in particular the Bhadra Wildlife Sanctuary, to the east of the ghats holds an isolated population.
- The Brahmagiri–Nilgiri–Wyanad–Mysore landscape with the Nagarahole, Bandipur, Wayanad and Mudumalai complex harbours the high density of elephant, followed by significant numbers in Biligiri rangans and hilly tract along Cauvery River. A small population that dispersed in 1980s now ranges as scattered groups over isolated hills to the east in AP & Tamil Nadu.
- Anamalai-Nelliyampathy landscape with Anamalai, Parambikulam, Malayattur and Vazahchal Forest Divisions supports significant population of elephants and includes isolated elephants in Idukki Sanctuary and Kothamangalam Forest Division.
- Periyar-Agasthyamalai landscape with Periyar, Ranni, and Srivilliputhur harbours good population of elephants including isolated population in the south of Shenkota pass in the Agasthyamalai hills.

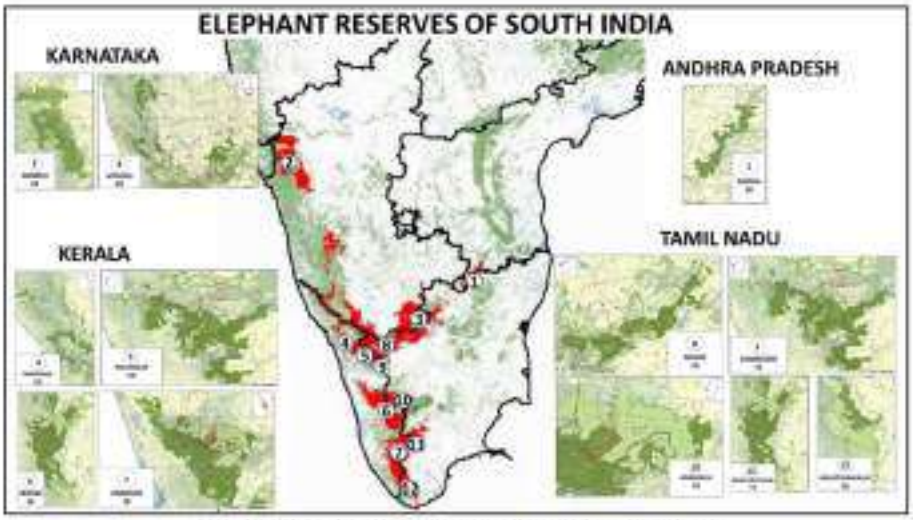


*Fig-1: Elephant Reserves of Southern India*

**Elephant population in the Southern States**

| S. No | State | 2007 | 2012 | 2017 |
|---|---|---|---|---|
| 1 | Andhra Pradesh | 28 | 41 | 65 |
| 2 | Karnataka | 4035 | 5648-6488 | 6049 |
| 3 | Kerala | 6068 | 5942-6422 | 5706 |
| 4 | Tamil Nadu | 3867 | 4015 | 2761* |

** As per elephant population estimation by Tamil Nadu in 2024 there are 3063 elephants.*

**Human elephant conflict** (HEC)- In South India, there are significant number of human deaths every year with intense crop damage due to conflict. The intensity of HEC is highly variable ranging from occasional to chronic. HEC mitigation so far has largely focused on the use of barriers, short distance drives, and ex-gratia or compensation for 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. The statistics of human-elephant conflict in the southern part of India over the last five years is given below.

**Elephant casualties due to train accidents**

| S.No. | State | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | Total |
|---|---|---|---|---|---|---|---|
| 1 | Tamil Nadu | 0 | 1 | 3 | 0 | 0 | 4 |
| 2 | Kerala | 3 | 0 | 0 | 2 | 0 | 5 |
| 3 | Karnataka | 0 | 1 | 1 | 0 | 0 | 2 |
| | **Total** | **3** | **2** | **4** | **2** | **0** | **11** |

**Elephant casualties due to electrocution**

| S.No. | State | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | Total |
|---|---|---|---|---|---|---|---|
| 1 | Andhra Pradesh | 5 | 1 | NR | 5 | 6 | 17 |
| 2 | Karnataka | 8 | 9 | 7 | 15 | 13 | 52 |
| 3 | Kerala | 4 | 2 | 6 | 7 | 10 | 29 |
| 4 | Tamil Nadu | 15 | 9 | 5 | 14 | 6 | 49 |
| | **Total** | **32** | **21** | **18** | **41** | **35** | **147** |

**Elephant casualties due to Poaching**

| S.No | State | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | Total |
|---|---|---|---|---|---|---|---|
| 1 | Andhra Pradesh | 0 | 0 | NR | 0 | 0 | 0 |
| 2 | Karnataka | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Kerala | 1 | 1 | 0 | 0 | 0 | 2 |
| 4 | Tamil Nadu | 0 | 2 | 3 | 1 | 4 | 10 |
| | **Total** | **1** | **3** | **3** | **1** | **4** | **12** |

**No elephant casualties have been reported due to poisoning** in the States mentioned above in the last 5 years.

**Human Casualties due to elephant attacks**

| S. No | State | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | Total |
|---|---|---|---|---|---|---|---|
| 1 | Andhra Pradesh | 4 | 6 | NR | 5 | 6 | 21 |
| 2 | Karnataka | 30 | 26 | 27 | 29 | 48 | 160 |
| 3 | Kerala | 12 | 20 | 25 | 22 | 23 | 102 |
| 4 | Tamil Nadu | 58 | 57 | 37 | 43 | 61 | 256 |
| | Total | 104 | 109 | 89 | 99 | 138 | 539 |

Owing to the rising numbers of human-elephant conflict incidents in the Southern states of India, the Tamil Nadu Forest Department submitted a concept note for the Regional Action Plan for Comprehensive Understanding and Management of Human-Elephant Conflict in Southern India. A copy of the concept note submitted by the State of Tamil Nadu is placed at **Annexure- I.** The concept note was discussed during the 17th meeting of the Steering Committee of the Project Elephant, held on 12th August 2022 at Kerala under the chairmanship of the Hon'ble Minister, EF&CC, wherein it was decided that instead of state-specific plans, considering elephants' large ranges, region-specific plans would be significant. The matter was also discussed during the 18th, 19th and 20th meetings of the Steering Committee of the Project Elephant, held under the chairmanship of the Hon'ble Minister, EF&CC. It was decided during the meeting that the Ministry, in collaboration with the Tamil Nadu Forest Department, would conduct a regional meeting involving Kerala, Karnataka and Andhra Pradesh to granulate the components of the Regional Action Plan.

During the 17th Steering Committee meeting of Project Elephant held on 12th August 2022 at Periyar Tiger Reserve, Kerala, it was also discussed conducting the series of regional conferences with Chief Wildlife Wardens and District collectors to foster interstate coordination in managing elephant populations and addressing human-elephant conflict. In compliance, Project Elephant, MoEF&CC and State Forest Department, Govt. of West Bengal organised a coordination meeting of the Elephant range States of the East Central Landscape on 19th January 2023 at Kolkata, West Bengal. The officials of the MoEF&CC and State Forest Departments of West Bengal, Bihar, Chhattisgarh, Jharkhand, Odisha and Madhya Pradesh attended the meeting. During the meeting, it was decided that a Memorandum of Understanding (MoU) may be signed among the Elephant Range States of the East Central Landscape for better and collective efforts in the conservation and protection of elephants and their habitats. The West Bengal Forest Department has taken the lead in preparing the MoU. A draft MoU has been submitted to the Ministry for signing between MoEF&CC and Govt. of Chhattisgarh, Jharkhand, Odisha and West Bengal. A copy of the draft MoU is placed in **Annexure-II**. The progress in this regard was also discussed during 20th Steering Committee meeting of Project Elephant.

## REGIONAL ACTION PLAN (RAP)

The Elephant Reserve landscape needs a separate management planning process for Tiger Reserves (TR), Protected Areas (PA), Forests Areas (FA) and Eco-sensitive Zones (ESZ) and human dominated landscapes including non-forest areas. Elephants do not recognize geo-political boundaries such as States and move across States in a landscape. **Accordingly, a Regional Action Plan (RAP) approach at the landscape level is proposed.**

### Goals

The primary goal is to ensure the conservation and sustainable management of elephant populations and their habitats. The **two overarching goals** are:

i. Ensure the long-term survival of viable (demographically and genetically) populations of elephants through land-use planning, regulation and consolidation in the larger natural landscapes of the States, ensuring free transboundary movement and habitat.
ii. Reduce the levels of HEC to relieve human suffering from loss of crops, property, and life, promote greater tolerance and acceptance of elephants in the landscape by local communities, protect their livelihoods, and ensure effective participation in conservation.

### Objectives

i. To assess and map the connectivity/corridors at multiple scales and long-distance pathways between the states and local movement areas within the connected landscape.
ii. To identify, track, and restore pinch points within the elephant corridors for long-term viability.
iii. To identify and map human-elephant conflict hotspots. Evaluate the success of the measures used to minimise the human elephant interaction for further implementation.
iv. To investigate and evaluate elephant behaviour, cognition and ecology at the individual level to prevent conflict from occurring in the first place. (This is important as the current efforts to mitigate human-elephant conflict considering immediate human-centric concerns and deterrents against wildlife rather than providing solutions to the underlying problem).
v. To understand the resource availability across seasons towards estimating carrying capacity of the Elephant in the habitat clusters of southern Indian landscapes. The ecological carrying capacity needs to be validated vis a vis social carrying capacity.
vi. To understand the movement pattern of elephants in the landscape before any conflict. To capture and have intensive monitoring of the potential conflict individuals based on telemetry technology.
vii. To undertake community-oriented sensitization, incentives and implementation of conflict response strategies by the local people. To conduct awareness programmes & campaigns and promote strategies to reduce conflicts including crop protection and community-based initiatives.

viii. To engage with multiple stakeholders to procure, incentivize, or lease the habitat areas that can serve as corridor and refuge with habitat improvement to encourage reverse pull factors.

ix. To protect and maintain ecological corridors and restore/rehabilitate disrupted or degraded corridors to enhance connectivity within and beyond the reserves including traditional migration routes

x. To develop overall capacity and finance instruments such as infrastructure, rapid response and long-term management units for management of conflicts in the region which includes deployment of early-warning systems and conflict management teams.

xi. Establishing Institutional Framework/Regional Coordination Committees/Sub-Regional Coordination Committees/ Local-Co-ordination Committees for regional co-operation and to mobilise shared resources with defined scope of works.

xii. To implement the concept of Phase IV Monitoring – Monitoring the identified locations with elephants for demography over time. This will involve selection 20 -25 sites across the southern states for annual monitoring of the elephants. The monitoring will be just for five days at the identified locations at the same time across the years.

**Implementation Strategy**

A significant gap involves effective problem analysis to identify drivers and pressures of conflict, which would allow appropriate selection of management interventions at the regional level. An assessment of long-term outcomes and implications of all management interventions is needed to identify effective and most appropriate measures. Cross-sectoral cooperation in an institutional framework is critical for addressing drivers of conflict.

1. Proposed management interventions and activities may target four key dimensions:

- ***Biological dimensions*** covering activities dealing with set of interventions based on the behavioural ecology of elephant population.
- ***Habitat dimensions*** covering activities dealing with forest habitats and their capacity to nurture elephant population.
- ***Human dimensions*** covering activities dealing with the perspectives over human-elephant interaction and capacity of communities to cope up directly and indirectly coming into the negative interactions.
- ***Management dimension*** covering activities dealing with the enhancement of organizational capacity and development of organizational/institutional frame work and tools to plan, execute and monitor efficient mitigation measures.

2. Key considerations in the implementation strategy envisages:

- ***Phased Implementation***: Establishing an institutional framework and prioritizing high-conflict areas for immediate intervention while gradually expanding to other regions.
- ***Stakeholder Involvement***: Engaging all relevant stakeholders, including local communities, government agencies, conservation organizations and researchers in the planning and implementation process.

- ***Institutional arrangement***: Establishing institutional framework, finalization of MoU for better co-ordination & co-operation among partner states.
- ***Long-Term approach***: Ensuring that the action plan is sustainable, with a focus on long-term coexistence between humans and elephants in South India.

**Developing RAP Framework: For** developing framework of the RAP, the following considerations are important:

- ***Data Considerations***: include elephant population data; demography, habitat data; movement & migration patterns; threat assessment; climate & environmental data; socio-economic data; land use plans; corridor & connectivity data; health and disease data; research findings; conflict data etc. The existing rules, guidelines and regulatory framework need to examined.
- **Planning process**: involving discussion with the experts/ CWLWs of respective states and the validation of the developed framework.

**Way Forward**

- A core team may be formed consisting of mix of scientists, wildlife managers, wildlife policy experts and capacity development experts to draft the regional action plan. A common understanding may be developed on the overall purpose, scope, approach and methodology.
- The core team may take up review the existing data / documents / guidelines available from the MoEF&CC and different states in South India, and relevant information and accordingly recommendations may be brought into this new document.
- The plan may be made for 10 years with proposed budget outlays for identified activities. These activities may further be detailed in an Annual Plan of Operations (APO). The funding through the National Authority CAMPA may be explored once all the States agree the draft Regional Action Plan.
- MoU may be finalized and signed between the States for fostering the inter-state - cooperation.

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Annexure -I

## Concept Note for

# Regional Action Plan for Comprehensive Understanding and Management of Human Elephant Conflict in Southern India.

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**Background**: Human-wildlife conflict is the single most management problem that has been persistent for wildlife managers, requiring credible solutions, in order to prevent human deaths, animal's deaths, and loss of properties. The conflict issue is directly linked to livelihood of the people, economic prosperity and survival of the species in the long-term. The conflict animals include both life threatening and causing serious impacts on agriculture/horticulture crops and thus, invoking negative response from people. Therefore, wildlife conservation is directly linked to the way the human-wildlife conflicts are managed. Although the conflict situations and problems vary across the areas and season, the animals that are linked to human deaths and severe loss of property and crops such as Elephant require immediate attention if we are to address this vexing and most critical management problems. It is not that human-wildlife conflict issues have not been taken up in the past but in fact, this has been amongst the priority theme or actions that have been the focus of wildlife managers and conservationists. However, the issues have largely been understood based on the conflict occurrence and once the damage have already been done, and rarely, the conflict incidents have been predicted to prepare for future actions. Any information that is not futuristic is unlikely to help prepare the managers and the people to expect and prepare for conflict management resolution strategies. Such prediction would be possible when we have comprehensive understanding of the causative factors that are responsible for the conflicts and the multiple mechanisms that offer dynamic solutions. Once the biological and sociological factors have been understood and relevant linkages have been established, evolving comprehensive conflict management strategies would be possible.

**Key Drivers**: Human Elephant Conflict (HEC) is partly influenced by the large home range of the species and landscape characteristics, which has been severely modified. Therefore, the conventional migratory pathways have been affected and the population dynamics within and across the border also facilitate the spatial and temporal dynamics of the conflicts. In the absence of complete knowledge on the corridors under regular use, cross-border issues and related information, it would be difficult to address the HEC. More importantly, the resultant response by people would drive the elephant population to decline clandestinely as there is no system in place to keep watch of individual elephants, family, herds, clan etc.,

The components that drive the HEC in the southern Indian populations are

(1) Spatial pattern of landscape configuration and the need to rationalize the elephant and animal spaces.

(2) recent spurt in the land use in favour of fruit yielding trees and other crops that function as pull factor

(3) elephant populations being in a metapopulation with sub-populations located in different states with border areas beings the most important facilitator of the sub-population movements,

(4) inadequacy in the community engagement and knowledge sharing.

(5) absence of a road map with specific action points to deal with issues in the landscape context, taking into account the cross border issues.

**Response Mechanism**: HEC management and long-term survival of the elephant in the southern regions relies on the way the border areas are understood and managed. Site specific management actions are not adequate for the elephants because most of the elephant movements and deaths are driven by actions along the borders. Therefore, any efforts in one locality are unlikely to address the issues holistically as the source of the problem has not been addressed fully. Therefore, a comprehensive understanding of the spatial patterns of elephants in terms of population distribution, movement pattern, landscape change and future trajectories and people perception is required to develop a credible response action. Accordingly, it needs to be developed into a clear road map with specific milestones in the form of a DPR with budget outlay including the mechanism for long-term sustainability of response actions.

**Aims and Objectives**: In the context of understanding site-specific problems and to draw scientific basis for management of conflicts in the specific sites, a concept for comprehensive regional action for elephant management has been conceived with the following objectives.

(1) Tracking of traditional elephant corridors and prepare status map for those corridors.
(2) Tracking of HEC areas and prepare a status map of the present threats and possible remedies.
(3) Understand the resource availability across seasons towards **estimating carrying capacity of the Elephant** in the habitat clusters of southern Indian landscapes.
(4) **Map the connectivity / corridors at multiple scales** such as long-distance pathways between the states and local movement areas within the connected landscape.
(5) Capture and intensive **monitoring of the potential conflict individuals** based on telemetry technology.
(6) Undertake community-oriented sensitization, incentives and implementation of **conflict response strategies by the local people**.
(7) Engage multiple stakeholder to **procure or incentivize or lease the habitat areas that can serve as corridor and refuge** with habitat improvement so that reverse pull factors can be encouraged.
(8) Develop **capacity and finance instruments** such as infrastructure, training and rapid response and long-term management units for management of conflicts in the region including deployment of early-warning systems.

**Implementation**: The Regional Action Plan would be executed collaboratively by various partner Institutions, with the State Government of Tamil Nadu taking lead role.

The objective 1. Would address identifying and tracking the traditional elephant corridors maintaining connectivity between the entire Southern Indian Elephant population with the help of secondary information and field evidences.

The objective 2. Would address tracking of HEC areas and understand the evolved challenges and threats in the corridors and elephant movement areas to prepare a road map to address the challenges and to suitably identify remedial measures.

The objective 3. would involve detailed assessment of habitat quality and quantity for estimating biomass and carrying capacity of the area for the target species. The investigation would be carried out across multiple spatial and temporal scales keeping in view the behaviour of the animals and seasonality of the resources.

The objective 4 would primarily focus on the animals that are potential conflicting animals living at the edge of the forest and are in close interface with human. Sample of individuals from each population would have to be captured, radio/GPS collared and monitored, while the problem animals would be translocated elsewhere. This would involve intensive veterinary inputs and intensive monitoring based on Satellite/GSM/UHF units, while the ground team would be working round the clock to meet the objective of 24/7 monitoring.

The objective 5 would involve assessing socio-economic status of the local people and the nature of interface issues with the forest, which make the human-wildlife conflict as recurring event. It would also involve understanding the level of conflict and preparation by the people to deal with human-wildlife conflict. Participatory appraisal activities would be carried out to involve people participation to deal with human-wildlife conflict collaboratively and effectively. Structural and functional interventions such as physical barriers and early warning systems would be made to protect loss of crops and to prevent human life.

The objective 6 would focus on capacity building training for forest staff and local people to deal with the conflict situations and would develop necessary finance support system and infrastructure including animal holding facility, sophisticated animal capture and transportation vehicles, state-of-art laboratory for biochemical and disease analysis and setting-up of Centre for Elephant Management in the State for crisis management.

The objective 7. would identify the multiple stakeholders in addressing HEC, negotiating restoration of corridor and refuge areas through procurement, incentivisation or lease and prepare a road map to address the need.

The objective 8. would address the capacity and training of Forest Department Staff and other stakeholders, supplemented with awareness creation and encouraging local support mechanism to arrive at people participatory HEC redressal plan.

**Action Plan Team**: All these above actions would have to be incorporated in a Regional Action Plan through consultative process, involving experts, stakeholders, communities and policy makers. This can be done through formal and informal meetings /workshops, and secondary data analysis. A team of experts needs to be constituted and this team would draft the plan and get it endorsed by the State Government and Project Elephant Division of Government of India to be executed with required administrative and financial support. The Wildlife Institute of India will be engaged for scientific consultation.

**Schedule of Activities**: As the threat to elephant population is serious and needs very immediate action to avoid loss of any more individual elephant due to un-natural reasons. A Regional Action Plan has to be made ready within next six months. The Regional Action Plan

would serve as a guiding document towards ensuring Zero Un-natural Death of elephants not only within the geographical limits of one state as elephant is a long ranging and interstate ranging animal it should address the whole southern region. It requires a dedicated Elephant Management Cell (EMC) based in Coimbatore with three Senior Scientists with Ph.D to work for each State supported by two SRFs for each Senior Scientist to assist in field work and reporting with basic office facilities. Accordingly, the following schedule of activities along with structural intervention have been proposed.

Year 1: Approval of the concept by the Project Elephant of Government of India, Establishment of Elephant Management Cell Constitution of Regional Action Plan Committee (RAPC) with the State of Tamil Nadu heading the committee. Consultation Workshop and preparation of DPR. Review the status of population, mortality and corridor at local level, and map the connectivity/ corridor of the elephants.

Year 2: Collar representative individuals of elephants and study their actual moment pattern. Undertake spatial analyses to update the corridor maps. Implementation of the individual specific and site-specific actions, including physical, biological, social and technological measures, with focus on immediate, short-term and long-term options.

Year 3: Monitoring, reviewing, best practices identifications, standardisation and scaling up.

**Budget Requirement**: Implementation of Regional Action Plan would involve the following activities and budget provisions. The budget proposed is for three years.

| | | |
|---|---|---|
| 1. | Establishment of Elephant Management Cell (EMC) | 80 Lakhs |
| 2. | Preparatory Activities and DPR. | 40 lakhs |
| 3. | Consultation Meetings and Coordination | 60 lakhs |
| 4. | Research and Mapping | 100 Lakhs |
| 5. | Community Engagement and Incentives | 100 Lakhs |
| 6. | Capacity Building and Staff Support | 100 Lakhs |
| 7. | Report and Feed back | 20 lakhs |
| 8. | Consultation of Wildlife Institute of India. | 100Lakhs |
| | **Total** | **600 lakhs** |
| | **(Six hundred lakhs only)** | |
| | (Six Crores (6) for 3 years) | |

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Annexure -II

Government of West Bengal
Directorate of Forests
**Office of the Principal Chief Conservator of Forests,**
**Head of Forest Force, West Bengal**
Aranya Bhawan, Block : LA- 10A, Sector- III, Saltlake City, Kolkata-700106
Telephone No. (033)2335-8581 / 7751, Fax No. (033)2335-8756
Website - www.westbengalforest.gov.in , e-mail: pccfhoff.office-wb@gov.in

No. 3522 / CS / 2M- 1552 / 2021 Dated 13. 07. 2023

To : The Director,
Project Elephant,
Ministry of Environment, Forests & Climate Change.
Government of India,
6th Floor, Jal Wing, Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj, New Delhi – 110 003
[Kind attention : Dr. K. Muthamizh Selvan, Scientist 'E']

Sub : Memorandum of Understanding between the MOEF&CC, Govt. of India and Governments of Chhattisgarh, Jharkhand, Odisha and West Bengal

Ref : This office letter no. 1340 / CS / 2M- 1552 / 2021 dated 18. 05. 2023

Sir,

In view of the outcome of the Inter-state Co-ordination Meetings held in Kolkata on 19th January, 2023 and the discussions held with you, copy of draft Memorandum of Understanding between Ministry of Environment, Forests & Climate Change (Project Elephant Division), Government of India and Governments of Chhattisgarh, Jharkhand, Odisha and West Bengal to work together on the issue of Human-Elephant Conflict is sent for your kind perusal and further action into the matter.

The suggestions received from PCCF, Wildlife & CWLW, Jharkhand on this issue vide his letter no. 713 dated 08. 06. 2023 is enclosed for your kind information.

Enclo : As above

(Soumitra Dasgupta)
Principal Chief Conservator of Forests
& Head of Forest Force, West Bengal

No. 3523 / CS / 2M- 1552 / 2021 Dated 13 . 07. 2023

Copy forwarded for information to :-

1. The Principal Chief Conservator of Forests, Wildlife & CWLW, Chhattisgarh
2. The Principal Chief Conservator of Forests, Wildlife & CWLW, Jharkhand
3. The Principal Chief Conservator of Forests, Wildlife & CWLW, Odisha
4. The Principal Chief Conservator of Forests, Wildlife & CWLW, West Bengal

Principal Chief Conservator of Forests
& Head of Forest Force, West Bengal

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**MEMORANDUM OF UNDERSTANDING BETWEEN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, GOVERNMENT OF INDIA**

AND

**GOVERNMENTS OF CHHATTISGARH, JHARKHAND, ODISHA AND WEST BENGAL**

## 1. The Partners

This Memorandum of Understanding (MOU) is hereby made and entered into this .....day of ..... by and between the Ministry of Environment, Forest and Climate Change, Government of India (represented by the Project Elephant); and Governments of Chhattisgarh, Jharkhand, Odisha and West Bengal (represented by the respective Chief Wildlife Warden and hereinafter referred to as the State Government) hereinafter referred to as "MOU Partners".

## 2. Background

Asian elephant *(Elephas maximus)* as a species is listed in the 'Endangered' category of species in the IUCN/Red List. Threats such as fragmentation and loss of elephant habitats have severely disrupted their traditional migratory routes resulting in serious human elephant conflicts (HEC), poaching and killing of elephants. The elephants are being disrupted in their native range therefore they are colonizing in new areas which had not elephants for nearly a century and consequently causing severe conflict. The present situation requires concerted and planned interventions to safeguard the future of Asian elephants; and human lives and livelihoods.

HEC is a complex interaction between humans and elephants that has detrimental impact on both humans and elephants. Conflict between elephants and humans takes many forms ranging from loss of human life to loss of property. Elephant deaths due to retaliatory killing by humans have been reported by most range States. Elephant requires large foraging areas and live in closely bonded families, which show strong fidelity to their home ranges and they disperse from it only when there is severe disruption/disturbance.

Different types of planned and coordinated interventions at multiple levels in these range States are necessary for resolving HEC and conserving the species. The parties to this MOU are deeply concerned about the threats presented by HEC. They reaffirm their commitment to support each other to ensure the long-term survival of the elephant across its range and help stop the dispersal and colonizing by elephants in to new areas, which result in severe conflict and loss of human lives.

**3. Purpose**

This MOU outlines the purpose and structure of the Partnership and establishes a commitment towards implementing Regional Action Plan for Conservation of Elephants for East Central Region with special emphasis on Human Elephant Conflicts. The objectives of the Regional Action Plan are to:

a. Promote conservation of elephants and their habitat in the range states.
   - o Evaluate and map status of elephant habitat and prepare a long-term habitat conservation and management plan, including steps to restore / Retrofit depleted /weak /disrupted parts of the corridors.
   - o Evaluate the status of the elephant population and prepare a management plan to address man-induced elephant mortality and also population management, if necessary.

b. Devise and implement innovative measures to reduce of Human-Elephant Conflict.

c. Promote inclusive governance for planning and implementing Regional Action Plan.

d. Promote community participation at all levels in conservation of wild elephants and conflict management.

e. Commission research to create actionable intelligence on elephant management related issues.

f. Sharing of information on elephant movement, supporting each other in case of interstate movement of Elephants.

This MOU is not a contract. It is essentially a 'working document' that provides the overarching framework for the activities of the Partnership. It sets out the functions of the Partnership and the relationship between the Partners to ensure the efficient and effective implementation of the Regional Action Plan.

This MOU is not legally binding on any Partner and the detailed working arrangements of the Partnership may be changed by agreement of the majority of Partners. The Partners will work together to review the objectives and key deliverables of the Regional Action Plan every year.

**4. Duration**

This MOU shall be valid for an initial period of five years commencing from the date of execution and may be renewed thereafter with mutual consent of the partners. Either partner may terminate this MOU at any time by giving other partners at leastone-year prior notice in writing. Every five years this MOU will be reviewed and renewed by the Partners and amended, if required.

**5. Role of the Partners**

The partners shall communicate openly about their major concerns, issues or opportunities relating to the Partnership; learn, develop and seek to achieve full potential. The partners shall share information, experience, materials and skills to learn from each other and develop effective working practices, work collaboratively to analyze problems, identify solutions, eliminate duplication of effort, mitigate risks and reduce costs.

The partners shall prepare, implement and monitor the five year Regional Action Plan, with clear priority actions, outcomes and success measures, ensuring agreement and participation by all Partners; and provide strategic advice and recommendations to the Partners in creating, monitoring and reviewing policies for protecting elephants and managing HEC

**A. Role of the Ministry of Environment, Forest& Climate Change (through the Project Elephant)**

i. The Ministry of Environment, Forests and Climate Change will provide partial funding support under the Project Elephant for the preparation and implementation of the Regional Action Plan.

ii. Technical guidance in the form of advisory would be provided to the office of the Chief Wildlife Warden under intimation to the State Government within

the ambit of the provisions contained in the Wildlife (Protection) Act, 1972, with regard to conservation of elephants and their habitat with special emphasis on Human Elephant Conflicts. This would include a clear policy on addressing situations involving dispersing elephants.

iii. Collaborate with institutions to acquire new tools and technology and best practices being employed to conserve elephant and resolve HEC.

iv. Commission external evaluation studies periodically to assess the impact of investment made as per prescribed criteria.

v. The MoEF&CC shall constitute a Steering Committee under Chairmanship of the ADG, Project Tiger consisting of Chief Wildlife Wardens of the States and IGF & Director, Project Elephant within three months from the date of signing MOU for ensuring timely preparation and effective implementation of the Regional Action Plan. The Committee will approve the plan and develop norms for sharing financial assistance between center and state required for implementation of the plan. The Committee will ensure that sufficient financial resources and appropriately qualified human resources are available and authorized to fulfil the responsibilities set out in this MOU and the Regional Action Plan. The Committee will also collaborate with credible agencies outside the Government system to provide technical support to the States. The committee will meet at least twice a year. Director, Wildlife Institute of India or his representative will be a permanent invitee to the Committee meetings. Additionally, ADG, Project Tiger may co-opt experts as needed for the Committee meetings.

**B. Role of the State Governments**

i. The State Governments will be primarily responsible for jointly preparing and implementing the Regional Action Plan.

ii. The plan shall be prepared for the range land of the elephants for which the technical assistance and funding support will be provided by the Project Elephant.

iii. The habitat and corridors of elephants and the HEC affected areas shall be delineated by the State Governments.

iv. The staff vacancies shall be filled up by the State Governments for ensuring effective implementation of the Regional Action Plan. The State Governments

shall post motivated officers with proven track record, as the DFO/Deputy Director/Officer In-charge in the HEC affected areas, with a minimum tenure of three years (extendable if thesituation warrants).

v. The State Government shall constitute a High-Powered Committee under the Chairmanship of the Chief Secretary with the Principal Secretaries/Secretaries of the department of Forests, Home, Panchayat & Rural Development, Agriculture, Revenue and Water Resources, etc. as members within six months from the date of signing of the MOU to review timely preparation and effective implementation of the Regional Action Plan. Chief Wildlife Warden will be the Member Secretary of the Committee. Two Non-governmental institutions/individuals will also be nominated for a three-year period in the Committee on the recommendations of the Chief Wildlife Warden of the State. The Committee will address issues related to inter-state coordination, and coordination among various departments of the State for effective management of HEC.

vi. The State Government shall establish other governance structures, as required at various levels, to ensure effective implementation of the Regional Action Plan and management of HEC.

vii. The State Government shall create local institutions for ensuring community participation in protection of elephants and management of HEC. The State Government shall elicit public support through mainstreaming of wildlife concerns, to benefit local people and wild animals, apart from addressing human-wildlife animal interface.

viii. The State Government shall ensure capacity building of the local institutions and frontline staff for effective implementation of the Regional Action Plan and management of HEC.

ix. The State Government shall promote action for local intelligence gathering and information sharing arrangements for protection of the elephants and management of HEC. The State Government shall daily track the movement of elephants for facilitating forecasting of their movements and issue alerts in the adjoining areas.

x. The States shall collaborate to rationalise the policy for payment of *ex-gratia* and compensation towards HEC.

xi. The State Government shall place in the public domain the Regional Action Plan and details of execution within 6 months from the approval of the planon their official website apart from making available the same in local language to promote public vigil.

xii. The money released by the Project Elephant shall be made available to HEC affected areas for taking up the works proposed in the Regional Action Plan immediately, with due compliance of the normative guidelines and advisories of the Project Elephant.

xiii. The DFOs/Deputy Director/Officer In-charge of the HEC affected areas shall be empowered to spend the money provided by the Project Elephant for immediate execution of the schemes, as per the norms and procedures prescribed by the Project Elephant and the State Government.

xiv. The State Governments may also provide funds for mitigation of HEC and may also leverage CAMPA fund to implement the range of measures required for effectively dealing with HEC.

xv. The State Governments would ensure that research and validation of innovative methods including reproductive control would form an integral part of the strategy for dealing with the mitigation of HE

IN WITNESS WHEREOF, the representatives of the Partners to this Memorandum of Understanding being duly authorized have signed this Memorandum of Understanding as of the day, month and year first above written.

| **Signed for and on behalf of MoEF&CC** | **Signed for and on behalf of Government of Chhattisgarh** | **Signed for and on behalf of Government of Jharkhand** | **Signed for and on behalf of Government of Odisha** | **Signed for and on behalf of Government of West Bengal** |
|---|---|---|---|---|
| | | | | |
| Name & **Designation (With Stamp) Dated:** | Name & **Designation (With Stamp) Dated:** | Name & **Designation (With Stamp) Dated:** | Name & **Designation (With Stamp) Dated:** | Name & **Designation (With Stamp) Dated:** |

Annexure-6

# ELEPHANT CORRIDORS

## of India

2023

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

हाथी परियोजना
भारत सरकार
PROJECT ELEPHANT
GOVT. OF INDIA

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

*Design Layout & Map: Shri. Virendar Sharma & Shri. Udhayaraj A D.*
*Photo Credits: Dr. Lakshminarayanan N.*

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# ELEPHANT CORRIDORS

# of India

# 2023

सत्यमेव जयते

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

हाथी परियोजना
भारत सरकार

PROJECT ELEPHANT
GOVT. OF INDIA

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**Ministry of Environment, Forests & Climate Change**

Shri. Bhupender Yadav, Hon'ble Minister, EF&CC
Shri. Ashwini Kumar Choubey, Hon'ble MoS, EF&CC
Ms. Leena Nandan, Secretary, EF&CC
Shri. Chandra Prakash Goyal, DGF & SS, MoEF&CC

**State Forest Departments**

Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Meghalaya, Nagaland, Odisha, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal

**Advisors**

Dr. Satya Prakash Yadav, ADG (PT&E) & MS (NTCA)
Shri. Virendara Tiwari, Director, WII
Shri. Ramesh Kumar Pandey, IGF (PT&E) & Director, Project Elephant

**Contributors**

Dr. Parag Nigam, Scientist G & Nodal Officer, Elephant Cell, WII
Dr. Bilal Habib, Scientist F & Associate Nodal Officer, Elephant Cell, WII
Dr. K.M. Selvan, Scientist E, Project Elephant, EF&CC
Dr. N. Lakshminarayanan, Project Scientist, Elephant Cell, WII
Shri. Udhayaraj A.D., GIS Specialist, Elephant Cell, WII

**Additional Inputs**

Shri. Aditya Bisht, Consultant-B, Project Elephant, MoEF&CC
Dr. Anil Singh, Landscape Coordinator, Terai Arc Landscape, WWF-India
Dr. Bibhuti lahkar, Scientist, Aranyak
Dr. Prajna Panda, (former) National Coordinator, Elephant Cell, WII
Dr. D. Bhoominathan, Landscape Coordinator, Nilgiri – Eastern Ghats, WWF-India
Shri. Rakesh Kalva, Consultant, Andhra Pradesh Forest Department
Shri. R. Raghuram, Himagiri Wildlife Trust, Chamrajnagar, Karnataka
Shri. Imnawapang Jamir, PhD scholar, Mizoram University
Ms. Aakriti Singh, Senior Research Fellow, Elephant Cell, WII

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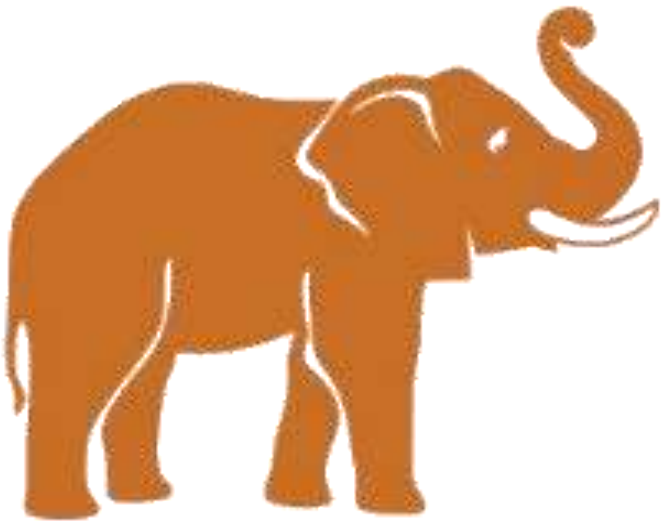


# Preface

Asian elephants (*Elephas maximus*) are among the most endangered species in the world. Currently, elephants occur in highly fragmented populations across 13 range countries in Asia. Among these countries, India holds the largest (> 60%) and one of the most stable elephant populations within its political boundary. India's population of wild elephants has been holding steady in the range of 28,000 to 30,000 during the past decade. This population occurs in 1,00,000 to 1,20,000 $km^2$ of diverse habitats across four major elephant-bearing regions in the country. Being a highly mobile species with relatively large home ranges spanning 100 to 3000 $km^2$ as recorded in India, integrity of elephant habitats rests on maintaining contiguity between habitat patches.

Wildlife corridors can be envisioned as strips of habitat or movement pathways that connect otherwise disconnected habitat patches. Wildlife corridors facilitate animal movement between habitat patches; and in the process maintain the long-term demographic and genetic viability of elephant populations. It is amply recognized that demographic isolation and lack of genetic viability could threaten elephant populations with extinction risks. Considering this, securing elephant corridors remains a central strategy for elephant conservation in the country. The Indian Government's Elephant Task Force report of 2010 (known as the Gajah report) listed 88 corridors across the country. In India, the elephant corridors have not only been identified, but efforts were invested towards restoration. Due to concerted collaborative efforts involving the state Forest Departments, MoEFCC, and with due support from non-governmental institutions, few of the critical corridors across India have been successfully restored during the last few decades. This include: (1) Kaniyanpura – Moyar corridor in Bandipur landscape of Karnataka (2) Chilla – Motichur corridor in the Rajaji landscape of Uttarakhand (3) Thirunelli – Kudarakote corridor in the Wayanad landscape of Kerala (4) Segur elephant corridor in Mudumalai landscape of Tamil Nadu (5) Kuldiha – Hadgarh corridor in the Similipal landscape of Odisha (6) Edayarahalli – Doddasampige corridor in MM Hills and BR Hills landscape of Karnataka (7) Mudahalli – Talavadi corridor in the BR Hills and Sathyamangalam landscape in Tamil Nadu and Karnataka and a few others that are in the process of being restored.

Drawing from the aforementioned examples across India, it is certain that timely identification and continuous monitoring of elephant corridors often serve as precursors towards successful restoration of elephant corridors. Therefore, institutionalizing management of elephant corridors assumes greater importance in the country. Apropos this standpoint, the Project Elephant, during its 16$^{th}$ Steering Committee meeting held during 2022 under the chairmanship of the Hon'ble Minister of Environment, Forests, and Climate Change, Government of India informed that the task of ground-validating the elephant corridors listed in the Gajah report has been embarked upon in collaboration with the state Forest Departments of the elephant range states. The ground-validation of elephant corridors listed

in the Gajah report was deemed to be pertinent as the report is over 10 years old and tracking the changes to the corridors would be timely.

The Gajah report listed 88 corridors, which was used as the basis in the current endeavor of ground-validating elephant corridors. Additionally, the elephant range states were also sought to provide the list of identified elephant corridors in their respective states so that those corridors can also be ground-validated for inclusion in the report.

For a long-lived, wide ranging mega-herbivore like elephants that occur in a mosaic landscape comprising of forests interspersed with human-use areas, and often involving two or more states, identifying corridors is challenging. It would require long-term elephant movement data to accurately delineate the boundaries of the elephant corridors. The objective of this report is to just indicate the location of the identified elephant corridors in a map. The exact bounds of the corridor are not provided although some of the states have already demarcated the exact outline of the elephant corridors including that of the land-use within each of the corridor. Some of the states like Odidha for instance have even ground-marked the elephant corridors with demarcation pillars.

The Project Elephant reiterates that the first step towards safeguarding an elephant corridor is to identify it on time. After identification, it would be important to delineate the boundaries both in a map as well as in the ground, and assess the land-use within the corridor. Project Elephant envisions that the exact boundary of all the elephant corridors listed in the report can be delineated following a data-driven approach through the collective efforts of the state Forest Departments, Project Elephant, Research Institutions, and other stakeholders in the future.

A word of caution pertinent to note is that the list of corridors presented in the report is best considered as the minimum number of elephant corridors occurring in the country. Further, the number of elephant corridors presented in the report is subject to modification based on field data and inputs from the State Governments, particularly in light of the observed fluxes in elephant movement range use patterns possibly triggered by complex underlying processes. This is particularly true in case of elephant populations, which are often dispersing across landscapes with fluid home ranges as observed in the east-central region.

Given the strategic importance of maintaining habitat connectivity through a network of elephant corridors, it would be pertinent to start periodically monitoring the elephant corridors in line with the periodic population estimation of elephants. Such focused monitoring could not only be helpful in the timely securing of the corridors, but also aid in understanding elephant movement patterns, predicting human-elephant conflict so as to devise proactive conflict mitigation strategies.

**Ramesh Kumar Pandey, IFS**
**IGF (PT&E) & Director, Project Elephant**

# Synopsis

1. **Background:**
   Securing elephant corridors has long been considered an important strategy to conserve elephants and minimize human-elephant conflict in the Indian context. The Elephant Task Force report of the Government of India (known as the Gajah report) pertaining to the year 2010 listed 88 elephant corridors. During the 16th Project Elephant Steering Committee meeting in April 2022, it was reflected that the Gajah report was published 13 years prior, and thus, it would be pertinent to ground-validate the status of the elephant corridors in India in the present.

2. **Definition of corridor:**
   - The parsimonious definition of the elephant corridor is that it is a strip of land that facilitates the movement of elephants between two or more viable habitat patches. Movement of elephants away from forest habitats into the human domain without connecting to viable habitat patches may not be considered elephant corridors.
   - In this report, the elephant corridors were classified as "active" if effectively used by elephants, as reported by the State Forest Department during ground-validation surveys. The elephant corridors where elephant use was perceived to be virtually nonexistent by the Forest Department were graded as "impaired". For elephant corridors that were reportedly active, different categories of current use of corridors by elephants have also been mentioned.

3. **Approach followed for ground-validation and mapping:**
   - The Forest Departments have provided the list of elephant corridors for the respective states for ground validation. Such lists also included the interstate elephant corridors. For states that did not provide the list, the corridors listed in the Gajah report of 2010 were used for ground validation. Subsequent to ground validation, the duly filled-in data forms elucidating the attributes of elephant corridors were obtained from the state Forest Departments to prepare the maps and tables presented in the report.
   - All the elephant corridors listed in the Gajah report and additionally provided by the state Forest Departments were validated in the field by a joint team of Forest Department personnel from the respective Forest Divisions and personnel nominated by the Project Elephant, often involving experts with local knowledge.
   - In maps presented in the report, only the indicative direction of the elephant corridor has been shown. The forest cover map has been used as the base layer. The exact boundaries of the elephant corridor have not been demarcated.

4. **Summary:**
   - A total of 150 elephant corridors were reported from 15 elephant range states across the four elephant-bearing regions of India. For Uttarakhand and Karnataka, both the list of corridors, and the filled-in data forms were not received. Therefore, the list of corridors provided in the Gajah report was used for ground validation.

- West Bengal has the highest number (n = 26) of identified elephant corridors in India, accounting for over 17% of all the reported elephant corridors in the country.
- Among the four elephant-bearing regions, nearly 35% (n = 52) of the elephant corridors were in the East-central region, followed by 32% (n = 48) in the North-east region. The Southern region, which harbors the largest elephant population in India accounts for 21% (n = 32) of the elephant corridors in India. The Northern region that harbours the smallest of the four regional elephant populations, has the least number of elephant corridors, accounting for 12% (n = 18) of all the reported elephant corridors in the country.
- About 84% (n = 126) of the identified elephant corridors occur within the state boundaries. About 13% (n = 19) are interstate elephant corridors that extend into two or more states. There were 6 transnational corridors between India and Nepal.
- In 40% (n = 59) of the elephant corridors, the intensity of use by elephants has reportedly increased. In about 19% (n = 29) of the elephant corridors, the intensity of use by elephants has been observed to be stable with minimal changes during the last few years. However, in another 19% (n = 29) of the elephant corridors, the intensity of use, as observed during the last few years, was perceived to be decreasing. Fifteen (10%) elephant corridors have been impaired over time and would require restoration to facilitate elephant movement.
- Of the 88 elephant corridors that were listed in the Gajah report, 74 were found to be presently active with respect to elephant use.
- To protect and further augment elephant corridors so as to improve the resilience of elephant habitats, continuous monitoring of the elephant corridors would be critical. The priority of the states would be to delineate the boundaries of the elephant corridors and include them in their respective working plans and management plans.

## Disclaimer

*This report is an outcome of the collective efforts of Project Elephant of the MoEFCC and the State Forest Departments with technical support from the Wildlife Institute of India, and involved the ground validation of 150 elephant corridors across 15 States, which took nearly two years to complete. Being a large mammal with high mobility, elephants are landscape species with dynamic range needs that often span state boundaries. Therefore, the number of corridors presented in the report is best considered a minimum. As and when additional information is obtained from the States, the report will be modified suitably. There are landscapes in which elephant ranges have expanded recently and even extending into States where elephant presence was not reported earlier. In such States, after assessing the long-term prospects of harboring viable elephant populations, a data-driven approach to identifying elephant corridors needs to be prioritized. It is envisaged that the elephant range State Forest Departments continue to monitor elephant corridors in their respective landscapes and furnish information to Project Elephant so that the report can remain updated.*

# GENERAL INTRODUCTION

## Wildlife Corridors in Landscapes Fast Changing

Globally, the natural environment is undergoing rapid changes in the face of human advancement, resulting in fragmentation, shrinkage, and degradation of wildlife habitats. These landscape changes can have profound and widespread implications for biodiversity conservation. In particular, habitat fragmentation can have long-term negative consequences for the persistence of endangered wildlife populations. The rate of fragmentation of natural habitats has been unprecedented in the known history of the planet. Given this, the long-term persistence of several species of wildlife would depend on their ability to survive in human–dominated fragmented landscapes. In such human–dominated landscapes, wildlife movement is often facilitated by the network of corridors.

Wildlife corridors are referred to in different terms, like 'conduits', 'landscape linkages', 'stepping stones', 'green belts', 'green ways', and myriad others (Bennet, 2003). All these different terms tacitly imply that wildlife corridors are essentially landscape linkages that facilitate wildlife movement between habitat patches in fragmented landscapes. As corridors are directly beneficial in buffering wildlife populations from the perils of habitat fragmentation, they have become a cornerstone for wildlife conservation across the globe. Wildlife corridors help retain permeability between habitat patches and enable animal movement. Vital functions of wildlife corridors include facilitation of wildlife dispersal; seasonal migrations, and gene flow within and across populations. For large herbivores like elephants with voluminous range needs, corridors are also essential in mitigating human-wildlife conflict in human-dominated landscapes. Loss and degradation of corridors can exacerbate threats of population isolation, such as inbreeding within a small group of animals, that compromise the long-term viability of wildlife populations.

There are three extant species of Proboscideans in the world. Among them, two species, namely *Loxodonta Africana* and *Loxodonta cyclotis* occur in Africa. The third species, *Elephas maximus* occurs in Asia, where it is distributed in 13 range countries in the wild. The Asian elephant range has suffered major contraction and fragmentation (Leimbgruber et al 2003). The remnant populations occur as "metapopulations", whereby, otherwise geographically isolated elephant populations are connected through the dispersal of a few individual elephants. Such dispersals are often facilitated by the network of wildlife corridors. Since elephant habitats in India are distributed over human-dominated areas, maintaining connectivity among populations is achieved through a network of corridors. In the Indian context, an elephant corridor is usually a linear strip of vegetation that provides a pathway between two or more forest patches.

## Distribution and Population of Elephants in India

The global population of the *Elephas maximus* is around 50,000 (Williams et al. 2020). In that *c.* 30,000 (>60%) elephants occur within the political boundary of India. The distributional range of elephants in India is around 1,00,000 to 1,20,000 km$^2$. Within India, elephants occur in four broad geographic regions namely the Northern, North-east, East-central and Southern with discrete regional metapopulations.

Additionally, there is a small population of feral elephants in the Andaman & Nicobar Islands. The region-specific elephant population is provided in Table-1.

**Table-1: Population Estimates of Elephants as per the Synchronized Elephant Census, 2017**

| S.No | Region | State | Estimate* |
|---|---|---|---|
| 1 | Northern | Uttarakhand | 1839 |
| 2 | | Uttar Pradesh | 232 |
| 3 | | Bihar | Not reported. Sporadic |
| 4 | | Haryana | 7 (sporadic) |
| 5 | | Himachal | 7 (sporadic) |
| 6 | North-east | Assam | 5719 |
| 5 | | Arunachal Pradesh | 1614 |
| 6 | | Meghalaya | 1754 |
| 7 | | Nagaland | 446 |
| 8 | | Manipur | 9 |
| 9 | | Northern West Bengal | 488 |
| 10 | | Mizoram | 7 |
| 11 | | Tripura | 102 |
| 12 | East-central | Odisha | 1976 |
| 13 | | Jharkhand | 679 |
| 14 | | Southern West Bengal | 194 |
| 15 | | Chhattisgarh | 247 |
| 16 | | Madhya Pradesh | 7 |
| 18 | Southern | Karnataka | 6049 |
| 19 | | Kerala | 5706 |
| 20 | | Tamil Nadu | 2761 |
| 21 | | Andhra Pradesh (southern) | 65 |
| 22 | | Maharashtra (southern) | 6 |
| 23 | Island | Andaman & Nicobar | Not available |

* The population status of elephants in many states have changed since the 2017 synchronized elephant census. The all-India population estimation is currently being carried out and the country-wide estimates are expected to be available by end of 2023.

## An Overview of Elephant Corridors in India

In India, the importance of corridors in maintaining integrity of elephant habitats is long recognized. Pioneering scientific studies on elephant ecology across different landscapes of the country using field intensive methods like the radio-telemetry and other approaches have indicated elephant home ranges to be large spanning 100 to 3,000 km$^2$ of diverse habitats (Sukumar, 2003). These home ranges often encompass forest patches connected through a network of elephant corridors.

As a Pan-India effort, with support from the Project Elephant, the Wildlife Trust of India (WTI) came up with "Right of Passage: Elephant Corridors of India" during the year 2005. The Right of Passage provided a comprehensive insight into elephant corridors across the four regional landscapes. Subsequent to this, the Elephant Task Force of the Government of India listed 88 corridors in to the Gajah report published during 2010.

In addition to these published reports on elephant corridors, numerous State Forest Departments of the elephant range states have also taken cognizance of the importance of corridors and started objectively identifying them by closely monitoring elephants. The States have also included the corridors in the working plans of the territorial divisions and the management plans of the protected areas.

## Scope of the Report

- In the report, elephant corridor is defined as the pathway/s that elephants use to move between habitat patches to fulfill basic life history requirements, including within home range habitat-use, seasonal migrations, and dispersal. The occassional movement of elephants into new areas that do not have viable habitats to support elephant populations is not considered a corridor.

- In the report, elephant corridors are depicted as indicative pathways connecting habitat patches. The length and width of the elephant corridor provided in the report are indicative. The exact dimension of the corridor is not provided, as very few States have delineated the boundaries of the elephant corridor. Based on the indicative location of the elephant corridors, it is desired that the State Governments demarcate the boundaries of the corridors using data on forest cover, elephant movement, land-use, and human–elephant conflict around the corridors.

- The current status of elephant use of the corridors was ascertained based on the information provided by the State Forest Departments during the ground validation surveys carried out by the teams nominated by Project Elephant. For ground validation, a structured questionnaire was provided to the field officers of the Forest Department (Annexure-3). All the elephant-range States in the country, with the exception of Uttarakhand, Karnataka and Chhattisgarh have sent the duly filled-in questionnaires from which the basic details were collated. For Chhattisgarh, the elephant corridors were identified by the Wildlife Institute of India in consultation with the Chhattisgarh Forest Department. For Uttarakhand and Karnataka, details of the elephant corridors were obtained from the Gajah report and Right of Passage (2017 version)

- It is important to note that unlike the seasonal intensity of habitat-use, important functions of the corridors like gene flow and dispersal are difficult to assess in the field, even if elephants are regularly monitored. Therefore, the current status of corridors elucidated in the report is to be considered indicative.

- Elephant corridors are dynamic landscape elements that can be potentially influenced by myriad factors like elephant distribution, abundance, habitat configuration, and other landscape characteristics. Therefore, the corridors listed for each region and the state therein are best

considered minimum. In regions where elephant distribution is fluid, such as in the states of the east-central region, delineating corridors can be challenging as elephants keep shifting their ranges constantly. Similarly, in highly fragmented landscapes where the forests and human–use areas are highly interspersed and thus the boundaries are diffuse, delineating corridors is challenging.

## Approach Followed in the Report

***1. Ground Validation***

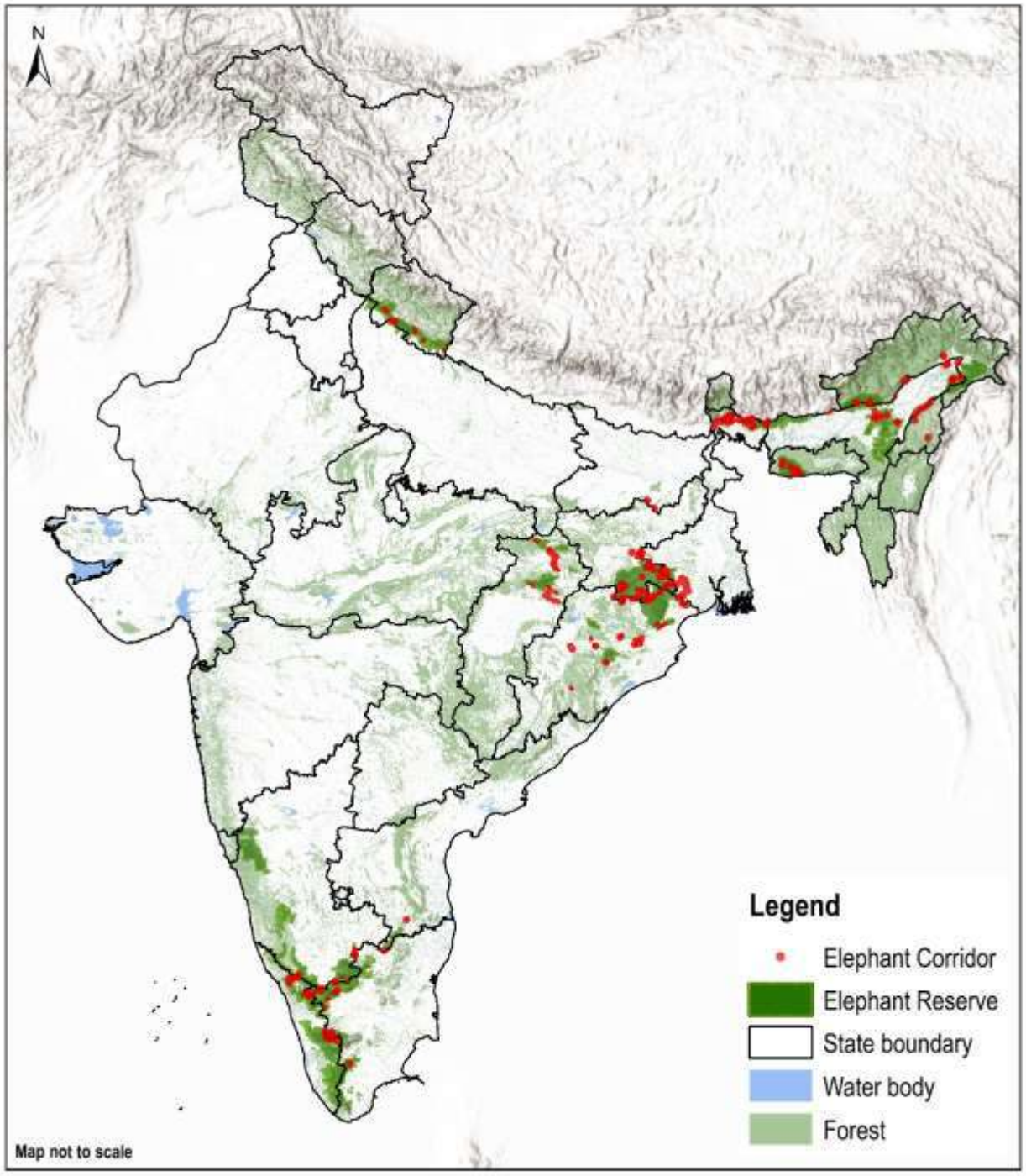
For every elephant range State in India, a committee comprising members from Project Elephant and experts from other institutions was constituted. The committee's mandate was to visit the elephant corridors along with Forest Department officials and fill out the questionnaire provided by Project Elephant, which gauges whether the corridor is active or not. The committee worked under the direct supervision of the Director, Project Elephant and the Chief Wildlife Wardens of the respective States. The duly filled-in datasheets were forwarded to the Project Elephant Division by the respective States.

***2. Mapping***

Mapping elephant corridors entailed indicating the location of the corridor (through a series of arrows) on a forest cover raster layer overlaid with administrative boundaries like forest beats, forest divisions, and protected areas. The outline boundaries of the corridors were not provided.

***3. Organization of the Report***

The elephant corridors detailed in the report have been organized based on the four regional elephant populations. Corridor-specific maps, along with baseline information related to dimensions, administrative details, intensity of use by elephants, and the current status of use, were provided in a table. Wherever appropriate, recommendations provided by the Forest Department staff to improve the status of the corridors were included.



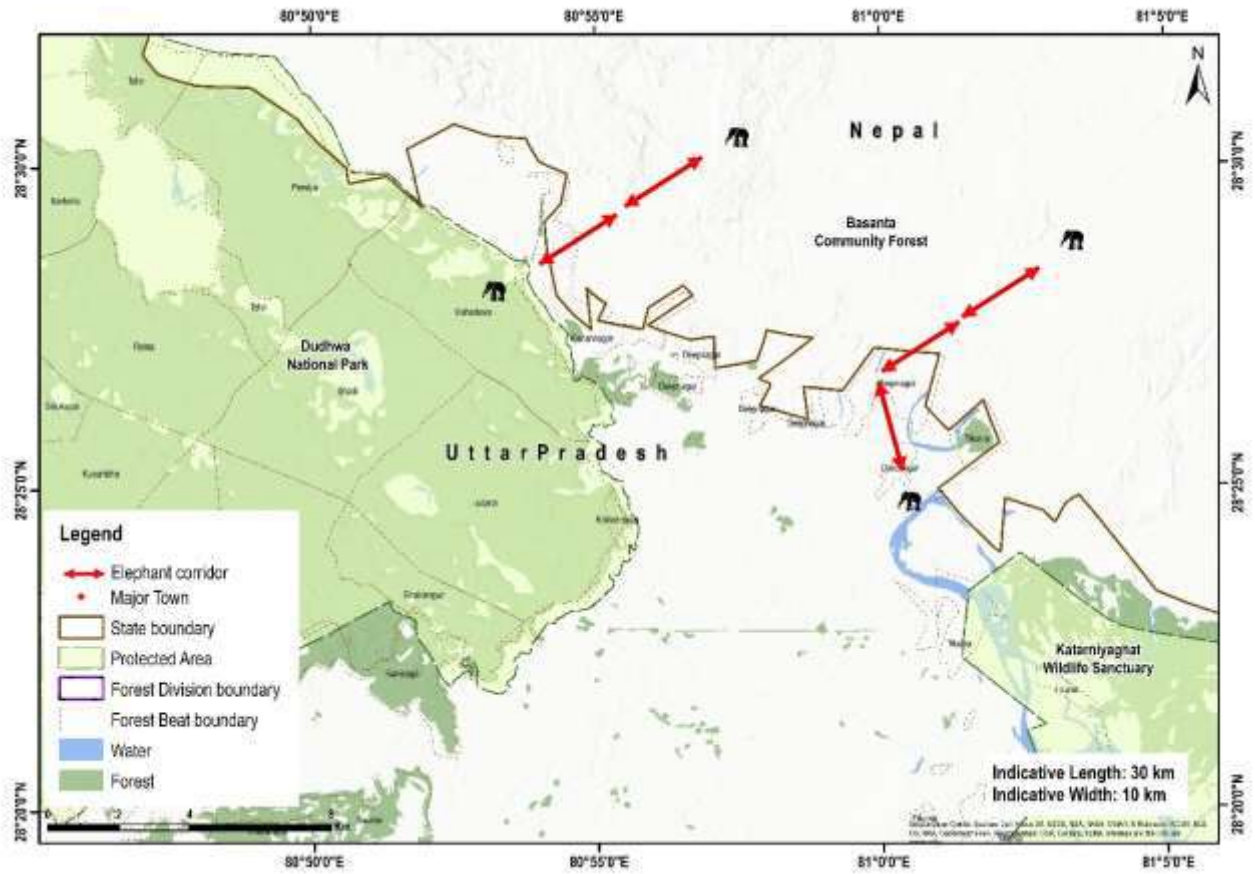

**Elephant coridors of India as on 2023**

# *Elephant Corridors*

# Northern Region

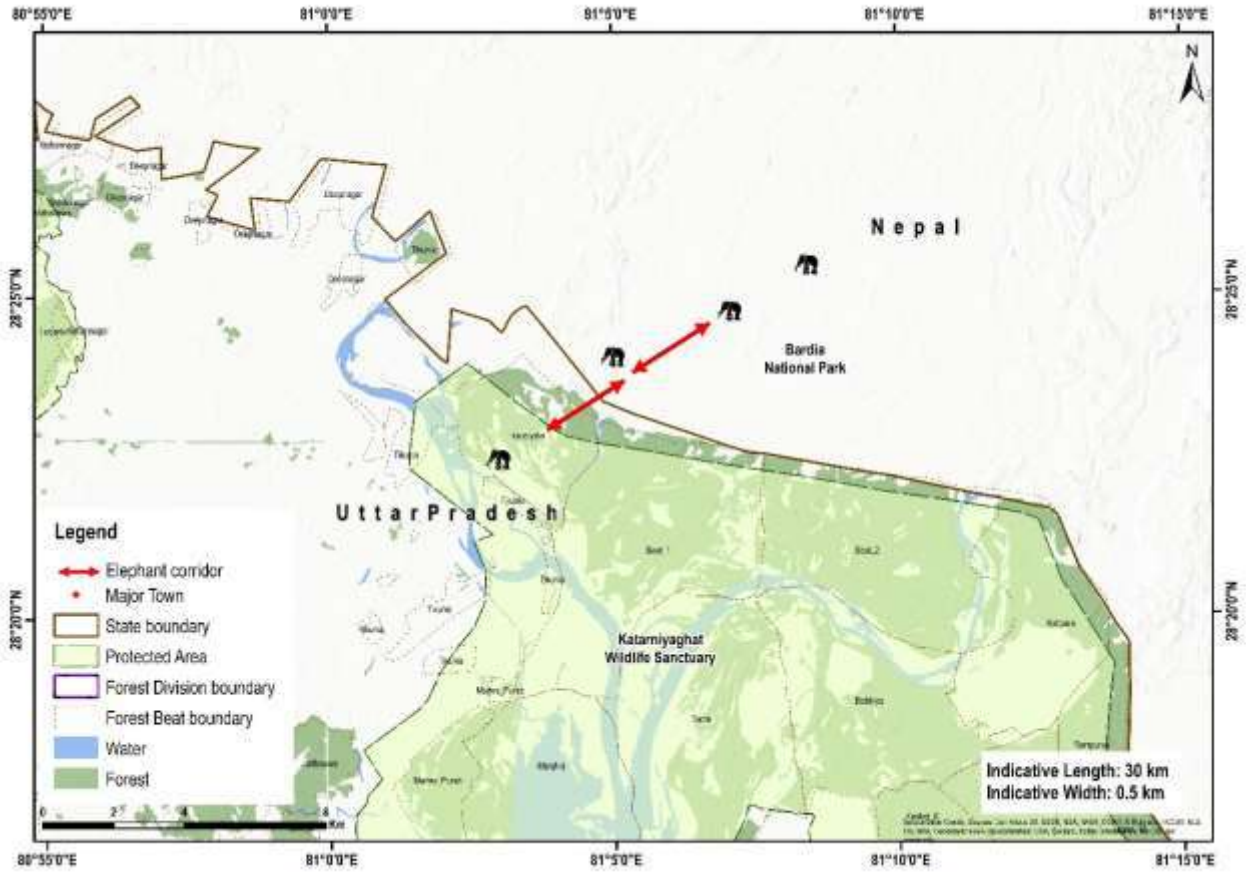
## 1. Basanta Corridor (transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Dudhwa National Park, India to Bardia National Park, Nepal. This is a transboundary corridor with majority of its portion in Nepal, and a very narrow connectivity exists with Dudhwa National Park. There are two different routes used by elephants pertaining to this corridor.** |
| **State** | Uttar Pradesh (and Nepal) |
| **Indicative length and width** | Length = 30 km, Width = 10 km |
| **Geo Coordinates** | 28.464199°, 80.908027° |
| **Forest ranges falling within corridor** | North Nighasan and Belrayan range |
| **Revenue villages falling within corridor** | 5 |
| **Ecological importance** | Basanta corridor is used by elephants for movement between Dudhwa NP, India and Bardia NP, Nepal |
| **Habitat type** | Sal and Mixed forest |
| **Major land use** | River, Forest, Agricultural land and Settlements |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | 13 |
| **Major bottleneck** | Near Raghunagar in Indian side and along Mohana river in Nepal side |
| **Linear infrastructure in the corridor** | Proposed Indo-Nepal Border road |
| **Recommendations by the forest department to improve the corridor** | 1) Trans-boundary co-operation with Nepal to jointly restore Basanta corridor.<br>2) Build flyover along Indo-Nepal Border Road<br>3) Regular and intensive monitoring of elephants jointly with Nepal<br>4) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



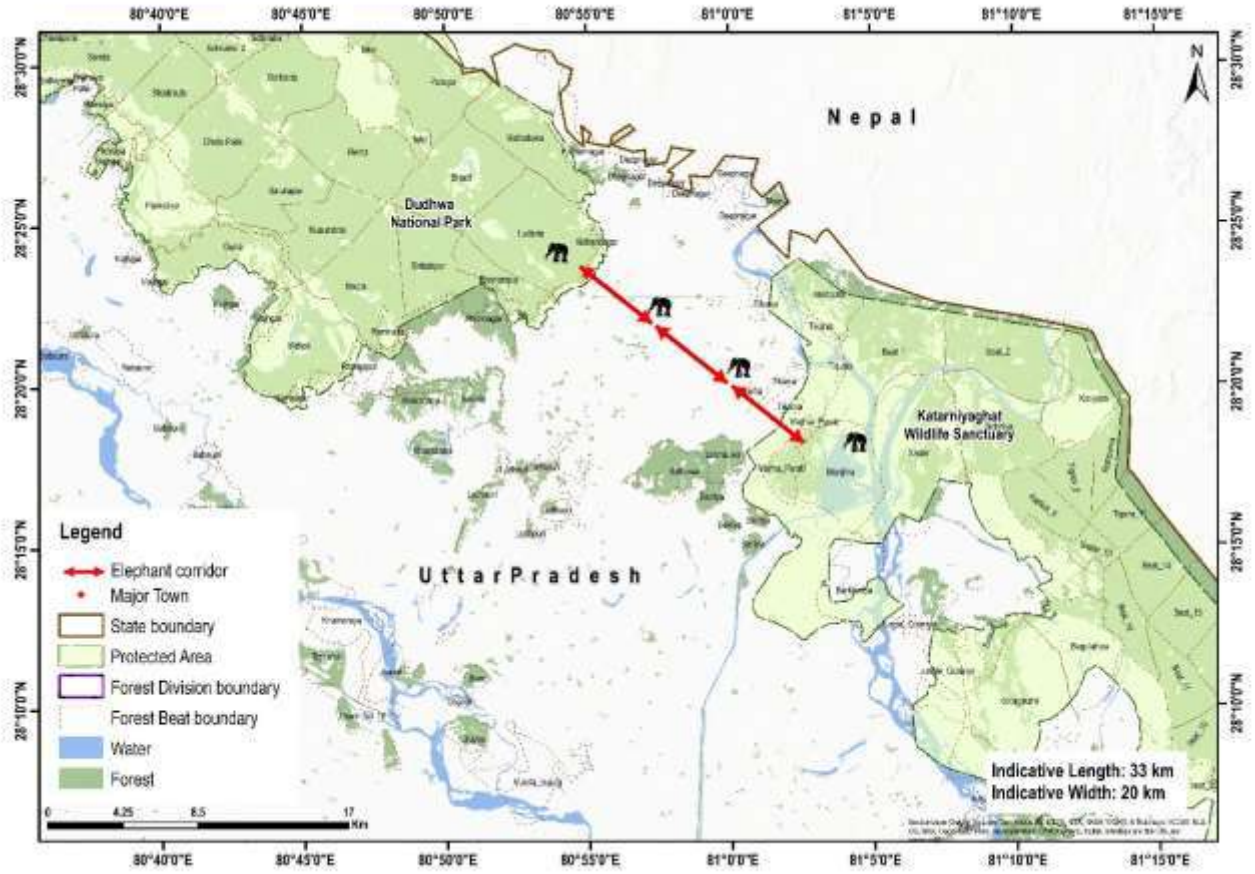
## 2. Chhedia Corridor (transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Katerniaghat Wildlife Sanctuary, Bahraich in the Indian side with Bardia National Park, Bardia district in Nepal. This is a transboundary corridor with majority of its portion in Nepal, and with a very narrow connectivity existing with Katerniaghat Wildlife Sanctuary** |
| **State** | Uttar Pradesh (and Nepal) |
| **Indicative length and width** | Length = 30 km, Width = 0.5 km |
| **Geo Coordinates** | 28.399743°, 81.063869° |
| **Forest ranges falling within corridor** | Katenriaghat range |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | Chhedia corridor is used by elephants to move between Katenriaghat WLS, India and Bardia NP, Nepal. Tigers and rhinos also move between Katenraighat WLS and Bardia NP via this corridor |
| **Habitat type** | Sal and Mixed forest with interspersing riverine tracts |
| **Major land use** | River, Forest, Agricultural land and Settlements |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | 56 |
| **Major bottleneck** | Rapid expansion of human habitation in Nepal side, dependency of people on forest corridor |
| **Linear infrastructure in the corridor** | Proposed Indo-Nepal Border road |
| **Recommendations by the forest department to improve the corridor** | 1) Trans-boundary co-operation with Nepal to jointly restore Basanta corridor.<br>2) Build flyover along Indo-Nepal Border Road<br>3) Regular and intensive monitoring of elephants jointly with Nepal<br>4) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



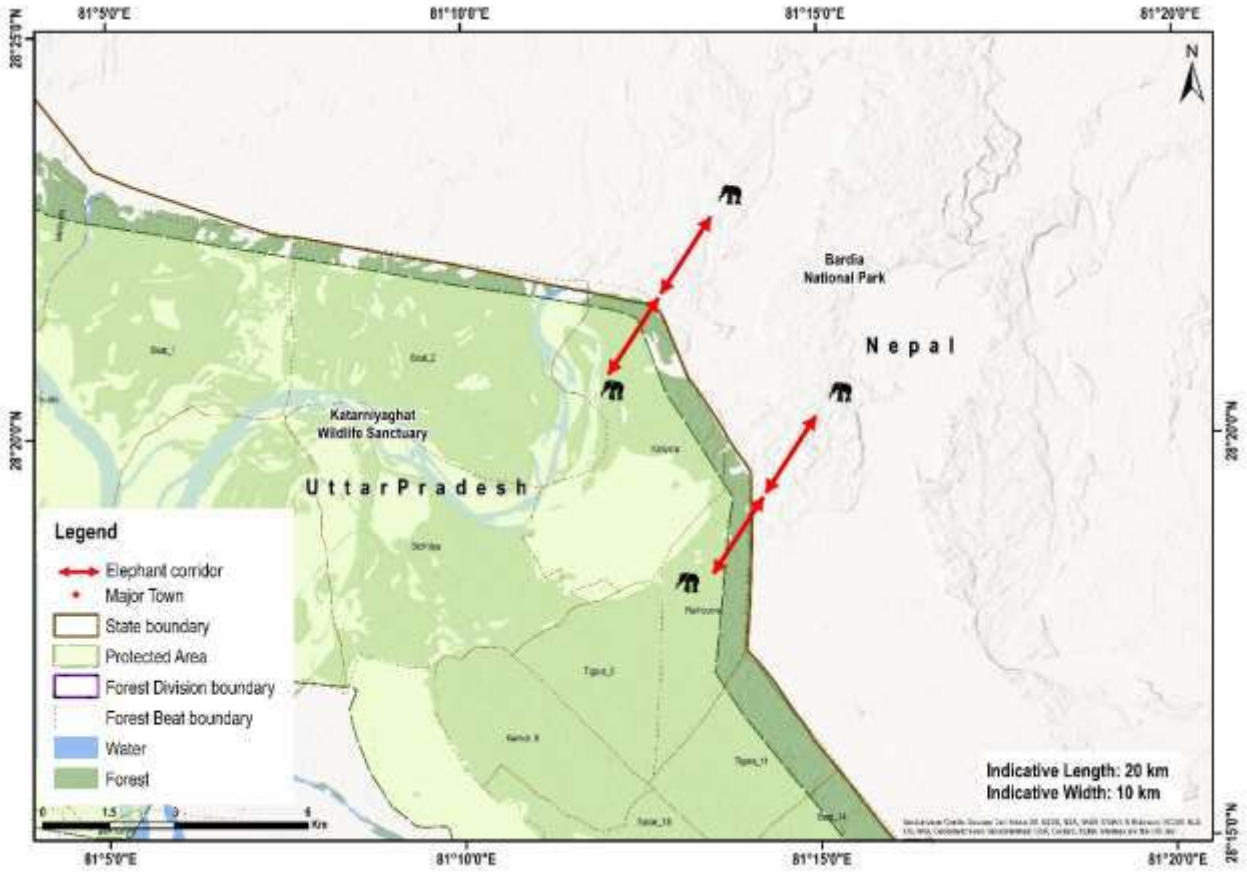
## 3. Dudhwa-Katerniaghat Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Katerniaghat Wildlife Sanctuary with Dudhwa National Park.** |
| **State** | Uttar Pradesh |
| **Indicative length and width** | Length = 13 km (along Mohana river in north and 20 km along Suheli river in south), width = 10 km |
| **Geo Coordinates** | 28.352212°, 80.967671° |
| **Forest ranges falling within corridor** | Belrayan and Katenriaghat range |
| **Revenue villages falling within corridor** | 60 |
| **Ecological importance** | Dudhwa-Katerniaghat corridor is used by elephants to move between Dudhwa NP and Katerniaghat WLS through buffer zone of Dudhwa TR |
| **Habitat type** | Northern tropical semi-evergreen forest, northern Indian moist deciduous forest, tropical seasonal swamp forest and northern tropical dry deciduous forest. |
| **Major land use** | Predominantly agricultural |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | 13 elephants in Belrayan range of Dudhwa NP<br>66 elephants in Katerniaghat range of Katenriaghat WLS |
| **Major bottleneck** | Mohana river and Suheli river are critical areas whereas human habitations act as bottleneck |
| **Linear infrastructure in the corridor** | 1) Proposed Indo-Nepal Border road<br>2) Meter gauge from Mailani to Nanpara |
| **Recommendations by the forest department** | 1) Regular and intensive monitoring of elephants<br>2) Developing participatory conservation approach to allow safe passage for elephants through farmlands<br>3) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Status of the corridor** | Active. Intensity of use by elephants stable. |



## 4. Khata Corridor (transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Katerniaghat Wildlife Sanctuary, India and Bardia National Park, Nepal. This is a transboundary corridor.** |
| **State** | Uttar Pradesh (and Nepal) |
| **Indicative length and width** | Length = 20 km, Width = 10 km |
| **Geo Coordinates** | 28.357627°, 81.213294° |
| **Forest ranges falling within corridor** | Katenriaghat and Nishangara Ranges |
| **Revenue villages falling within corridor** | 5 |
| **Ecological importance** | Khata corridor is used by elephants to move between Katenriaghat WLS, India and Bardia NP, Nepal. Tigers (*Panthera tigris*) and rhinos (*Rhinocerus unicornis*) also move between Katenraighat WLS and Bardia NP via Khata corridor |
| **Habitat type** | Sal and Mixed forest |
| **Major land use** | River, Forest, Agricultural land and Settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 56 elephants in Katerniaghat range |
| **Major bottleneck** | Near Katiyara and Rampurwa beats in Indian side and Khata area in Nepal side |
| **Linear infrastructure in the corridor** | 1) Proposed Indo-Nepal Border road<br>2) About 10 km of high-tension power line |
| **Recommendations by the forest department to improve the corridor** | 1) Trans-boundary co-operation with Nepal to jointly restore Khata corridor<br>2) Deploying sufficient mitigation measures like flyover along Indo-Nepal border road<br>3) Regular and intensive monitoring of elephants jointly with Nepal<br>4) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |

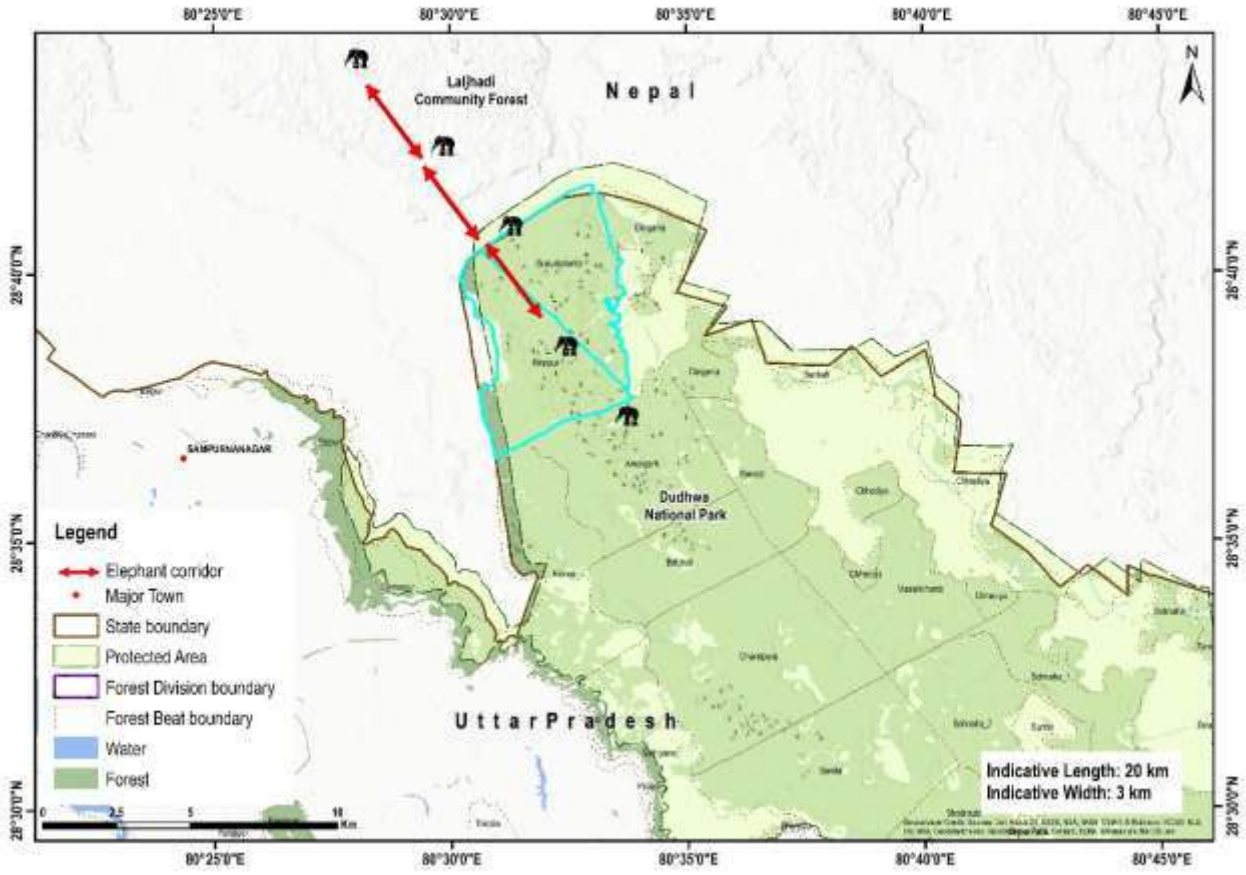


## 5. Laggabagga-Tatarganj-Shukhlaphanta Corridor (transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Pilibhit Tiger Reserve and Buffer Zone Division (North Kheri), Dudhwa Tiger Reserve, India to Shukhlaphanta National Park, Nepal** |
| **State** | Uttar Pradesh (and Nepal) |
| **Indicative length and width** | Length = 25 km, width = 10 km |
| **Geo Coordinates** | 28.765669° 80.199006° |
| **Forest ranges falling within corridor** | Barahi and Sampuranagar ranges |
| **Revenue villages falling within corridor** | 25 |
| **Ecological importance** | Lagga-bagga corridor is used by elephants and other mammals viz. tiger (*Panthera tigris*), leopard (*Panthera pardus*), rhinos (*Rhinocerus unicornis*) and swamp deer (*Rucervus duvaucelli*) to move between Pilibhit TR in India and Shukhlaphanta NP, Nepal. |
| **Habitat type** | Sal-dominated mixed forest and grasslands |
| **Major land use** | River, Forest, Agricultural land and Settlements |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | 22 |
| **Major bottleneck** | Near Tharupatti, Gunhan, Tatarjang in Indian side |
| **Linear infrastructure in the corridor** | Proposed Indo-Nepal Border road |
| **Recommendations by the forest department to improve the corridor** | 1) Trans-boundary co-operation with Nepal to jointly restore Lagga-Bagga corridor<br>2) Deploying sufficient mitigation measures like flyover along Indo-Nepal border road<br>3) Regular and intensive monitoring of elephants jointly with Nepal<br>4) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |

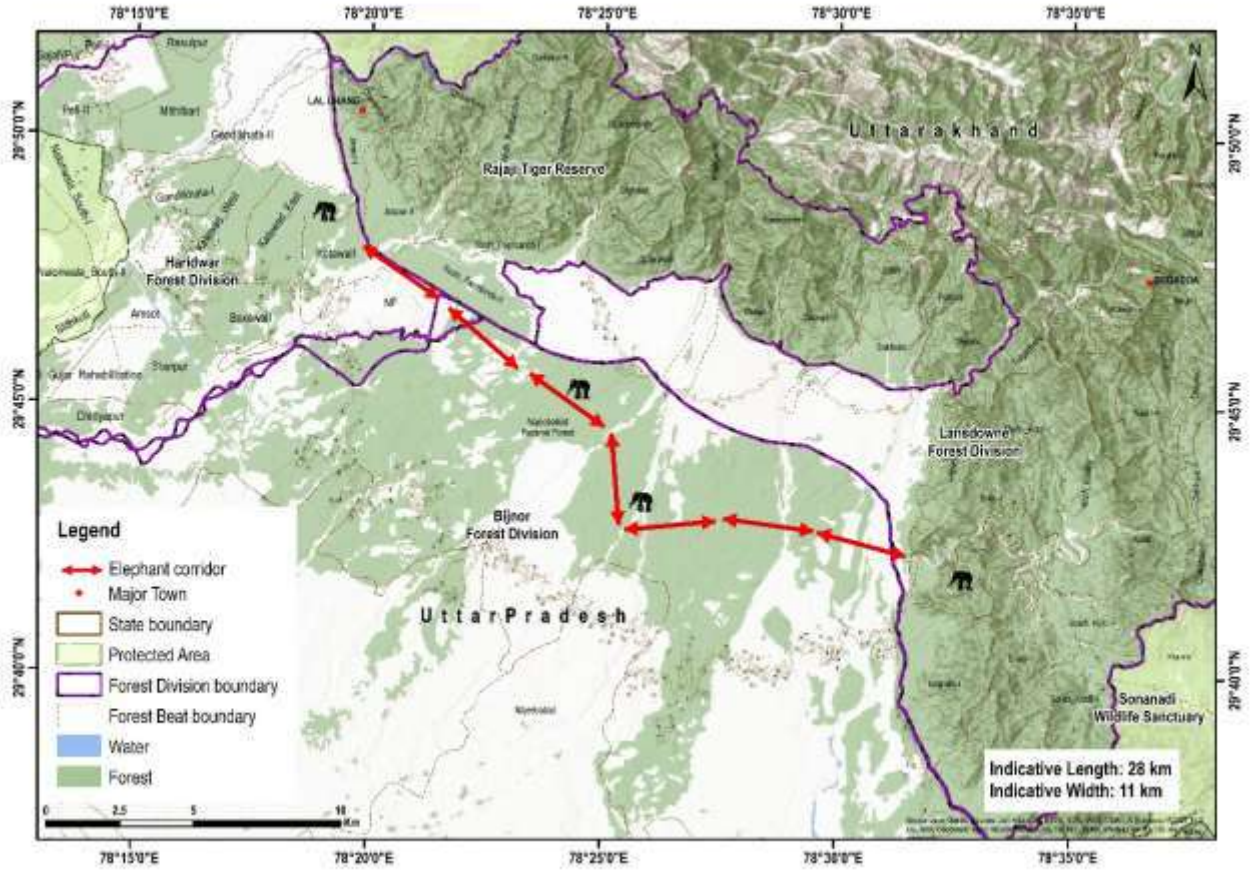
## 6. Laljhadi Corridor (transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Dudhwa Tiger Reserve, India to Shukhlaphanta National Park, Nepal. This is a transboundary corridor with majority of its portion in Nepal side and a very narrow connectivity along Dudhwa NP** |
| **State** | Uttar Pradesh (and Nepal) |
| **Indicative length and width** | Length = 20 km, width = 3 km |
| **Geo Coordinates** | 28.669241°, 80.502309° |
| **Forest ranges falling within corridor** | Gauriphanta range |
| **Revenue villages falling within corridor** | 1 |
| **Ecological importance** | Laljhadi corridor serves as a migratory route for elephants for movement between Dudhwa NP, India and Shukhlaphanta NP, Nepal |
| **Habitat type** | Sal and Mixed forest |
| **Major land use** | River, Forest, Agricultural land and Settlements |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | 79 |
| **Major bottleneck** | Rapid expansion of human habitations in Nepal side |
| **Linear infrastructure in the corridor** | 1) State Highway 90 (Palia to Gauriphanta road)<br>2) Proposed Indo-Nepal border road<br>3) Trench for 2 km |
| **Recommendations by the forest department to improve the corridor** | 1) Transboundary co-operation with Nepal to jointly restore Laljhadi corridor.<br>2) Afforestation along Donda river on Nepal side to develop cover for wildlife<br>3) Deploying sufficient mitigation measures like flyover along Indo-Nepal border road<br>4) Regular and intensive monitoring of elephants jointly with Nepal<br>5) Radio-collaring of elephants to understand habitat use and migratory routes |
| **Curremt status of the corridor** | Active. Intensity of use by elephants stable. |



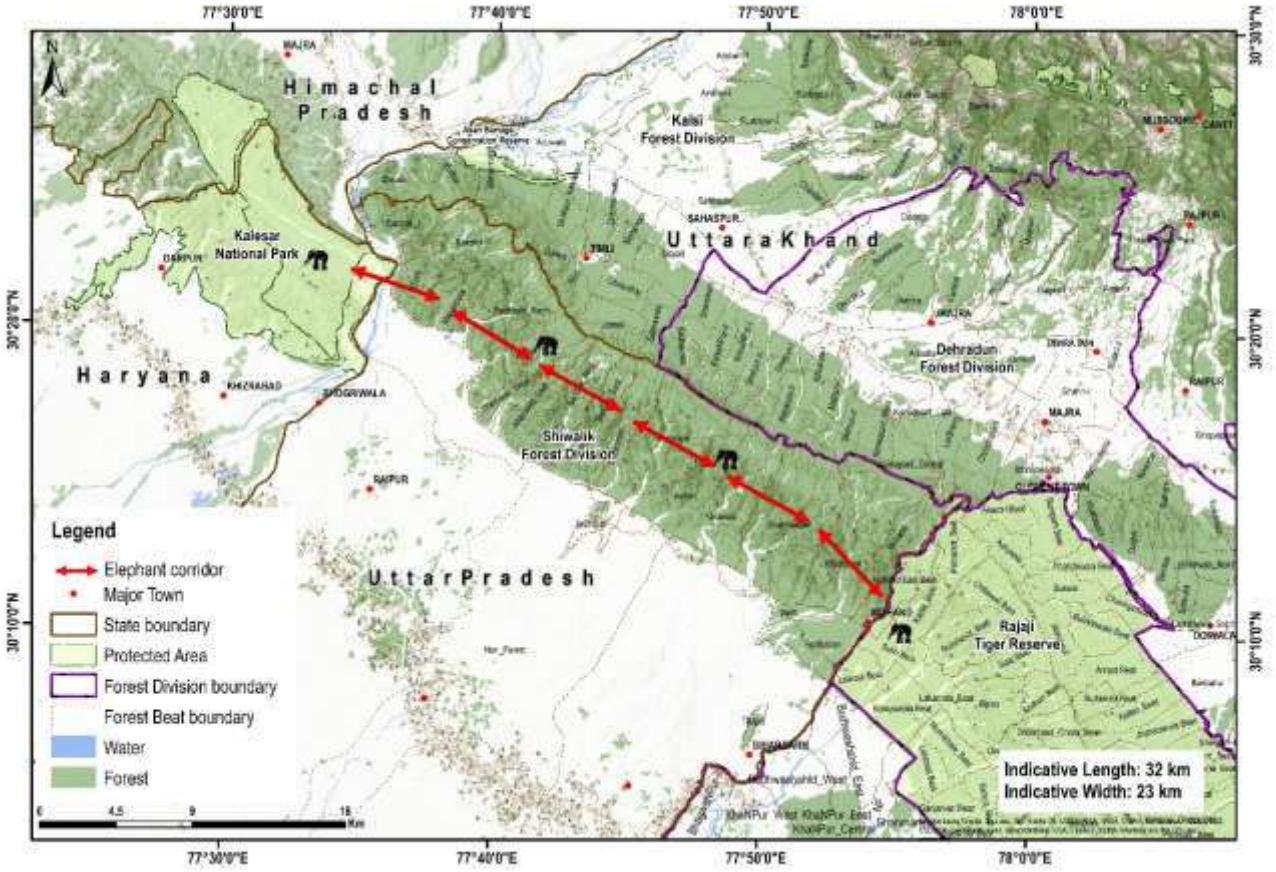
## 7. Rawasan- Sonanadi (Rajaji - Corbett) Corridor (interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Sonanadi Wildlife Sanctuary to Rajaji Tiger Reserve through the Bijnor Plantation Forest Division close to Najibabad** |
| **State** | Uttar Pradesh and Uttarakhand |
| **Indicative length and width** | Length = 22 km, Width = 11 km |
| **Geo Coordinates** | 29° 40' 46" - 29° 48' 9" N<br>78° 19' 31" - 78° 31' 38" E |
| **Forest ranges falling within corridor** | Bahrhapur, Kauraya, Sahanpur and Rajgarh Ranges |
| **Revenue villages falling within corridor** | 5 villages and 12 settelements |
| **Ecological importance** | This is an important corridor used by elephants and tigers moving between Corbett and Rajaji Tiger Reserves. |
| **Habitat type** | Tropical dry deciduous forest and forest plantations. |
| **Major land use** | Forests, settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 103 |
| **Major bottleneck** | 1) Farm lands and settlements along the Najibabad – Kotdwar road (NH-119) and railway line<br>2) Bounder mining in the Malain river<br>3) Numerous settlements of Van Gujjars |
| **Linear infrastructure in the corridor** | 1) Meerut- Pauri National highway- 119 with heavy traffic<br>2) Broad gauge, single track and electrified railway line - 10 km |
| **Recommendations by the forest department to improve the corridor** | 1) Elevated bridge for Meerut- Pauri Highway<br>2) Reduced train speed in Najibabad- Kotdwar section<br>3) Demarcation of the forest boundary and increasing the Protected area on Terai Arc Landscape<br>4) Purchasing of specific tracts of land in Shankurpur Farm area<br>5) Reducing the forest dependency of Gujjars. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



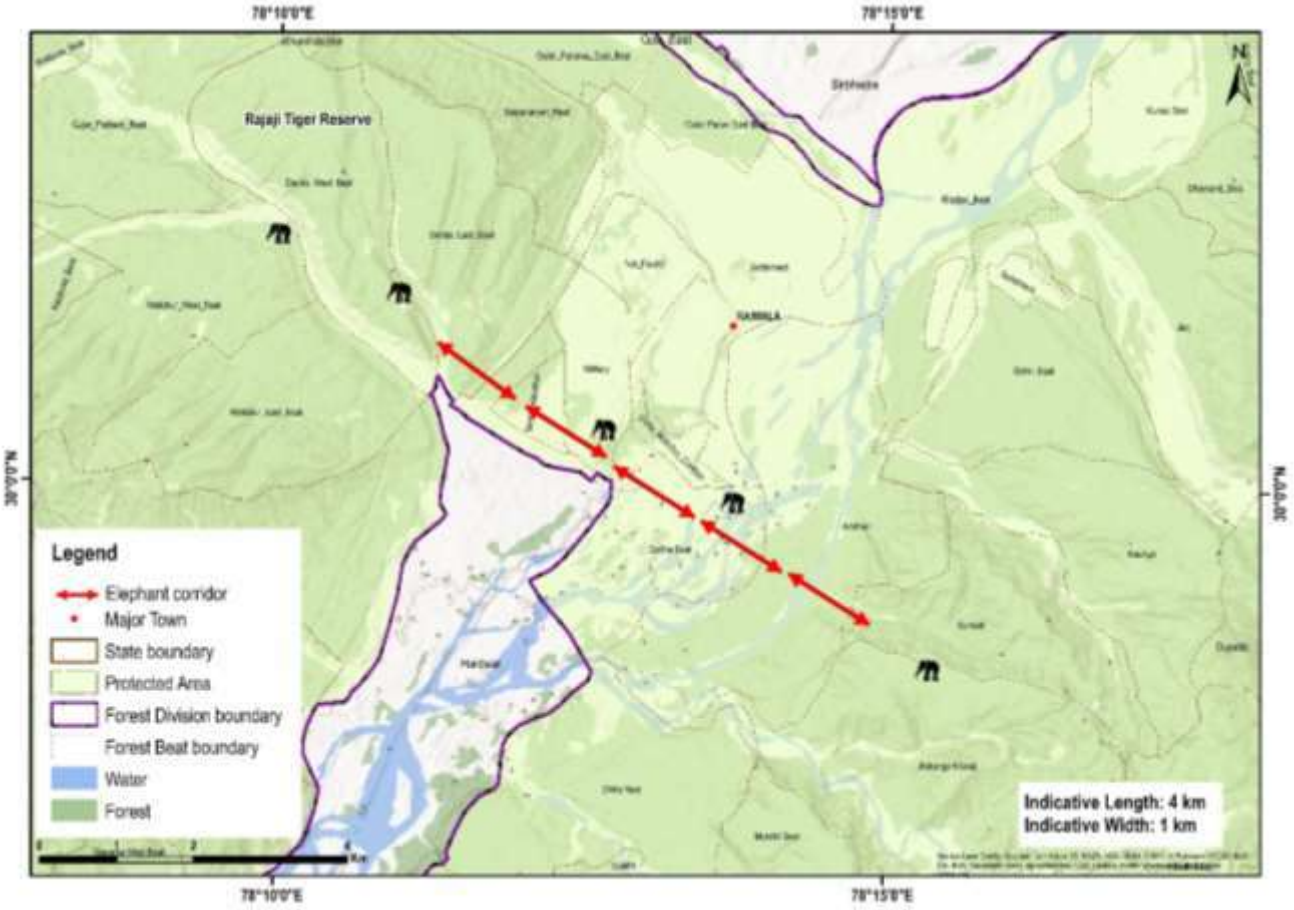
## 8. Shivalik Corridor (interstate)

| | |
|---|---|
| **Connectivity** | **This corridor connects Rajaji Tiger Reserve to Mohand Range to Shakumbri Range to Barkala Range to Kalesar National Park** |
| **State** | Uttar Pradesh and Uttarakhand |
| **Indicative length and width** | Length = 32 km, width = 23 km |
| **Geo Coordinates** | 30° 0', 30° 25' N<br>77° 32', 78° 1' E |
| **Forest ranges falling within corridor** | Mohand, Shakumbri and Barkala Ranges |
| **Revenue villages falling within corridor** | 19 |
| **Ecological importance** | It is one of the major stretches connecting Rajaji NP and Kalesar NP. |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Forests and settlements<br>Forest = 33229.46 ha |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | 18 |
| **Major bottleneck** | National Highway- 72A (307), Heavy human pressure (by Gujjars) |
| **Linear infrastructure in the corridor** | 1) National Highway- 72A (307), 18 km<br>2) Irrigation and power (Eastern Yamuna Canal) - 6 km<br>3) 400 Kv Dehradun- Abdullapurl transmission line in Barkala Range and<br>400 Kv Dehradun- Baghpat transmission line in Mohand Range |
| **Recommendations by the forest department to improve the corridor** | 1) Elevated bridges along canals.<br>2) Relocation of Gujjars from the corridor area & reducing their dependency on forests.<br>3) Water holes and habitat improvement work is needed inside the corridor.<br>4) Eradication of Lantana and other invasive plants.<br>5) Increase in the number of forest staff and watch towers. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



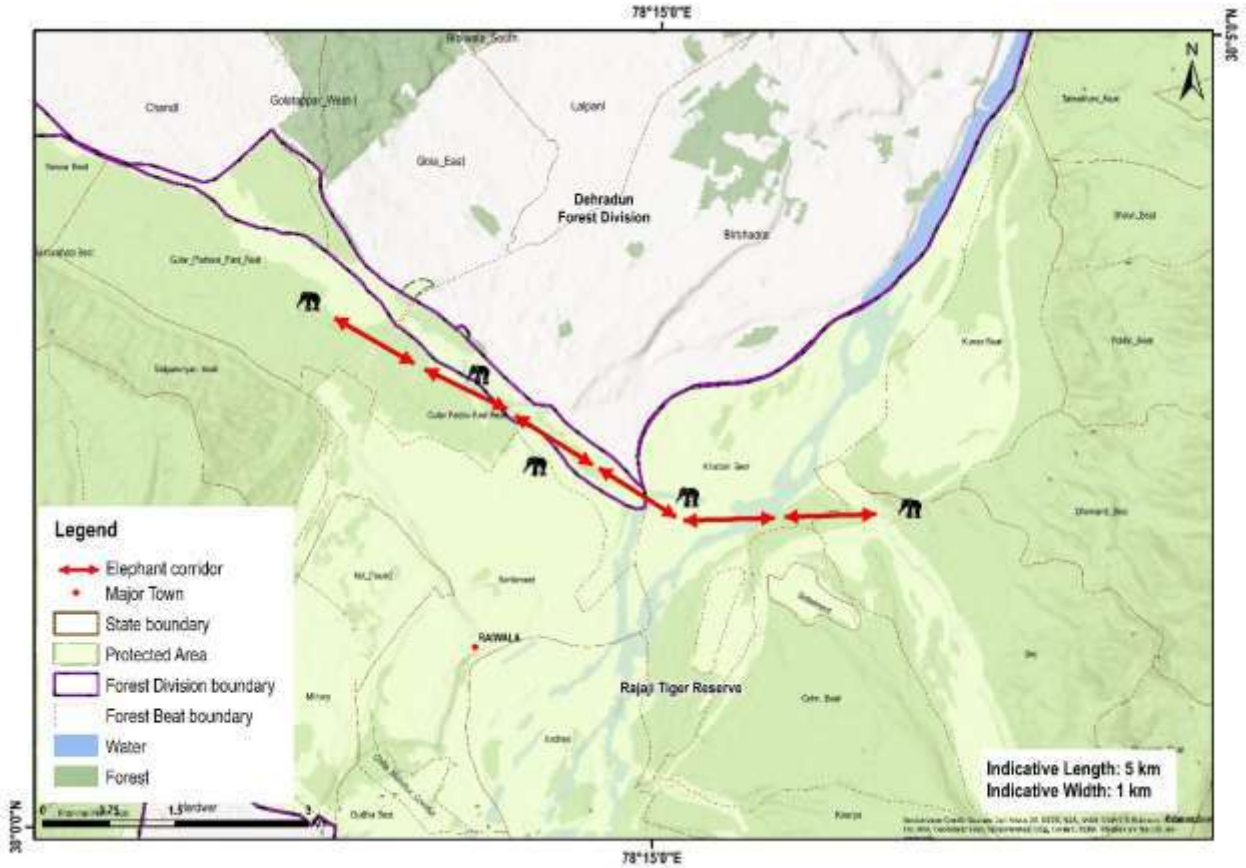
## 9. Chilla- Motichur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Motichur Range with Chilla Range of Rajaji Tiger Reserve across river Ganga through the Motichur river and strip of forests around the river.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 4 km, width = 1 km |
| **Geo Coordinates** | 30$^0$01'12.8'', 78$^0$12'8.1''<br>30$^0$00'33.9'', 78$^0$11'30.6''<br>30$^0$00'18.2'', 78$^0$13'14.2''<br>30$^0$00'00.2'', 78$^0$12'38.2'' |
| **Forest ranges falling within corridor** | Motichur and Chilla Ranges |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | This is a very critical corridor that connects the western Rajaji with eastern Rajaji across river Ganga. The corridor is used by elephants, tigers and other wildlife. |
| **Habitat type** | Tropical dry deciduous sal forest and teak plantation |
| **Major land use** | Forests and Settlements |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Khand gaon, Army ammunition dump, settlement area |
| **Linear infrastructure in the corridor** | 1) National Highway 34<br>2) 2 km of Haridwar-Raiwala Railway track<br>3) Canal powerhouse canal in Chilla Range<br>4) HT power lines, 220 KV & length approx. 500 M, 132 KV, length approx.500 M. |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



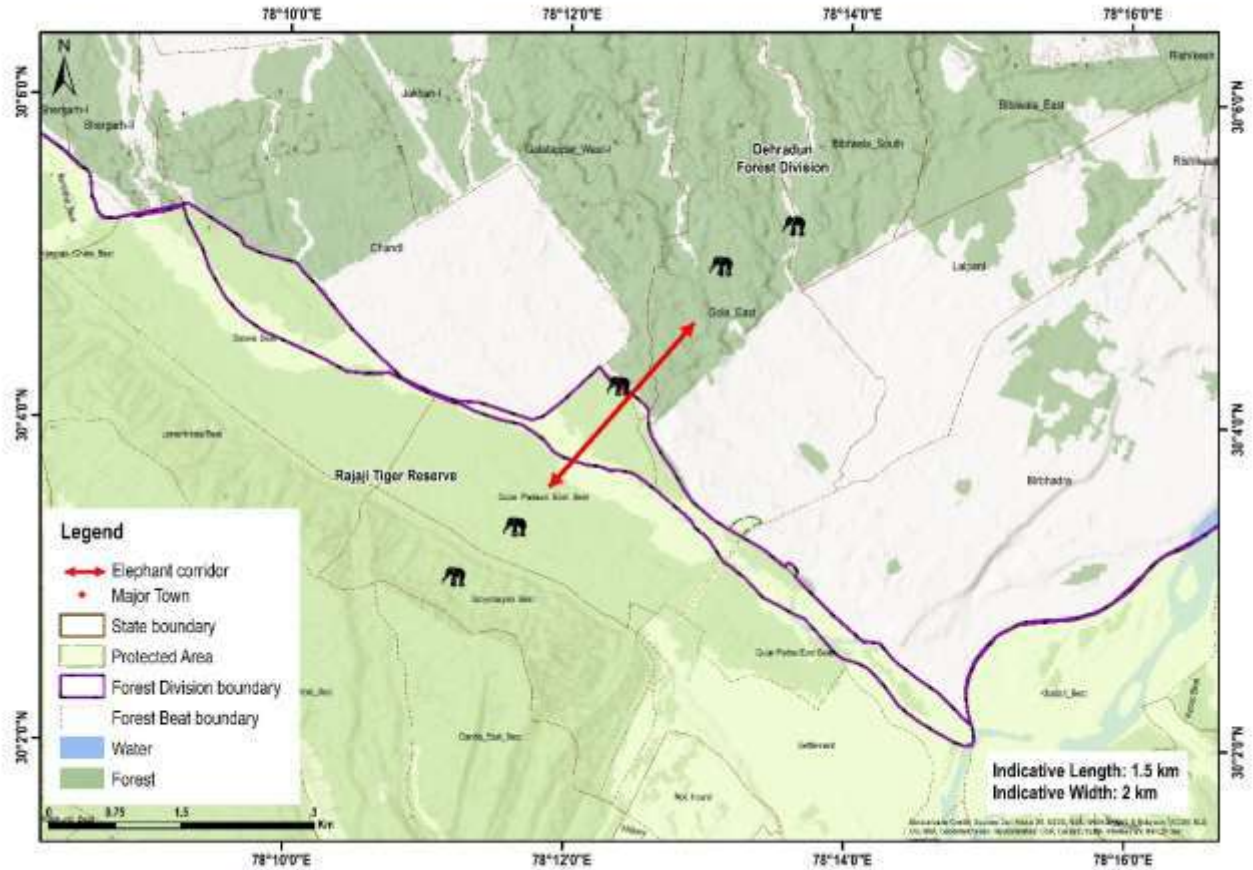
## 10. Motichur - Gohri Corridor

| Connectivity | This corridor connects the Motichur and Gohri Ranges of Rajaji Tiger Reserve across river Ganga and along the River Song. |
|---|---|
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 5 km, width = 1 km |
| **Geo Coordinates** | 30$^0$03'11,42'', 78$^0$13' 8.57''<br>30$^0$03' 8.65'', 78$^0$13' 5.68''<br>30$^0$03' 3.60'', 78$^0$13' 1.42'' |
| **Forest ranges falling within corridor** | Motichur and Gohri Ranges |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | This is a very important corridor that connects the Gohri range and Motichur ranges of Rajaji Tiger Reserve across river Ganga and through the river Song. |
| **Habitat type** | Tropical dry deciduous sal forest and teak plantation |
| **Major land use** | Song River, plantations and forest |
| **Elephant movement status** | Seasonal |
| **Major bottleneck** | Gaurimafi, Thakurpur, settlement area |
| **Linear infrastructure in the corridor** | 1) National Highway 34<br>2) 500m of Raiwala - Rishikesh Railway track |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



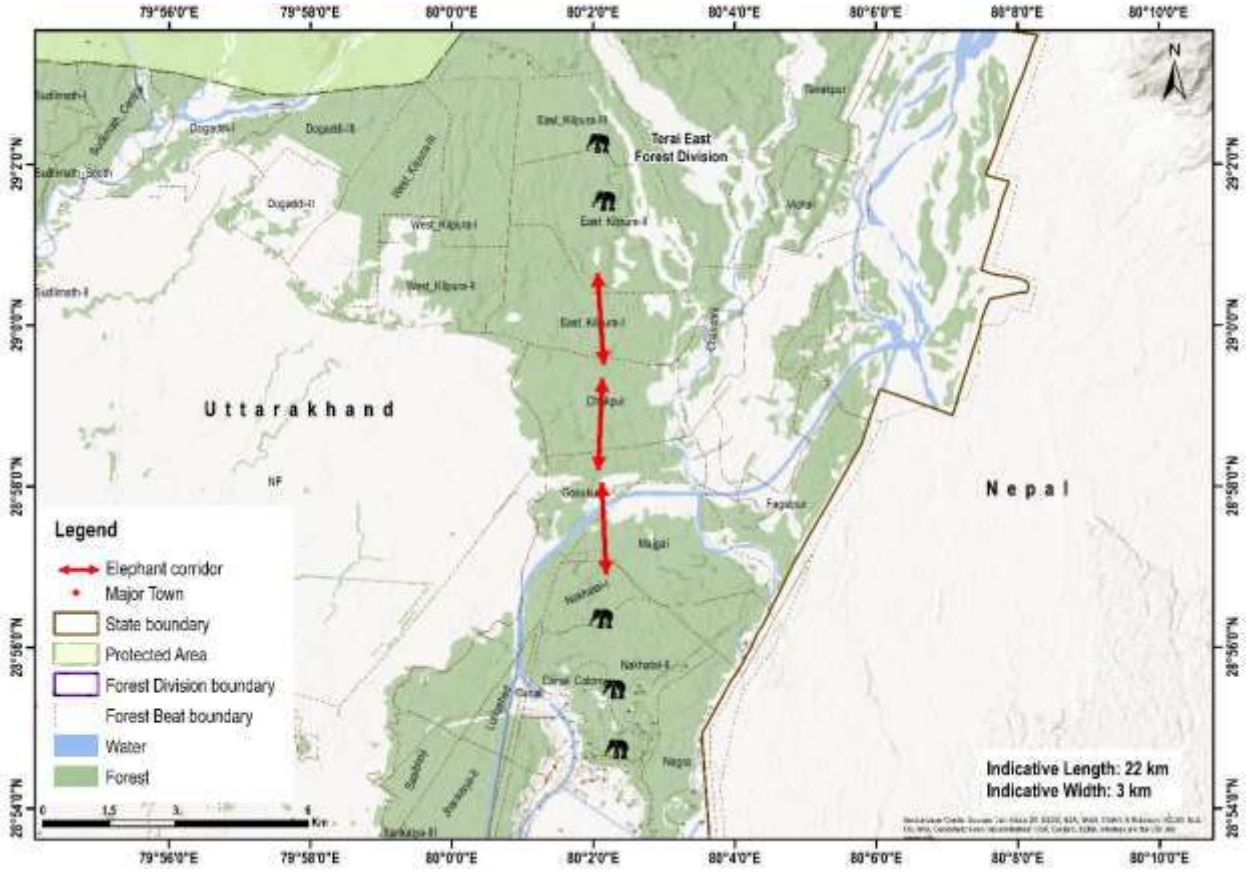
## 11. Teenpani Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Motichur Range of Rajaji Tiger Reserve with the Barkot and Rishikesh Ranges of Dehradun Forest Division.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 1.5 km, width = 2 km |
| **Geo Coordinates** | 30°04'13.14'', 78°12'18.52''<br>30°04'50'', 78°12'24.55''<br>30°04'16'', 78°12'29.95'' |
| **Forest ranges falling within corridor** | Motichur, Barkot and Rishikesh Ranges |
| **Revenue villages falling within corridor** | 2 |
| **Habitat type** | Sal-dominated tropical dry deciduous forest and teak plantation |
| **Major land use** | Forests, Agricultural land, River and Settlements |
| **Elephant movement status** | Seasonal |
| **Major bottleneck** | Sahabnagar, Chidderwala settlement area |
| **Linear infrastructure in the corridor** | 1) 700m of National Highway 7<br>2) 400m of irrigation canal<br>3) 500m of 220 kv high-tension power line<br>4) 300m of electric fencing |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



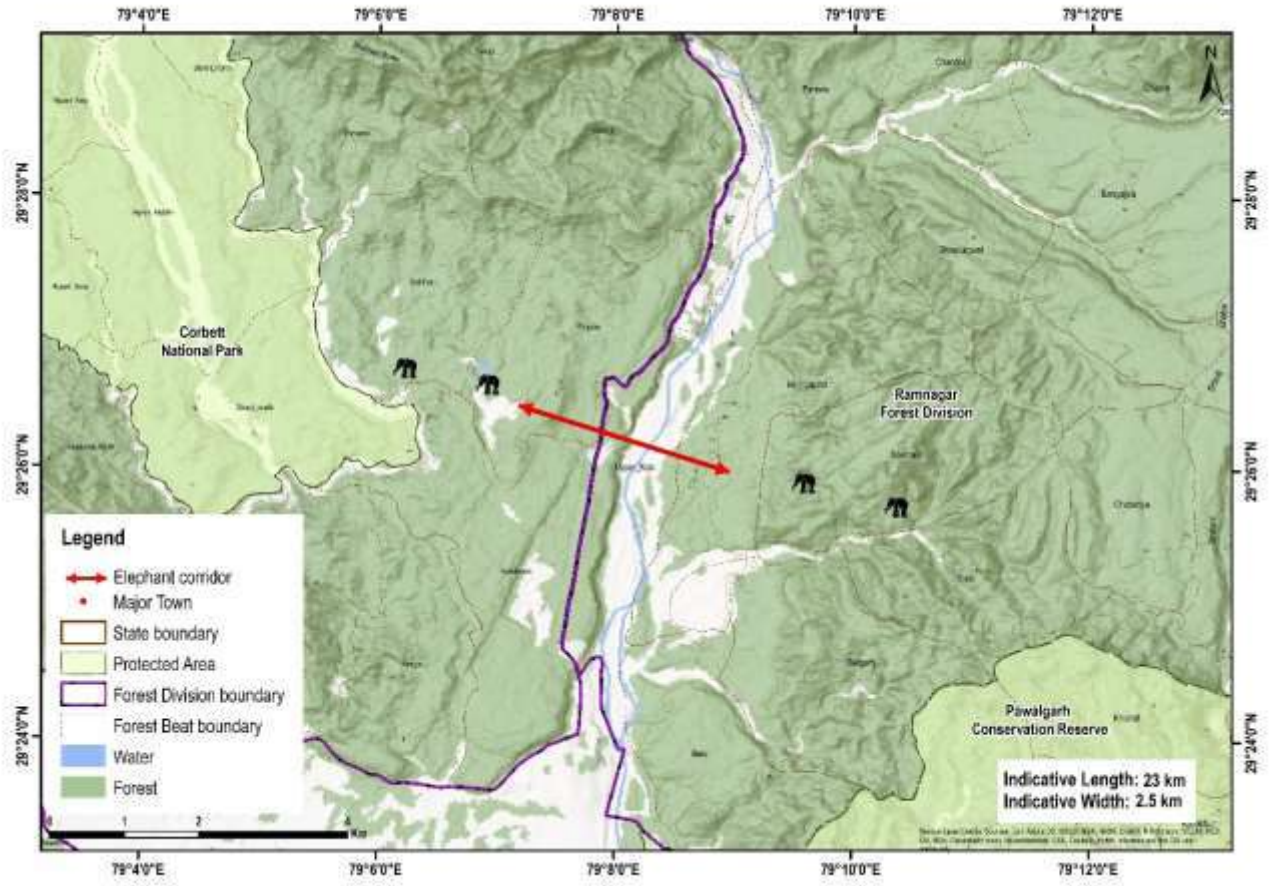
## 12. Kilpura-Khatima-Surai Corridor (interstate and transnational corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Haldwani Forest Division and Nandhaur Wildlife Sanctuary of Uttarakhand with Pilibhit Tiger Reserve of Uttar Pradesh and Shuklaphanta National Park of Nepal** |
| **State** | Uttarakhand and Uttar Pradesh. Also into Nepal |
| **Indicative length and width** | Length = 22 km, Width = 3 km |
| **Geo Coordinates** | $29^0$ 05 17.6, $80^0$ 01 09.6<br>$28^0$ 42 41.9, $79^0$ 57 05.6<br>$28^0$ 46 43.9, $80^0$ 03 10.4<br>$28^0$ 49 31.4, $79^0$ 55 09.7 |
| **Forest ranges falling within corridor** | Kilpura, Khatima, Surai and Sarada Ranges. |
| **Revenue villages falling within corridor** | 13 |
| **Ecological importance** | Only connectivity between Nandhaur WLS and Pilibhit TR. |
| **Habitat type** | Moist deciduous forest |
| **Major land use** | Forest, Agricultural land and Settements |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Chakarpur-Jagbura River, Lalkothi bridge-Lohia head |
| **Linear infrastructure in the corridor** | 1) National Highway 125, 3.5 km<br>2) Broad gauge and electrified railway line, 4 km<br>3) Sharda Canal with gentle earthen slope, 15 km<br>4) Solar fence, 3 km |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



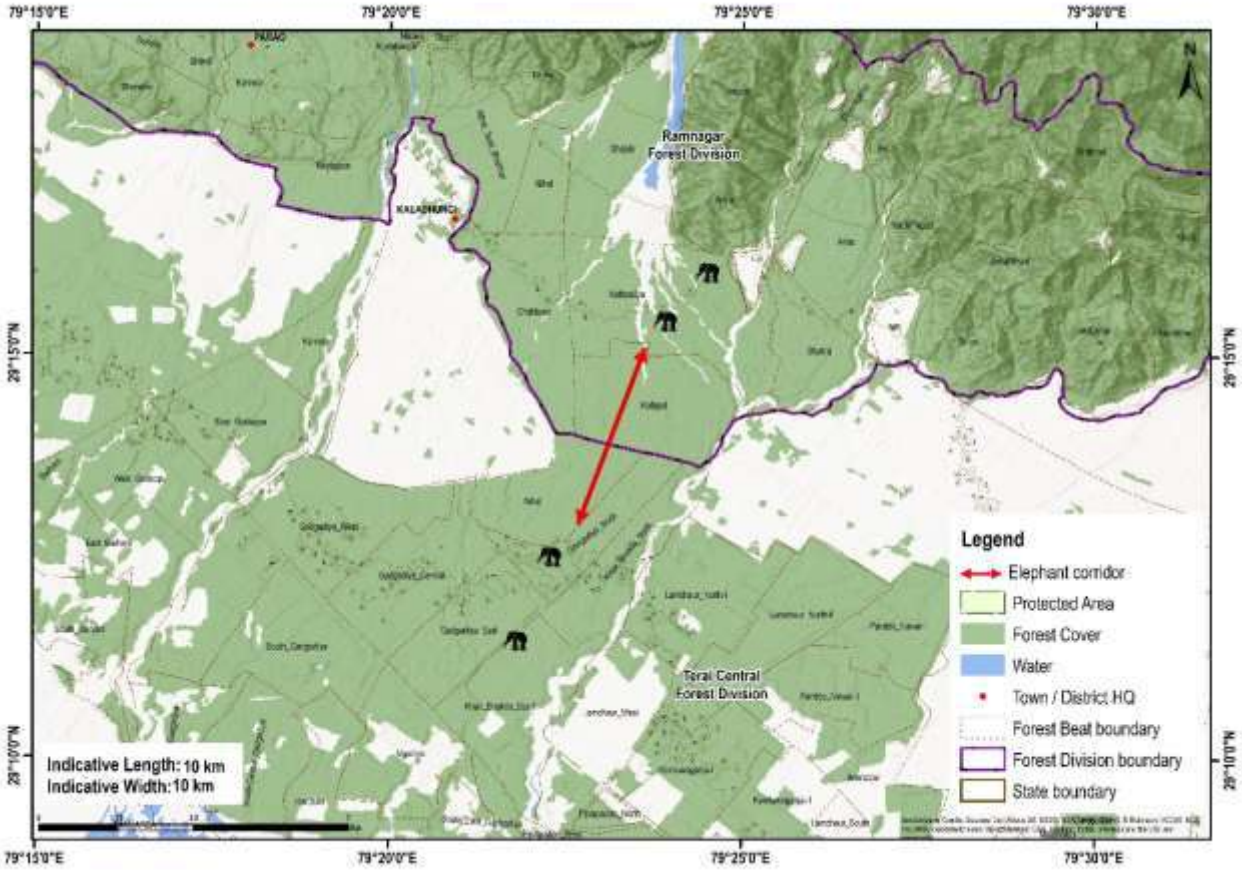
## 13. Kosi River Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Corbett Tiger Reserve to Ramnagar Forest Department across River Kosi in multiple locations.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 23 km, width = 2.5 km |
| **Geo Coordinates** | 29° 25' 15"-29° 27' 8" N<br>79° 7' 18"-79° 9' 4" E |
| **Forest ranges falling within corridor** | Bijrani (Corbett TR) and Kosi (Ramnagar) Ranges |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | Connectivity between Corbett TR and Ramnagar FD |
| **Habitat type** | Sal dominated Tropical dry deciduous forest |
| **Major land use** | Forest, Riverbed, human settlements, IMPCL (Indian Medicines Pharmaceutical Corporation Limited) |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Ladua chaur to Garjia chowki, Garjia temple to Sunderkhal, Dhangadi to Mohaan |
| **Linear infrastructure in the corridor** | 1) 23 km of National Highway 121<br>2) High-tension power line near ladua chaur<br>3) IMPCL industry |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



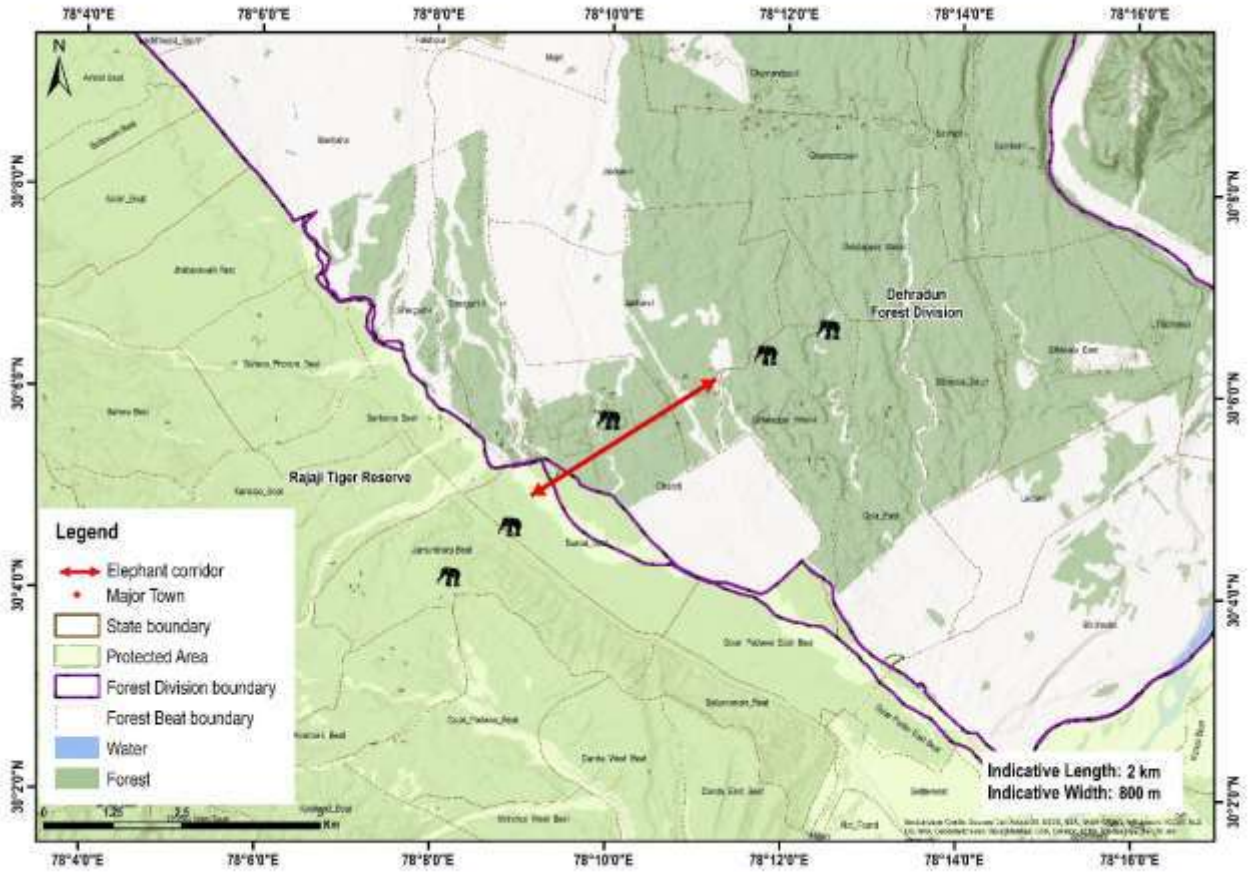
## 14. Nihal- Bhakra (Fatehpur- Gadgadia) Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Fatehpur Range of Ramnagar Forest Division with the Gadgadia Range of Terai Central Forest Division.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 10 km, width = 10 km |
| **Geo Coordinates** | 29° 13' 1"-29° 15' 0" N<br>79° 21' 36"-79° 25' 0" E |
| **Forest ranges falling within corridor** | Fatehpur and Gadgadia Ranges |
| **Revenue villages falling within corridor** | 4 |
| **Ecological importance** | Used to be connectivity for Terai East FD via Terai Central FD |
| **Habitat type** | Tropical moist deciduous |
| **Major land use** | Forests and settlements |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Kaladhungi-Haldwani highway |
| **Linear infrastructure in the corridor** | 5 km of Kaladhungi-Haldwani highway |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



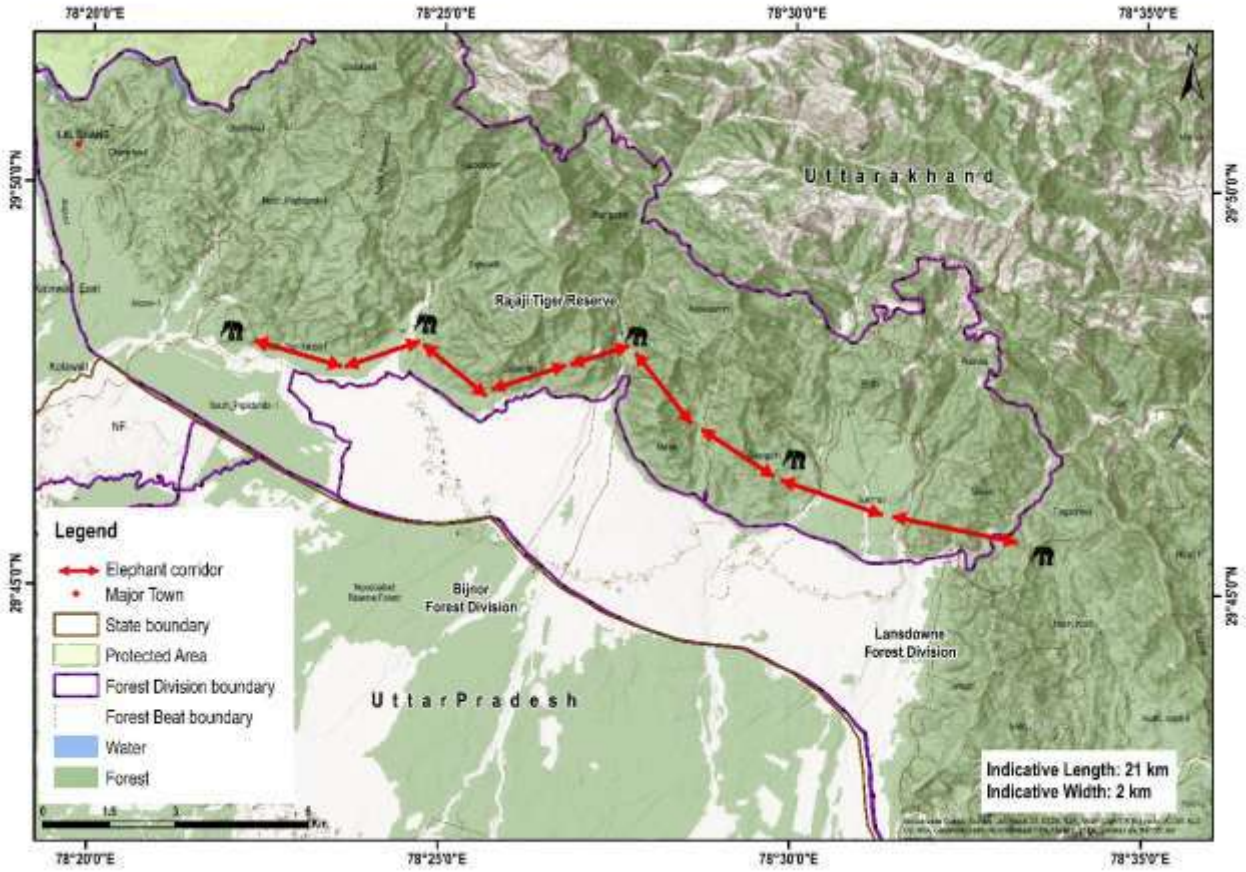
## 15. Kansrau - Barkot Corridor (Lal Tappar corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Kansrau Range of Rajaji Tiger Reserve and the Barkot and Rishikesh Ranges of Dehradun Forest Division** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 2 km, width = 800 m |
| **Geo Coordinates** | 30⁰04'55.0" 78⁰09'00"<br>30⁰04'48.0" 78⁰09'11.0"<br>30⁰05'50.0" 78⁰10'47.0"<br>30⁰05'57.0" 78⁰10'42.0" |
| **Forest ranges falling within corridor** | Kansrau (Rajaji TR), Barkot and Rishikesh Ranges (Dehradun FD) |
| **Revenue villages falling within corridor** | Information NA |
| **Ecological importance** | It is an important corridor that connects the elephant populations of Rajaji Tiger Reserve with Dehradun Forest Division. |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forests and Settlements |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Near Lal Tappar Industrial Area |
| **Linear infrastructure in the corridor** | 1) National Highway 7<br>2) High-tension power line (132 KV) |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



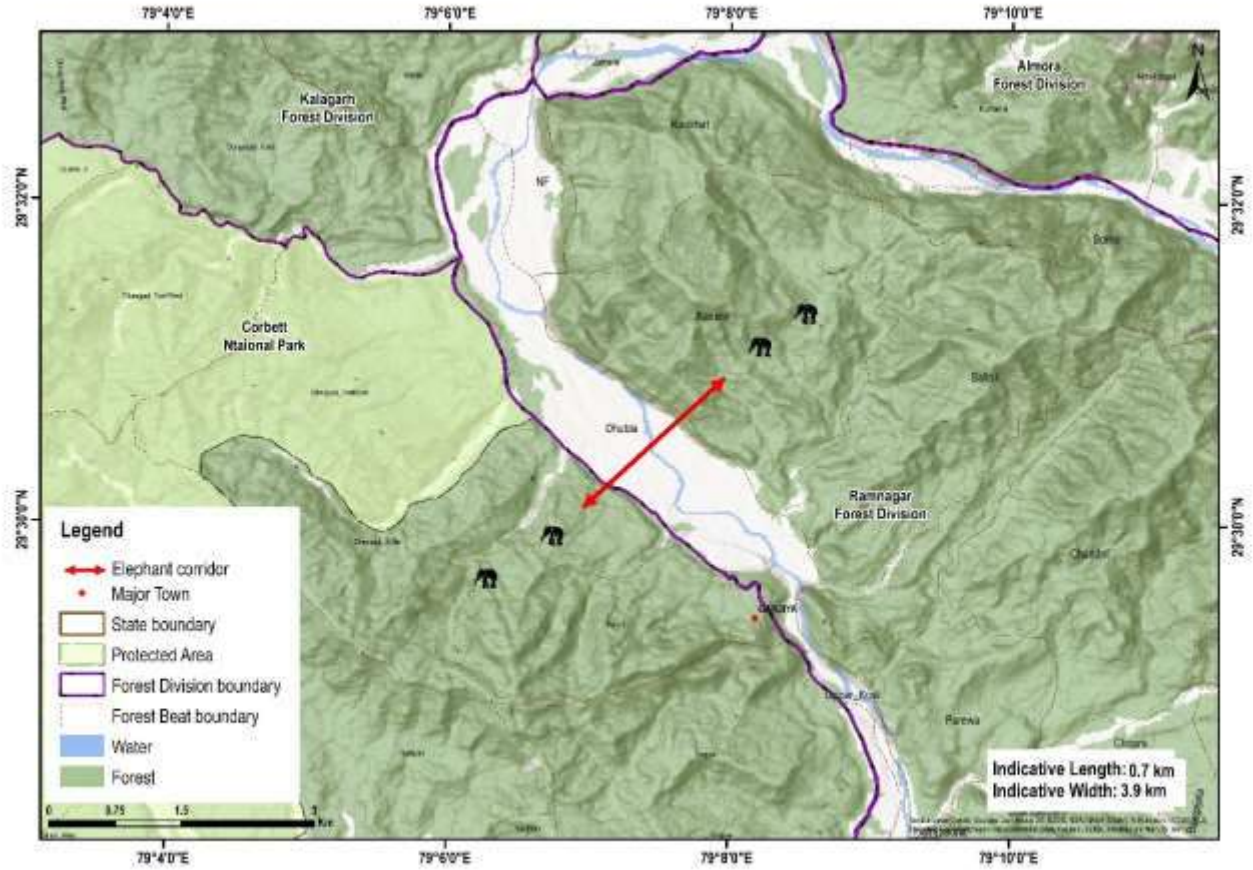
## 16. Rawasan-Sonanadi (Via Lansdowne FD) Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Rajaji and Corbett Tiger Reserves. Elephants use the foothills between Rawasan (at the eastern end of Rajaji Tiger Reserve) and the Khoh River (western end of Corbett Tiger Reserve).** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 21 km, width = 2 km |
| **Geo Coordinates** | 29° 45' 25", 29° 48' 32" N<br>78° 22' 46", 78° 33' 27" E |
| **Forest ranges falling within corridor** | Najibabad Reserve Forest |
| **Revenue villages falling within corridor** | 35 |
| **Ecological importance** | This is a very crucial corridor that connects the elephant and tiger populations between Corbett and Rajaji Tiger Reserves. |
| **Habitat type** | Tropical dry deciduous and riparian forests |
| **Major land use** | Forest |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Not provided by forest department |
| **Linear infrastructure in the corridor** | 1) National Highway 119, and associated high traffic |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



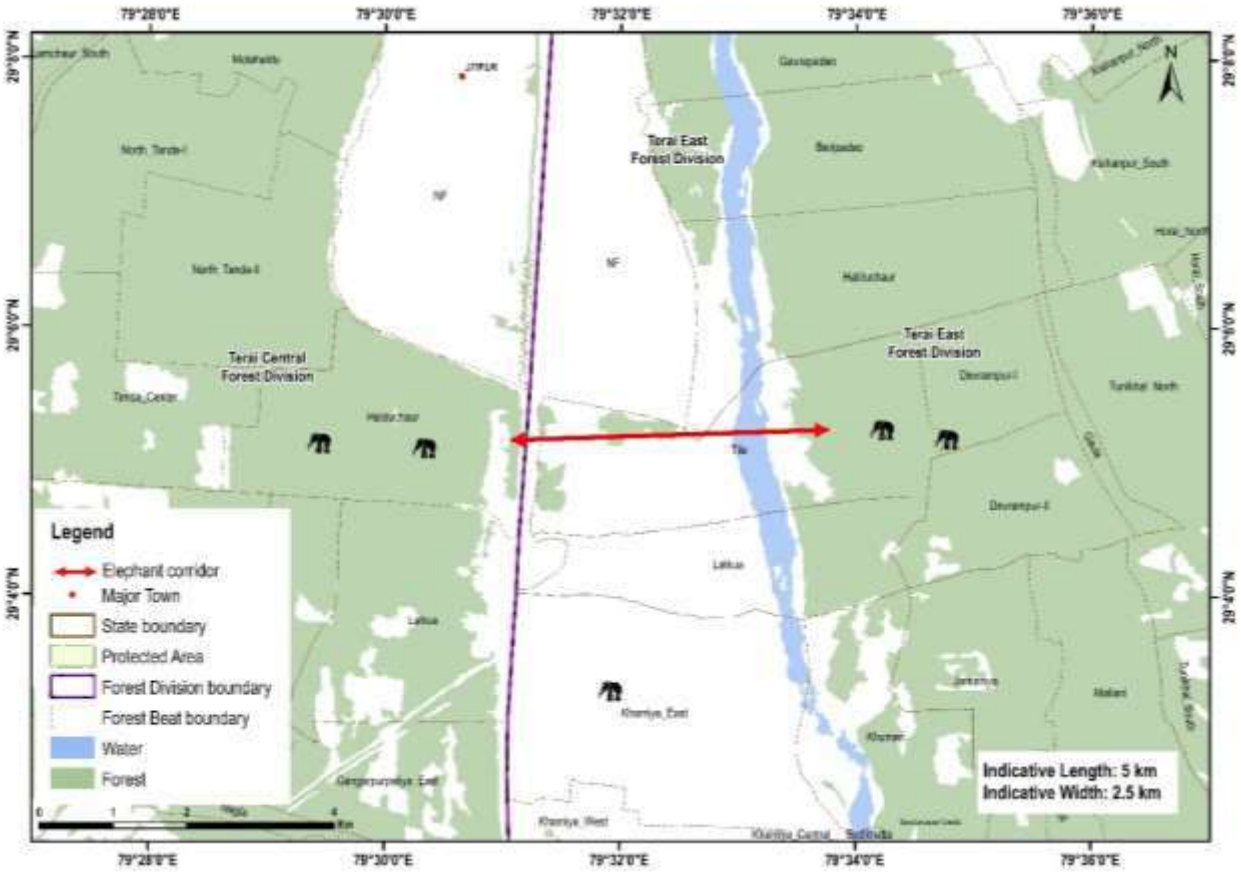
## 17. Chilkiya- Kota Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Chilkiya Reserve Forest of Corbett Tiger Reserve and Kota RF of Ramnagar Division.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 0.7 km, width = 3.9 km |
| **Geo Coordinates** | 29° 29' 36", 29° 31' 30" N<br>79° 5' 58", 79° 8' 37" E |
| **Forest ranges falling within corridor** | Sarpduli, and Kosi Range |
| **Revenue villages falling within corridor** | 35 |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forests , Agricultural land and Settlements |
| **Elephant movement status** | Regular |
| **Major bottleneck** | Information NA |
| **Linear infrastructure in the corridor** | 1) National Highway 121, and associated high traffic<br>2) A high-tension line passes through the Kosi Range<br>3) Garjiya temple |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants not available. |



## 19. Gola Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Gola Rankhu and Gorai Reserve Forest of Terai East Forest Division and the Tanda Protected Forest of Terai Central Forest Division.** |
| **State** | Uttarakhand |
| **Indicative length and width** | Length = 5 km, width = 2.5 km |
| **Geo Coordinates** | 29°05'10"– 29°05'37" N<br>79°31'02"– 79°31'04" E |
| **Forest ranges falling within corridor** | Haldwani |
| **Revenue villages falling within corridor** | 8 |
| **Ecological importance** | Important for the population continuity between forests of Gola Rankhu, Gorai and the Tanda Protected Forest. |
| **Habitat type** | Dry deciduous forest |
| **Major land use** | Forest and settlements |
| **Elephant movement status** | No Movement |
| **Major bottleneck** | Haldwani and Lal Kuan towns |
| **Linear infrastructure in the corridor** | 1)Expansion of Haldwani township and setting up of Lal Kuan industrial complex<br>2) Heavy traffic on Haldwani-Lal Kuan road<br>3) Boulder mining in the Gola River area |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Impaired. |

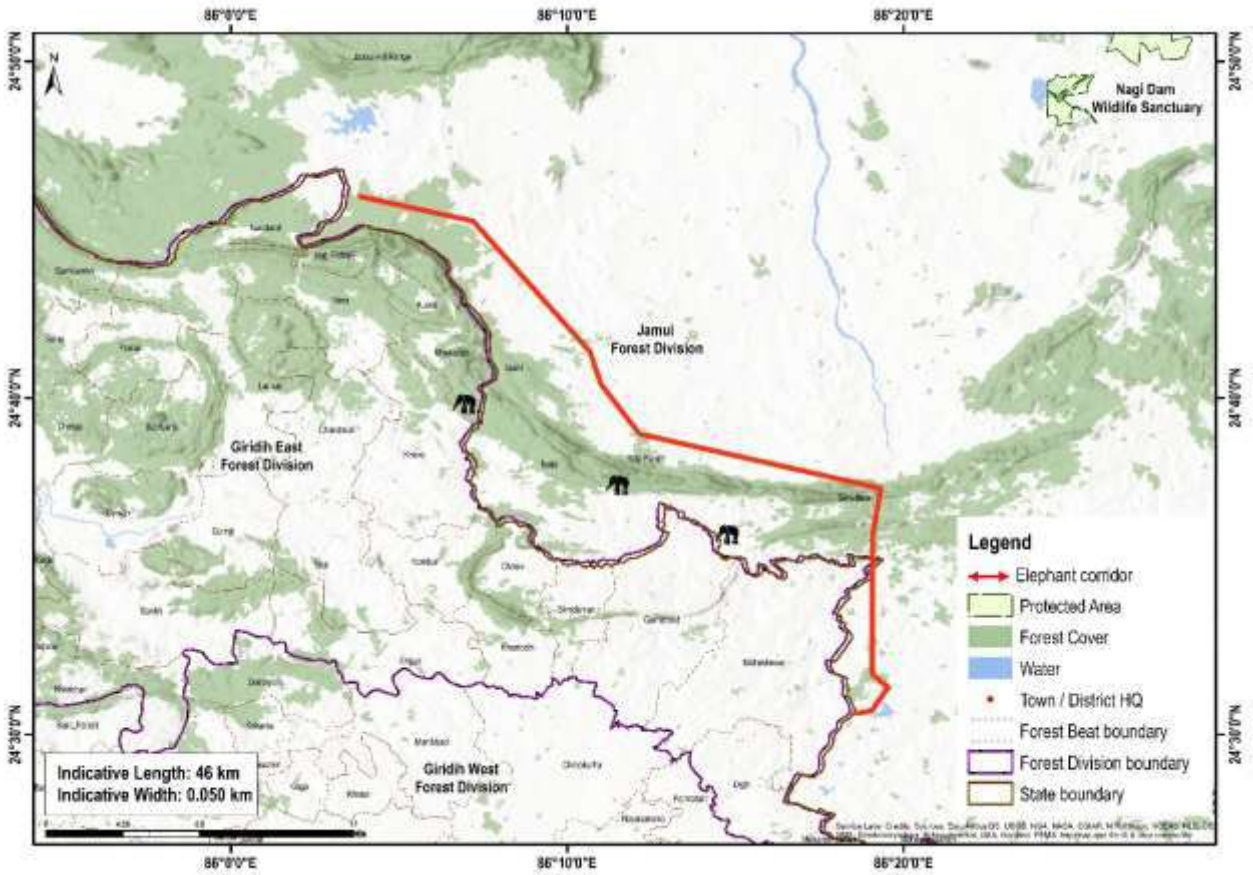


# *Elephant Corridors*

# East Central Region

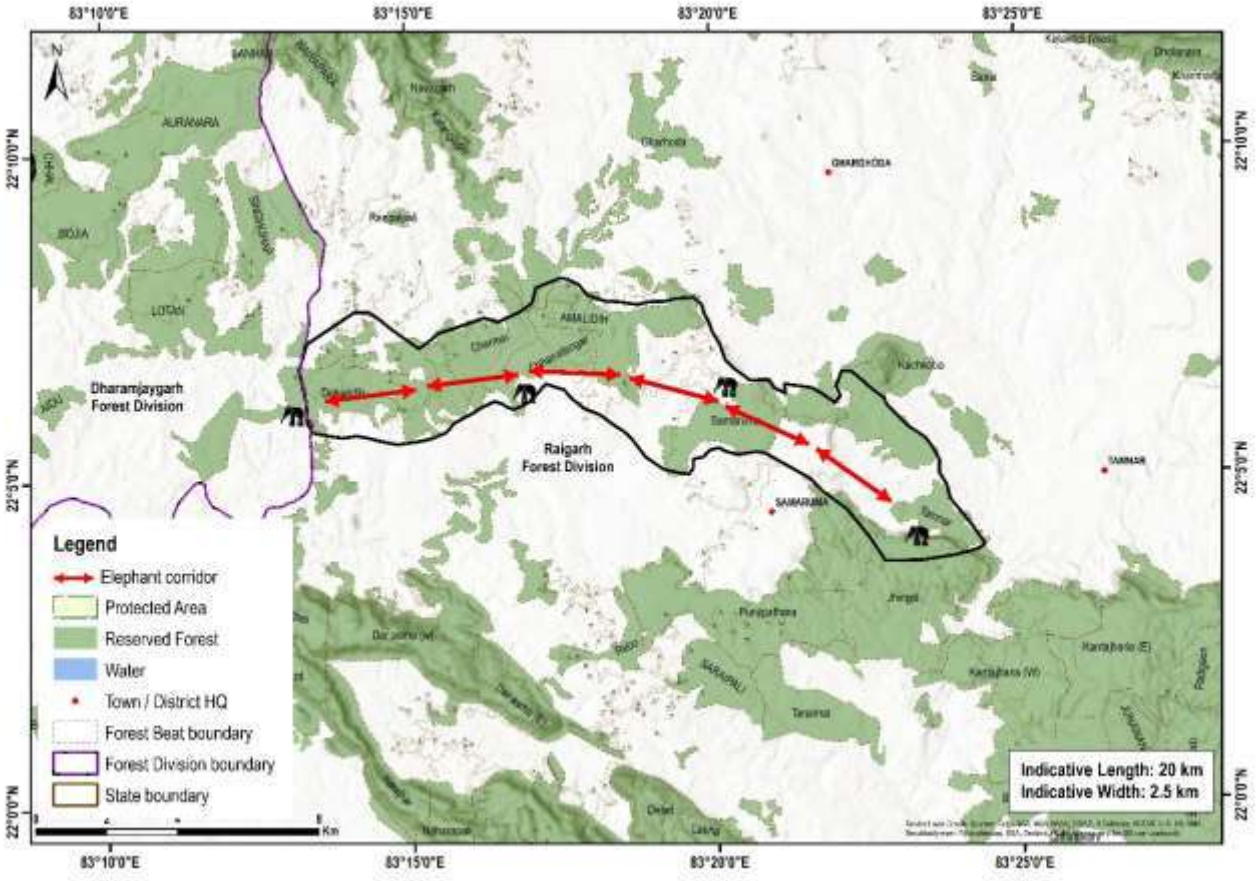
## 1. Jamui- Jhajha- Chakayi Corridor

| | |
|---|---|
| **Connectivity** | **Elephant movement is between the Garhi beat of Jamui range, Charkapatthar and Batia beats of Jhaja range and Madhwa sub-beat of Chakayi range.** |
| **State** | Bihar |
| **Geo coordinates** | 24.747494, 86.126023 to 24.523028, 86.326086 |
| **Indicative length and width** | Length = 46 km, width = 30 - 50 m |
| **Beats falling within corridor** | Garhi, Charkapatthar and Batia Beat, and Madhuwa Sub- Beat |
| **Forest ranges falling within corridor** | Jamui, Jhajha and Chakayi Ranges |
| **Revenue villages falling within corridor** | Three |
| **Habitat type** | Moist deciduous Sal Forests, Tropical deciduous Sal Forests, Dry deciduous mixed Forests, Boswellia Forests, Aegle Forests, Scrub Forests and Euphorbia Forests |
| **Major land use** | Forest = 80 ha<br>Agriculture = 34 ha<br>Habitation = 10 ha |
| **Elephant movement status** | Occasional. |
| **Number of elephants using this corridor** | 9 |
| **Linear infrastructure in the corridor** | Information not provided |
| **Bottlenecks in the corridor** | Near Garhi, Batia and Simultala there are breaks in the corridor. |
| **Recommendations by the forest department** | 1) Data-driven proper identification of corridor is required.<br>2) Habitat management enrichment along the elephant corridor/migration.<br>2) Awareness programs for local people. |
| **Status of the corridor** | Active. Intensity of use by elephants not available |



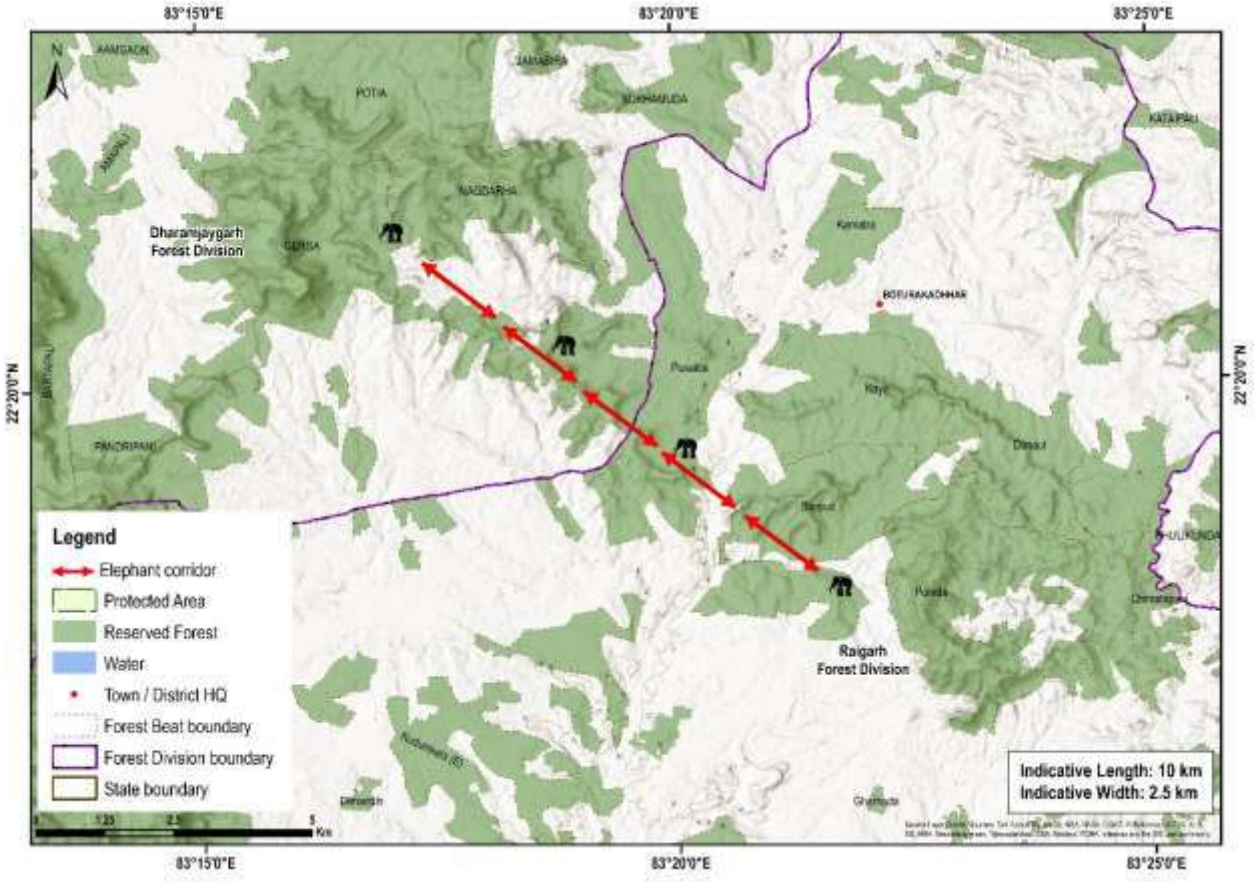
## 2. Charmar – Jingol corridor

| | |
|---|---|
| **Connectivity** | **Connects Dharamjaigarh to Raigarh Forest Division and then on to Odisha towards the east** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 20 km, width = 2.5 km |
| **Geo coordinates** | 22.134361, 83.219990<br>22.061002, 83.406998 |
| **Compartments falling within corridor** | 1264P, 1267, 1263P, 1253P, 1268, 1269, 1252P, 1270, 1273, 1272, 1244P, 1276, 846, 847, 848, 849, 850P, 842P, 838 |
| **Beats falling within corridor** | Dehradihi, Charmar, Chharratangar, Amalidh, Samaruma, Kachkoba, Tamnar |
| **Forest ranges falling within corridor** | Ghargoda and Tamnar |
| **Ecological importance** | Important corridor for elephant moving from Odisha to interiors of Chhattisgarh. |
| **Habitat type** | Tropical Dry Deciduous |
| **Major land use** | Forest, agriculture and settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 80- 100 |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



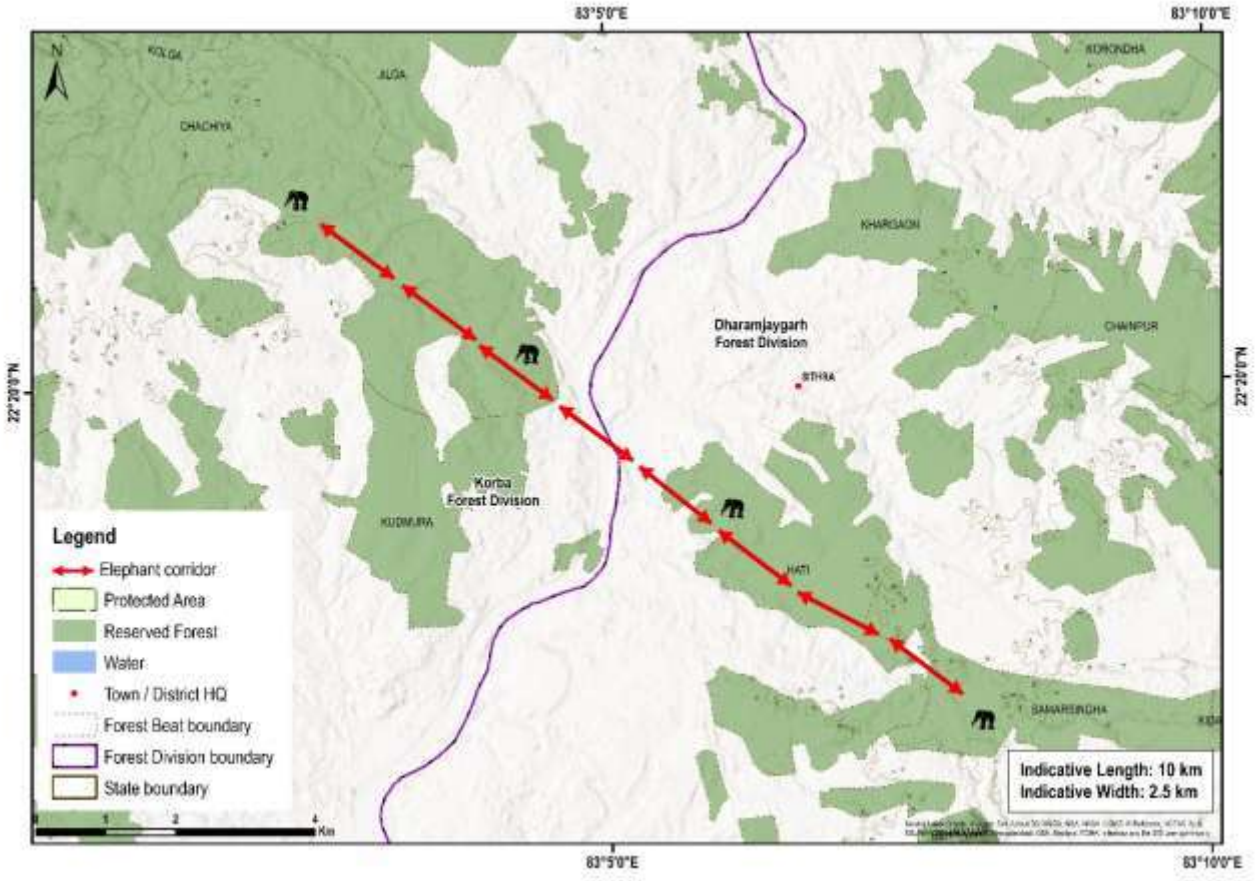
## 3. Nagdhara- Baraud corridor

| Connectivity | Connects habitats in Raigarh and Dharamjaigarh Forest Divisions |
|---|---|
| State | Chhattisgarh |
| Indicative length and width | Length =10 km, width = 2.5 km |
| Geo coordinates | 22.355827 83.283188<br>22.297178 83.364202 |
| Compartments falling within corridor | 1286P, 1287, 1312, 1288OA, 1291P, 1289P, 1293, 1292P, 413, 414 |
| Beats falling within corridor | Nagdhara, Pusalda and Baraud |
| Forest ranges falling within corridor | Ghargoda (Raigarh FD) and Dharamjaigarh (Dharamjaigarh FD) |
| Revenue villages falling within corridor | Information NA |
| Ecological importance | Important corridor that is used by elephants moving from Odisha to interiors of Chhattisgarh. |
| Habitat type | Sal-dominated tropical dry deciduous |
| Major land use | Forest, agriculture and settlements |
| Elephant movement status | Regular |
| No. of elephants using the corridor | 80- 100 |
| Linear infrastructure in the corridor | Information NA |
| Recommendations by the forest department to improve the corridor | Information NA |
| Current status of the corridor | Active. Intensity of use by elephants stable. |



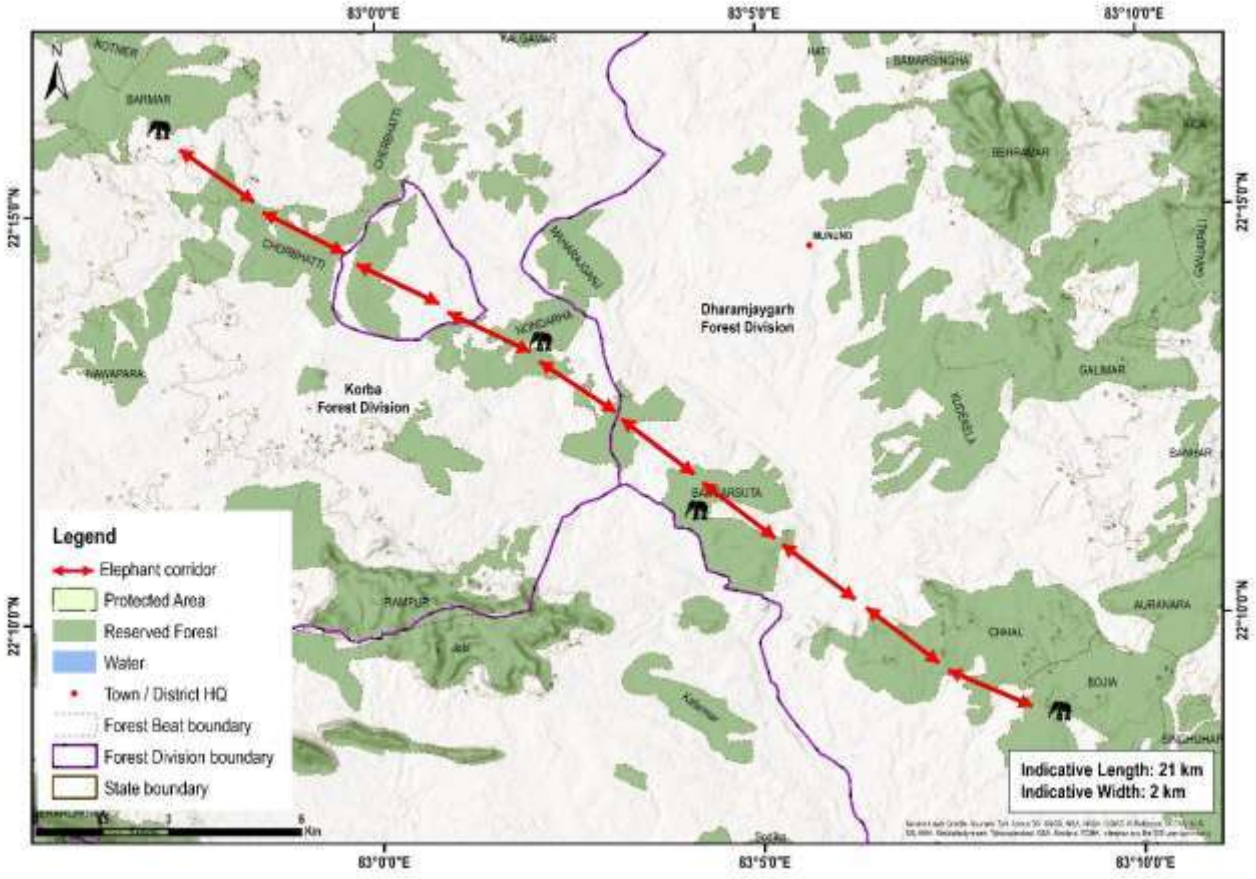
## 4. Hati-Kudmura corridor

| | |
|---|---|
| **Connectivity** | **Korba and Dharamjaigarh FD** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 10 km, width = 3.2 km |
| **Geo coordinates** | 22.35684, 83.04527<br>22.29613, 83.12690 |
| **Compartments falling within corridor** | 555P, 562, 554, OA 1425, OA 1424, P1139, OA 1423 |
| **Beats falling within corridor** | Kudmura (Korba FD), Chachiya (Korba FD), Hati (Dharamjaigarh FD), Samarsingha (Dharamjaigarh FD) |
| **Forest ranges falling within corridor** | Chaal and Kudmura ranges |
| **Ecological importance** | This is the main corridor used by elephants to move between Korba and Dharamjaigarh Forest Divisions across River Maand. |
| **Habitat type** | Sal-dominated tropical dry deciduous forest |
| **Major land use** | Forests, agriculture and settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 80 |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



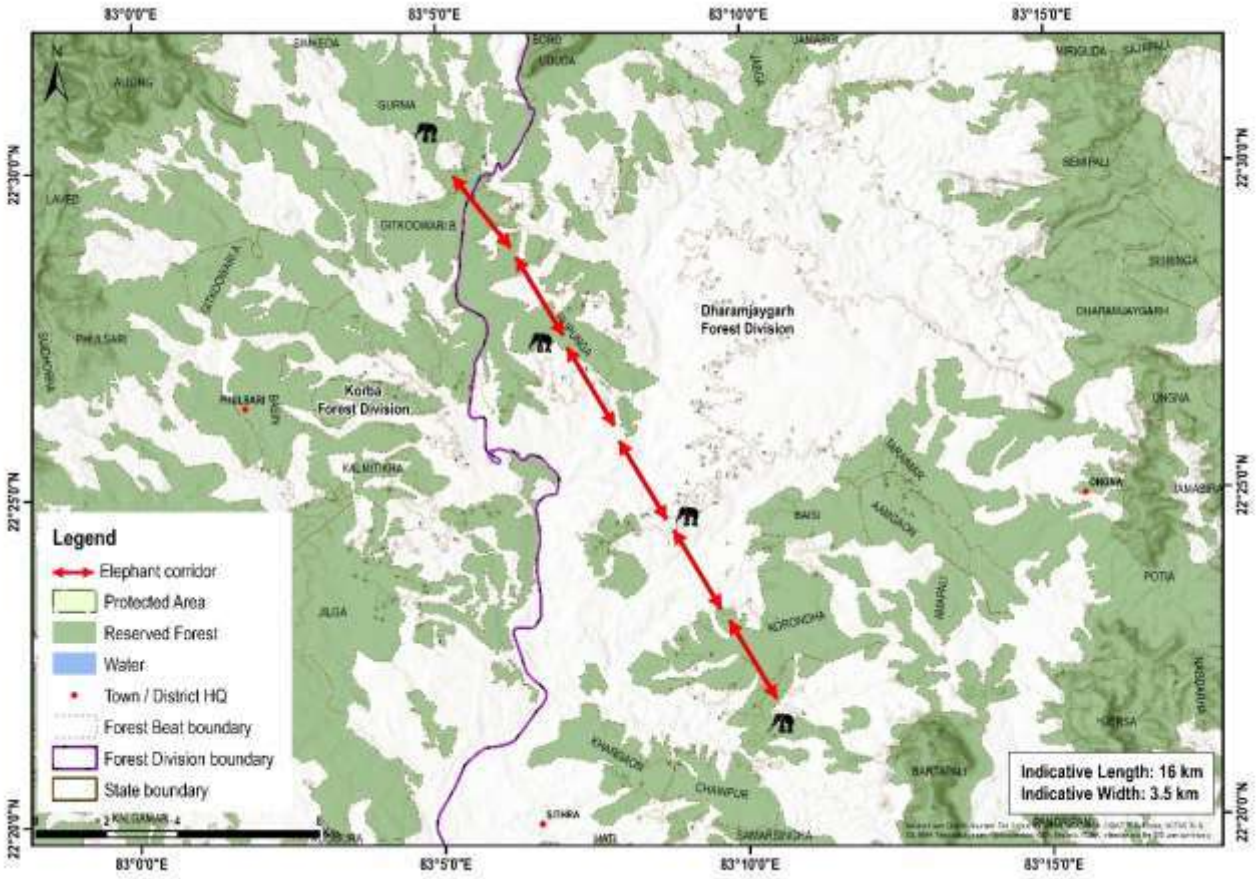
## 5. Chaal- Kartala corridor

| | |
|---|---|
| **Connectivity** | **Korba and Dharamjaigarh FD** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 21 km, width = 2 km |
| **Geo coordinates** | 22.263807, 82.960300<br>22.143325, 83.148465 |
| **Compartments falling within corridor** | 512, 513, 506P, 511, 507P, 510, 509P, 508, 541, 542, 543, P1156, OA 1468, OA 1467, P1154, P1155, P1153, OA 1466, 1180, P1149, OA 1462, P1150 |
| **Beats falling within corridor** | Chaal, Bangarsuta (in Dharamjaigarh FD) and Nondarha, Chaal part, and Chorbhatti (in Korba FD) |
| **Forest ranges falling within corridor** | Chaal and Kartala ranges |
| **Ecological importance** | Some of the peripheral herds (that moves primarily along the boundary areas) in Dharamjaigarh and Korba Forest Division use this corridor by crossing across River Maand |
| **Habitat type** | Tropical Dry Deciduous |
| **Major land use** | Forests, agriculture and settlements |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | Information NA |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



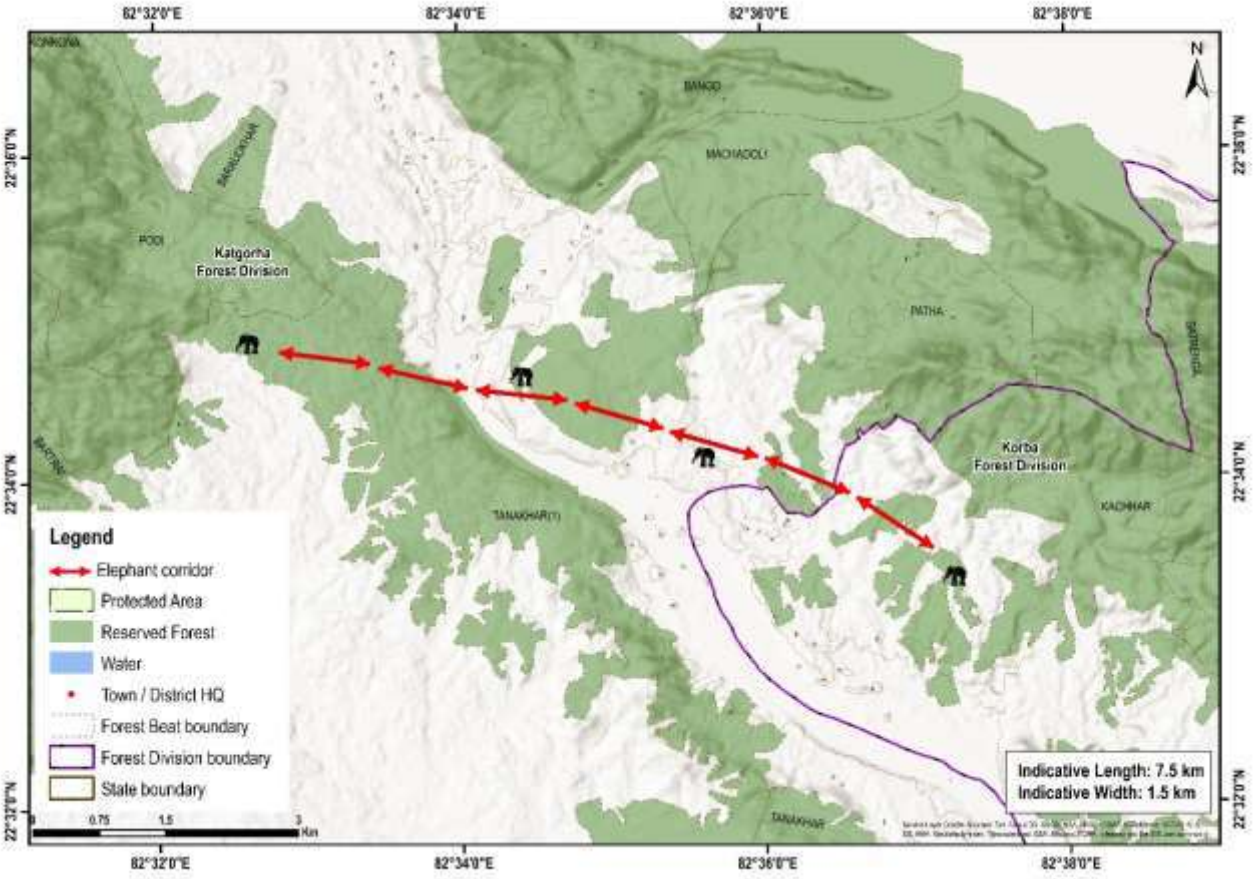
## 6. Korondha - Rupunga corridor

| | |
|---|---|
| **Connectivity** | **Elephant movement with Dharamjaigarh Range, which is disjunct and connected only by this corridor** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 16 km, width = 3.5 km |
| **Geo coordinates** | 22.49530, 83.08785<br>22.36575, 83.19266 |
| **Compartments falling within corridor** | 450, 377, 452, 454, 453P, 451P, 476P, 455P, 456P, 457P, 458P, 461P, 462P, 463, 464P, 460P |
| **Beats falling within corridor** | Korondha and Rupunga |
| **Forest ranges falling within corridor** | Dharamjaigarh |
| **Ecological importance** | This corridor is frequently used by elephants, but the connectivity can be broken by ongoing infrastructure development. |
| **Habitat type** | Sal-dominated tropical dry deciduous forests |
| **Major land use** | Forests, agriculture and settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



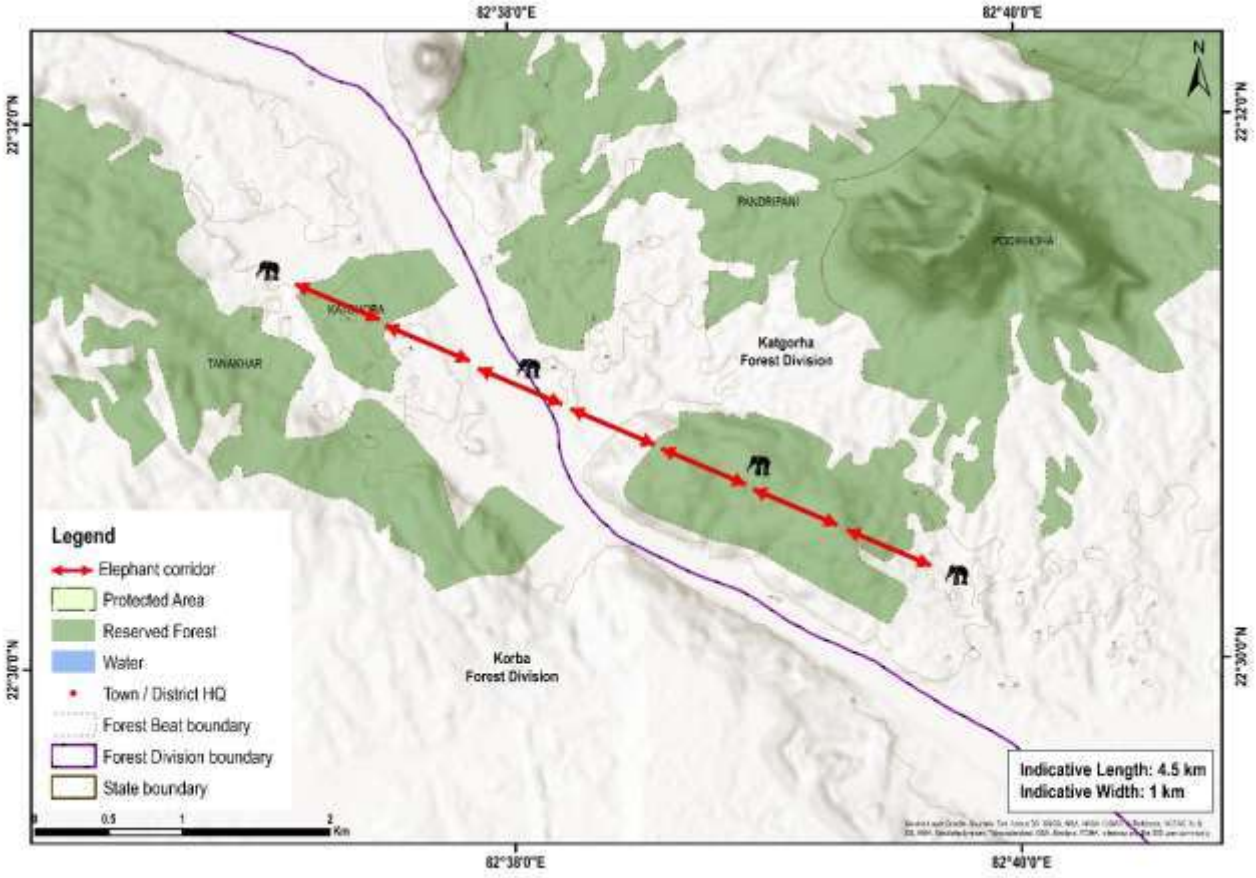
## 7. Balco - Etma Nagar corridor

| | |
|---|---|
| **Connectivity** | **Korba and Katghora Forest Divisions across River Hasdeo** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 7.5 km, width = 1.5 km |
| **Geo coordinates** | 22.58413, 82.54890<br>22.55741, 82.62051 |
| **Compartments falling within corridor** | OA 736, P529, OA 763, OA 762, OA 1223 |
| **Beats falling within corridor** | Tanakhar, Patha, Kachar |
| **Forest ranges falling within corridor** | Etma Nagar (Katghora) and Balco (Korba) |
| **Ecological importance** | This is the main corridor used by elephants to move between Korba and Katghora Forest Divisions. |
| **Habitat type** | Sal-dominated dry deciduous forests |
| **Major land use** | Forests, agriculture and settlements. |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



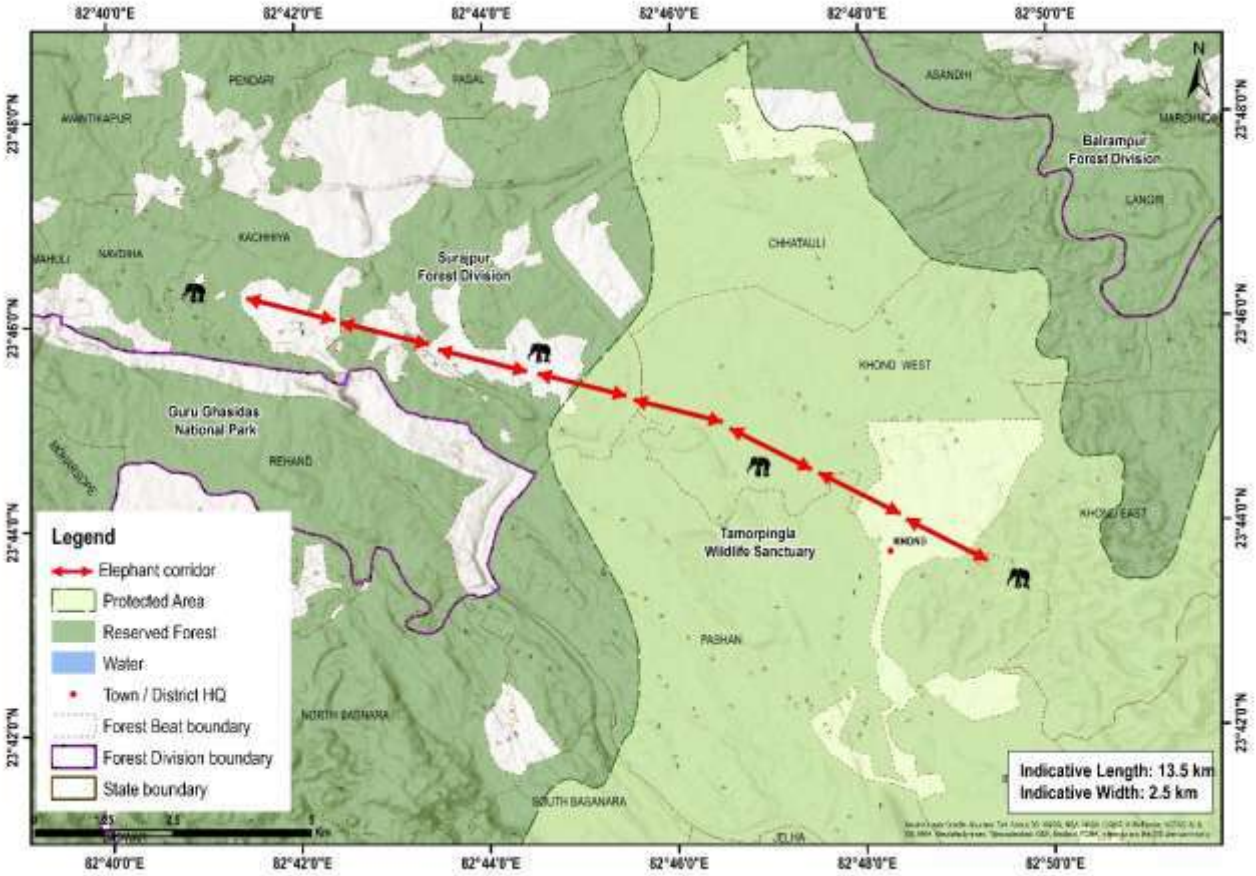
## 8. Balco- Katghora corridor

| | |
|---|---|
| **Connectivity** | **Korba and Katghora Forest Divisions across River Hasdeo** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 4.5km, width = 1 km |
| **Geo coordinates** | 22.52544, 82.62007<br>22.50223, 82.66176 |
| **Compartments falling within corridor** | OA 1229, OA 766 |
| **Beats falling within corridor** | Podikhoha, Katghora |
| **Forest ranges falling within corridor** | Katghora (Katghora) and Balco (Korba) |
| **Habitat type** | Tropical Dry Deciduous |
| **Major land use** | Forests, agriculture and settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



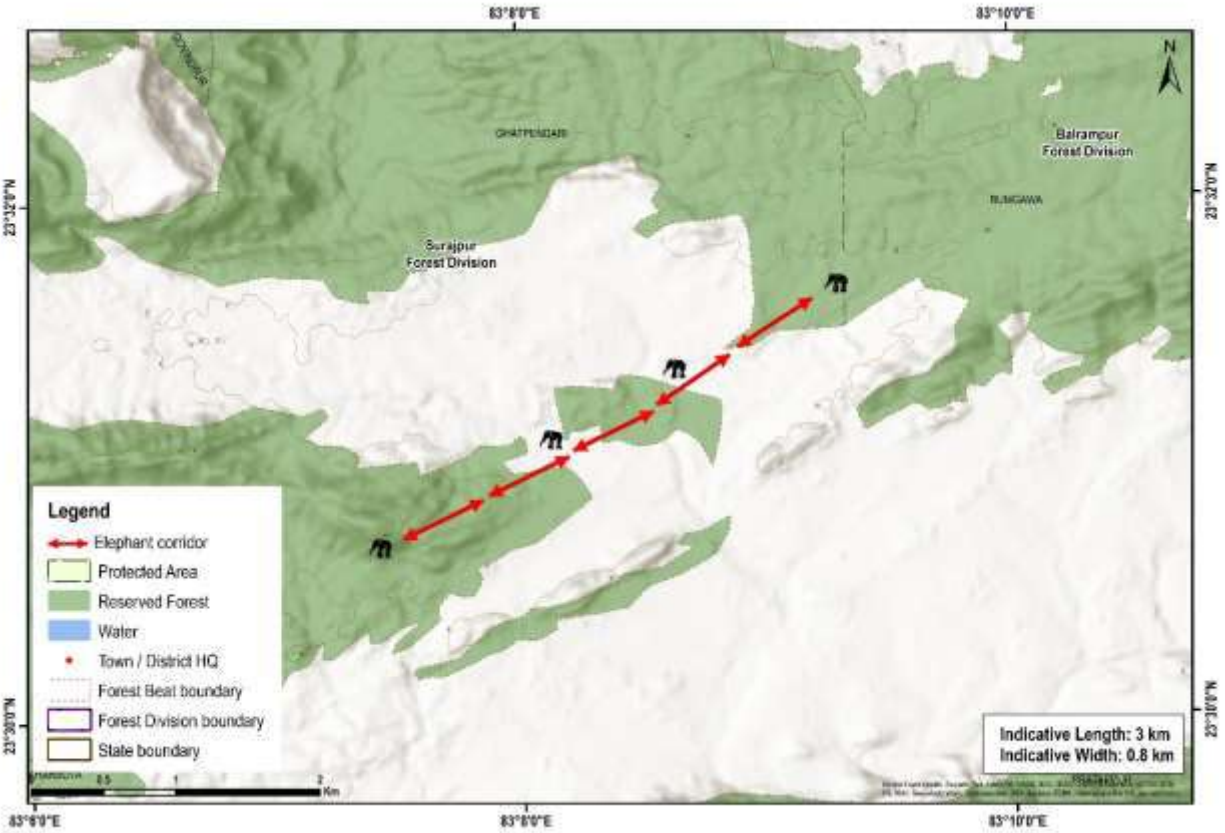
## 9. Khod-Rihand corridor

| | |
|---|---|
| **Connectivity** | **Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuary across River Rihand** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 13.5 km, width = 2.5 km |
| **Geo coordinates** | 23.774510, 82.693394<br>23.720701, 82.822966 |
| **Compartments falling within corridor** | 914, 896, 897, 899, 900, 898, P 561, P 588, P 557 |
| **Beats falling within corridor** | Khod, Khod (W), Kachiya |
| **Forest ranges falling within corridor** | Khod (Tamor Pinlga WLS), Biharpur and Rihand |
| **Ecological importance** | This is an important corridor that connects elephant populations between Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuary across Surajpur Forest Division |
| **Habitat type** | Sal-dominated dry deciduous forests |
| **Major land use** | Forests, agriculture and settlements |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



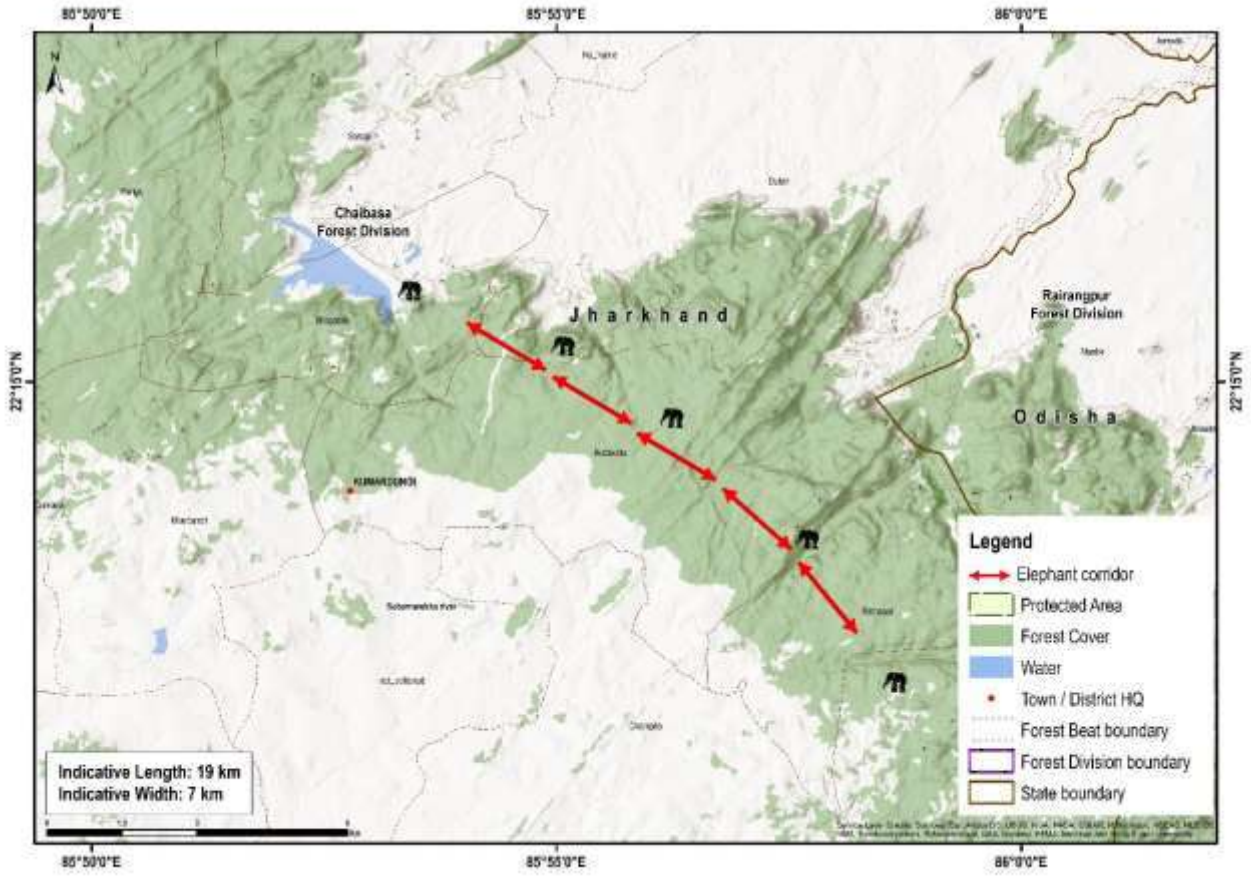
## 10. Ghat Pendari-Pakni corridor

| | |
|---|---|
| **Connectivity** | **Surajpur to Tamor Pingla Wildlife Sanctuary** |
| **State** | Chhattisgarh |
| **Indicative length and width** | Length = 3 km, width = 0.8 km |
| **Geo coordinates** | 23.52804, 83.12699<br>23.51064, 83.15176 |
| **Compartments falling within corridor** | P 112, P 111, P 109 |
| **Beats falling within corridor** | Ghat Pendari and Pakni |
| **Forest ranges falling within corridor** | Pratappur |
| **Ecological importance** | This is an important corridor connecting elephant populations of Surajpur and Tamor Pingla Wildlife Sanctuary. |
| **Habitat type** | Sal-dominated dry deciduous forests |
| **Major land use** | Forests |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



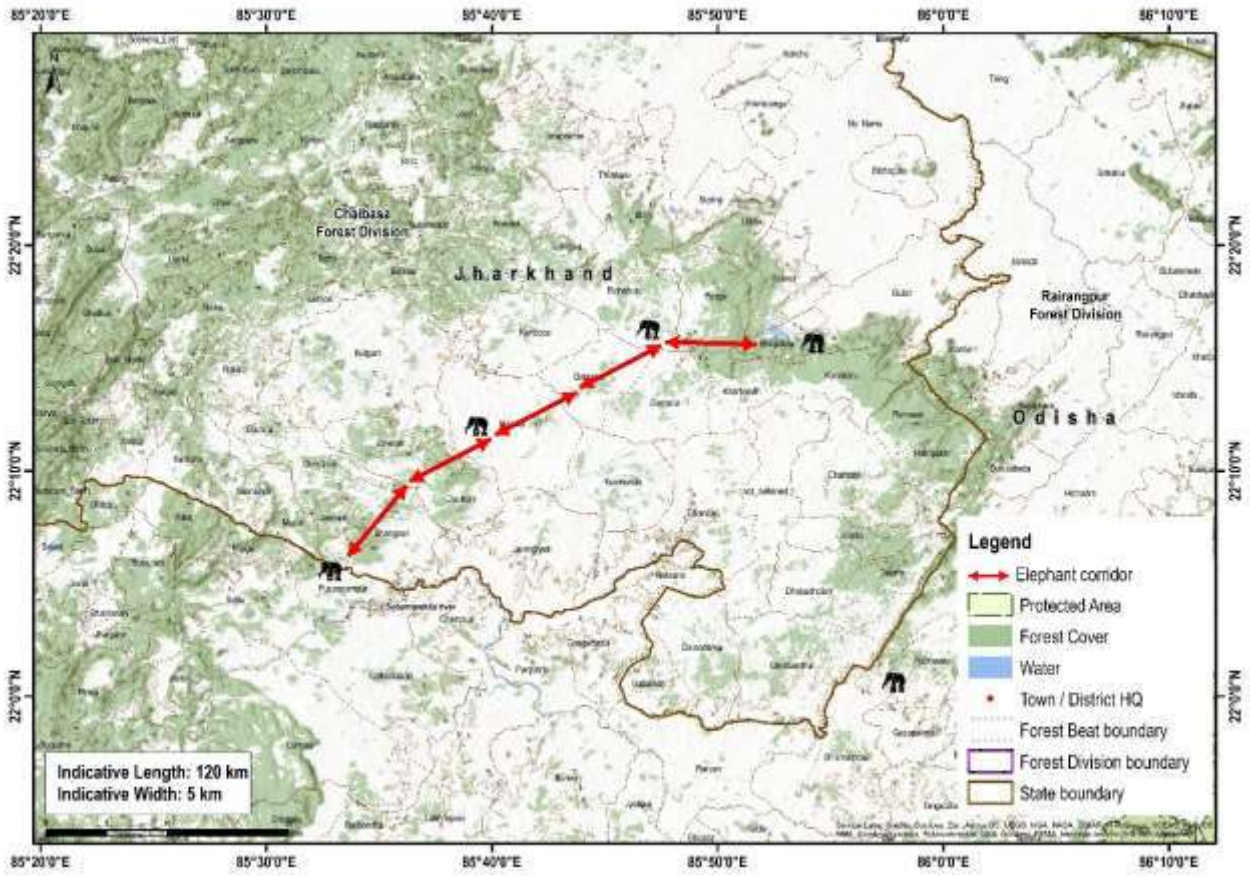
## 11. Bhagabilla- Ratnasai Corridor

| | |
|---|---|
| **Connectivity** | **Hatgamharia Range of Chaibasa Forest Division to Rairangpur Forest division in Odisha** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 19 km; width = 2 to 7 km |
| **Geo coordinates** | N 22º15'44.9", 22º12'2"/ E 85º 53'54", 85º 58'27.38" |
| **Forest ranges falling within corridor** | Hatgamharia Range |
| **Revenue villages falling within corridor** | 39 |
| **Ecological importance** | The area is an important migratory corridor with increasing number of elephants this corridor on a regular basis. |
| **Habitat type** | Dry deciduous, Sal-dominated forests |
| **Major land use** | Forest = 3,224 ha<br>Agricultural land = 12,000 ha |
| **Elephant movement status** | Regular, more frequent from October to February |
| **Number of elephants using the corridor** | 26 |
| **Linear infrastructure in the corridor** | High tension power line (11,000 V) |
| **Recommendations by the forest department to improve the corridor** | Habitat improvement activities in the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



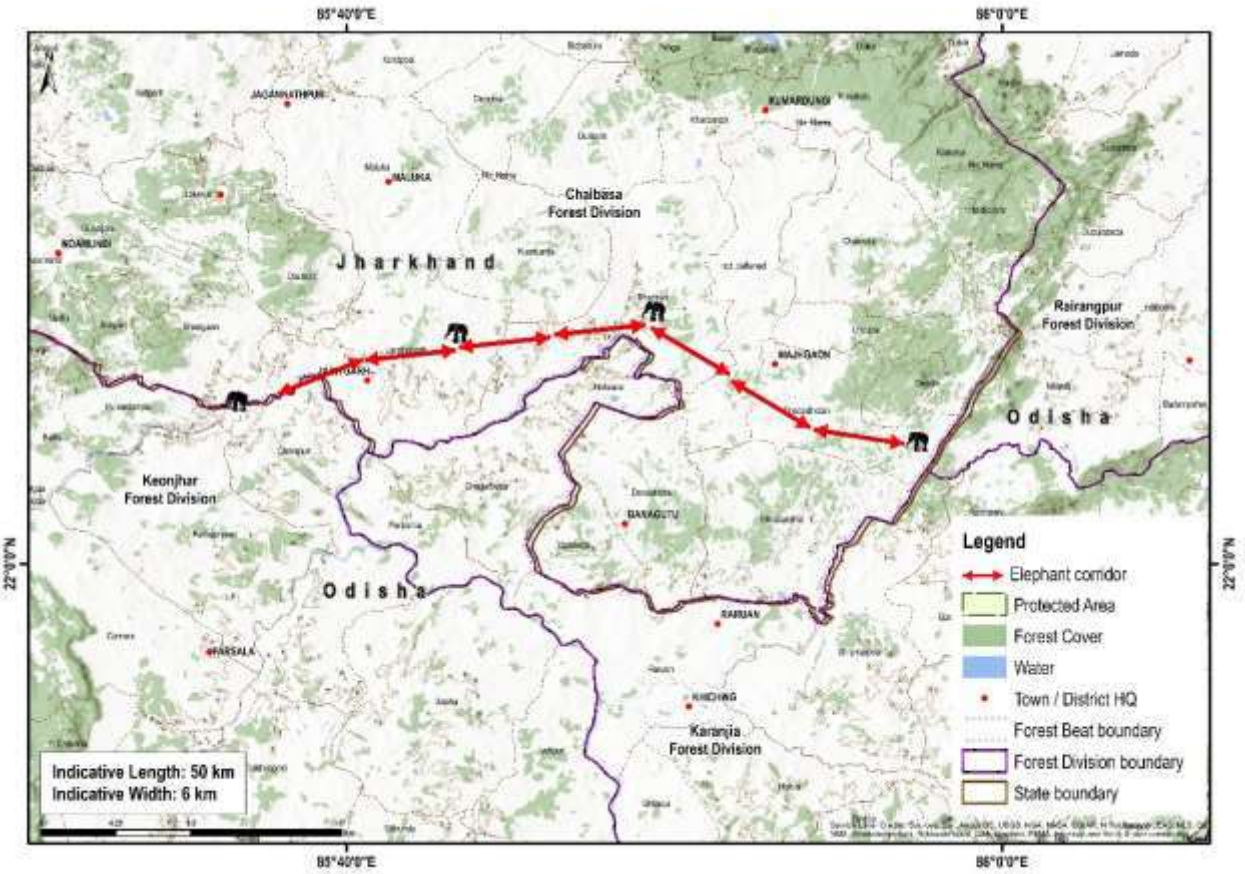
## 12. Jampani- Bhagabilla Corridor

| | |
|---|---|
| **Connectivity** | **Elephant movement is from Noamundi Range to Hatgamharia Range of Chaibasa Forest Division in Jharkhand to Keonjhar Forest Division in Odisha** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 120 km; Width = 2 to 5 km |
| **Geo coordinates** | N 22°5'41.98", 22°15'44.98"/ E 85° 33'19.79", 86° 53'54" |
| **Forest ranges falling within corridor** | Hatgamharia and Noamundi Ranges in Chaibasa Forest Division |
| **Revenue villages falling within corridor** | 44 |
| **Ecological importance** | The corridor is important in sustaining seasonal elephant migration between Odisha and Jharkhand. The number of elephants using the corridor has been increasing. |
| **Habitat type** | Dry deciduous Sal dominated forest |
| **Major land use** | Forest = 1551.9 ha<br>Agriculture + human-use = 12,000 ha |
| **Elephant movement status** | Regular, more frequent from October to February |
| **Number of elephants using the corridor** | 20 - 25 |
| **Linear infrastructure in the corridor** | High tension power line (11,000 V) |
| **Recommendations by the forest department to improve the corridor** | Habitat improvement in the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



## 13. Siyaljora- Dhobadhobin Corridor

| | |
|---|---|
| **Connectivity** | **This corridor is used by elephants for moving from Keonjhar Forest Division in Odisha to Sayiljora RF of Noamundi Range towards Dhobadhobin RF of Hatgamharia Range in Chaibasa Forest Division and eventually into Rairangpur Forest Division of Odisha.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 50 km, Width = 2 - 6 km |
| **Geo coordinates** | N 22º 5' 5.15", 22º 3' 36.40"/ E 85º 37' 48.49", 86º 56' 44.59" |
| **Forest ranges falling within corridor** | Siyaljora, Noamundi, Dhobadhobin and Hatgamharia Forest Ranges of Chaibasa Forest Division |
| **Revenue villages falling within corridor** | 33 |
| **Habitat type** | Sal-dominated dry deciduous forests |
| **Major land use** | Forest land = 667.7 ha<br>Agricultural lands + human-use areas = 9200 ha |
| **Elephant movement status** | Regular, more frequent from October to February |
| **Number of elephants using the corridor** | 26 |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Habitat improvement in the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |

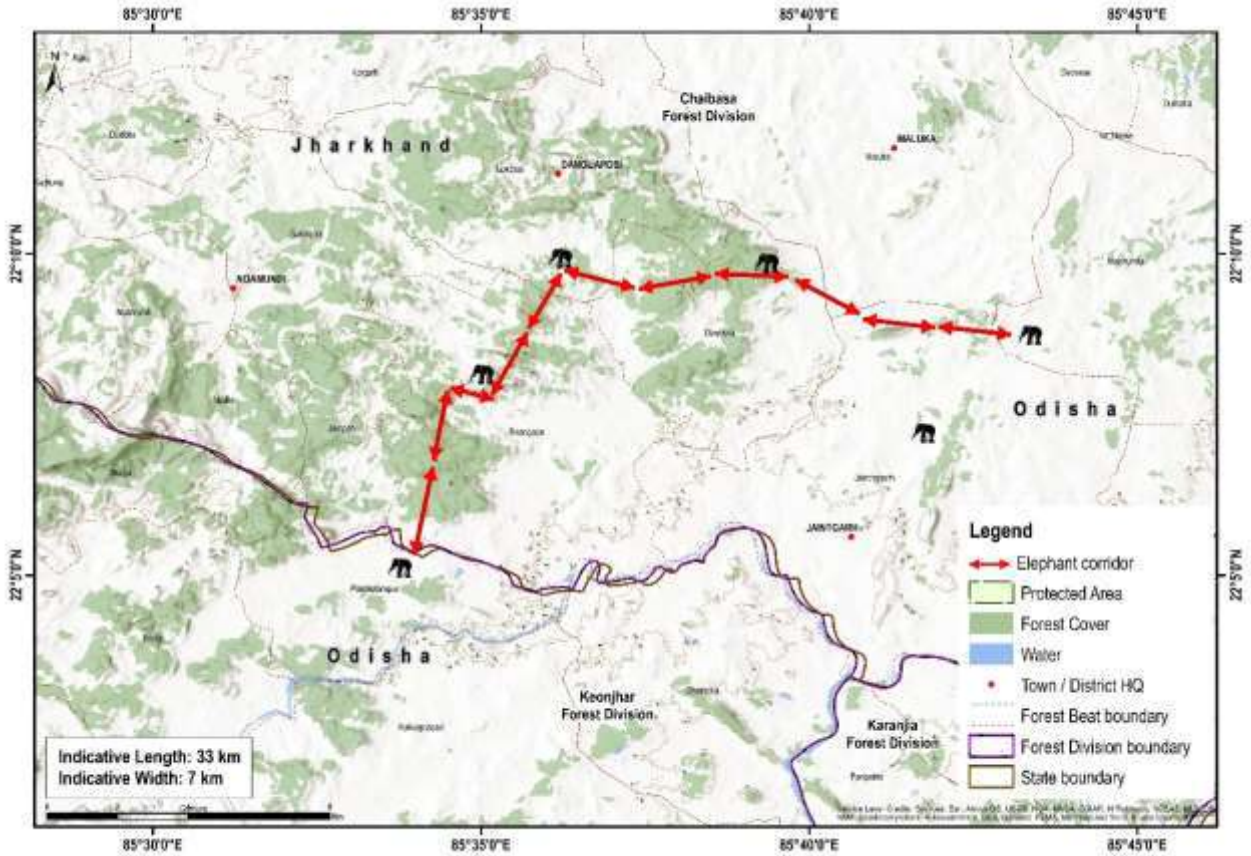


## 14. Sangajata- Haldipokhar Corridor

| | |
|---|---|
| **Connectivity** | **Elephants use this corridor to move from Saraikela Forest Division in Jharkhand to Haldipokhar Range in Chaibasa Forest Division. Some elephants also go up to Rairangpur Forest Division in Odisha.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 96 km, width = 2 to 6 km |
| **Geo coordinates** | N 22° 40'25.83", 22° 9'45.06"/ E 85° 51'55.15", 85° 0'55.65" |
| **Forest ranges falling within corridor** | Haldipokhar Range in Chaibasa Forest Division |
| **Revenue villages falling within corridor** | 74 |
| **Habitat type** | Sal-dominated dry deciduous forest |
| **Major land use** | Forest = 3226.7 ha<br>Agriculture + human-use = ~21,500 ha |
| **Elephant movement status** | Regular, more frequent from October to February |
| **Number of elephants using the corridor** | 26 |
| **Linear infrastructure in the corridor** | Two High tension power lines (11,000 V) |
| **Recommendations by the Forest Department to improve the corridor** | Habitat improvement in the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |

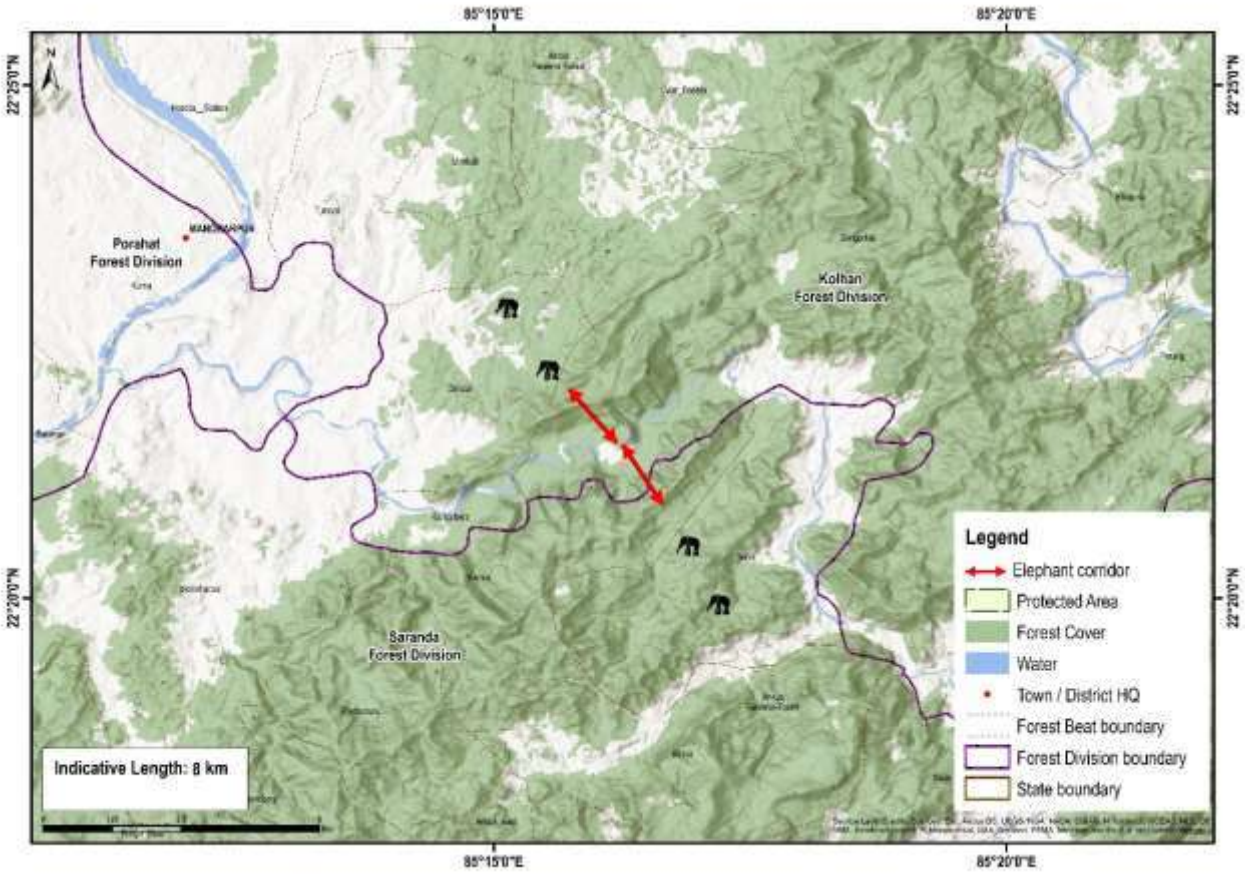
## 15. Lepang- Dumuria Corridor

| | |
|---|---|
| **Connectivity** | **Elephants use this corridor to move from Lepang RF of Noamundi Range in Chaibasa Forest Division to Keonjhar Forest Division in Odisha** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 33 km, width = 2 - 7 km |
| **Geo coordinates** | N 22º 5'8.55", 22º 8' 44.96"/ E 85º 35' 7.03", 85º 42' 57.14" |
| **Forest ranges falling within corridor** | Noamundi Forest Range |
| **Revenue villages falling within corridor** | 18 |
| **Administrative details of the corridor** | The corridor connects the Haldipokhar Reserve Forest to the Sangajata Reserve Forest and maintains the connectivity with Simlipal Tiger Reserve in Odisha. |
| **Habitat type** | Sal-dominated dry deciduous forest |
| **Major land use** | Forest = 540.5 ha<br>Agriculture + habitation = 5200 ha |
| **Elephant movement status** | Regular, more frequent from October to February |
| **Number of elephants using this corridor** | 26 |
| **Linear infrastructure in the corridor** | High tension power line (11,000 V) |
| **Recommendations by the Forest Department to improve the corridor** | Increasing the green cover in the corridor |
| **Current status of the corridor** | Active. Information on intensity of use not available. |



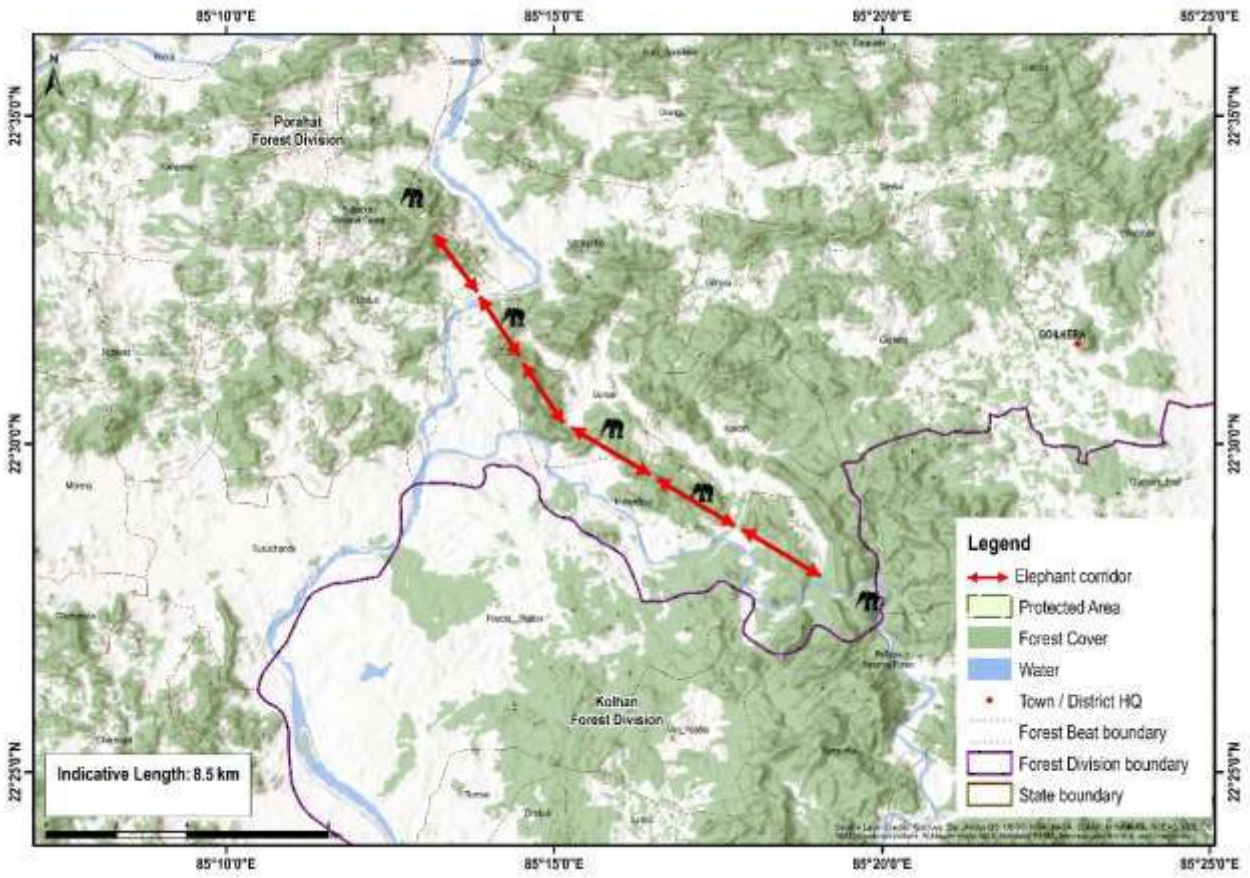
## 16. Ankua- Ambia Corridor

| | |
|---|---|
| **Connectivity** | **The corridor links that Ambia- 11,12 Reserve Forest in Saranda Forest Division to Dimbuli Reserve Forest in Kolhan Range, Kolhan Forest Division** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 8 km |
| **Geo coordinates** | N 22° 20'53", 22° 29'34"/ E 85° 14'41", 85° 14'46" |
| **Forest ranges falling within corridor** | Kolhan Forest Range |
| **Revenue villages falling within corridor** | 18 |
| **Ecological importance** | In addition to elephants, several other wildlife uses this very important corridor |
| **Habitat type** | Sal-dominated dry deciduous forest |
| **Major land use** | Forest = 1908 ha<br>Agriculture = 343 ha |
| **Elephant movement status** | Elephant movement has decreased over years. Elephants mainly use this corridor from August to March |
| **Number of elephants using this corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) High tension power line (11,000 V)<br>2) State Highway, around 3 km of the road passes through the corridor, with frequent heavy vehicle movement |
| **Recommendations by the forest department to improve the corridor** | Overpass for the elephants to cross the State Highway (Gua – Salai) passing through the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



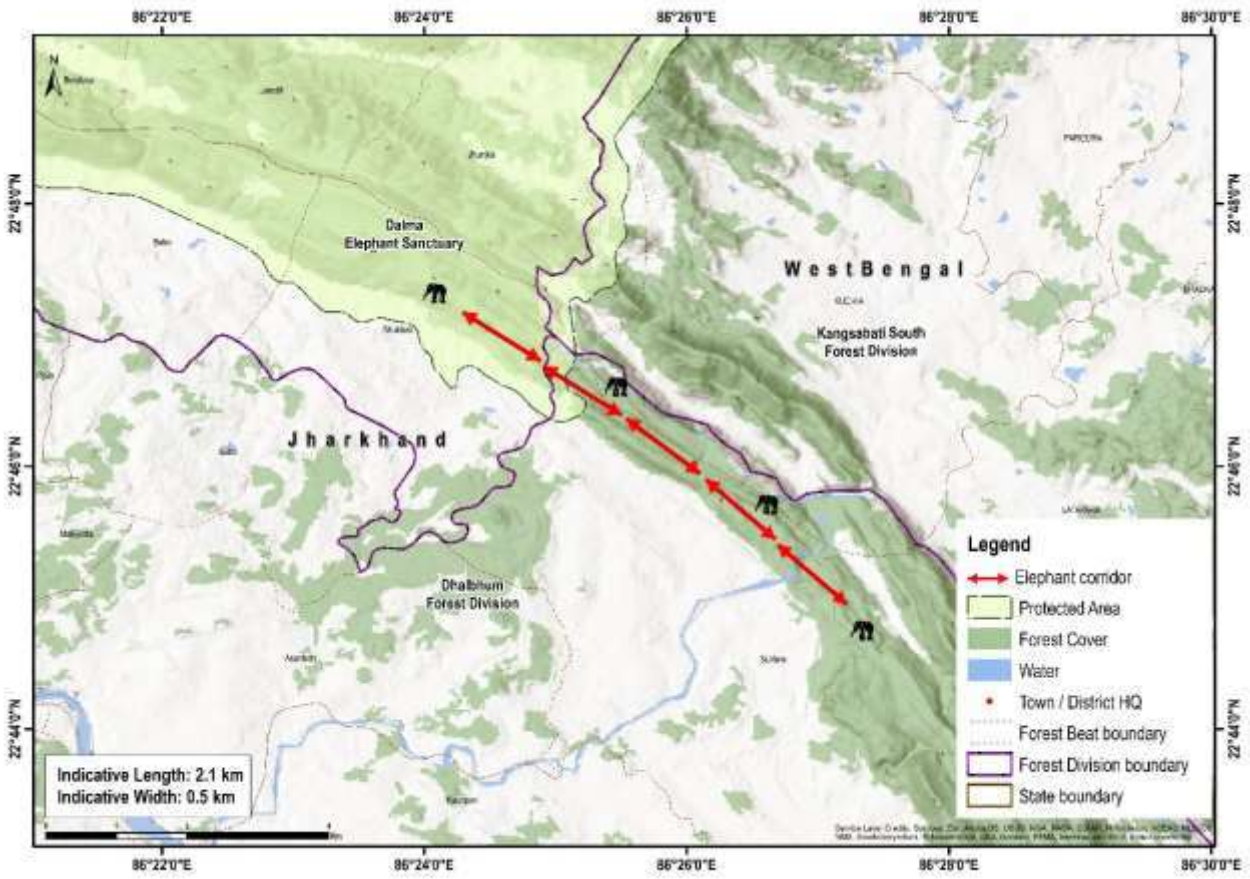
## 17. Raibera- Pulbaburu Corridor

| | |
|---|---|
| **Connectivity** | **Elephants move between Raibera of Kolhan Forest Division to Pulbaburu of Porahat Forest Division along Raibera PF, Derwan PF, Panta PF, Anandpur (PF 13 & 14) and Ambia RF** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 8.5 km |
| **Geo coordinates** | N 22°28'42", 22°29'36"/ E 85° 17'52", 85° 17'56" |
| **Forest ranges falling within corridor** | Kolhan Range of Kolhan Forest Division |
| **Revenue villages falling within corridor** | 4 |
| **Ecological importance** | In addition to elephants, several other wildlife in the area uses this corridor |
| **Habitat type** | Dry deciduous Sal dominated forest |
| **Major land use** | Agricultural land and Sal dominated forest |
| **Elephant movement status** | Seasonal, mainly from August to March |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) Triple Railway lines of S.E.R connecting Goilkera and Manoharpur Station of Chakradharpur division, around 3 km of railway track falls under the Kolhan Forest Division<br>2) Railway Bridge on Karo River<br>3) 3 km of High-tension power line (11,000 V) |
| **Recommendations by the forest department to improve the corridor** | 1) Overpass for the elephants is required in the state highway passing through the corridor.<br>2) Monitoring Railway lines and imposing speed restriction very important |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



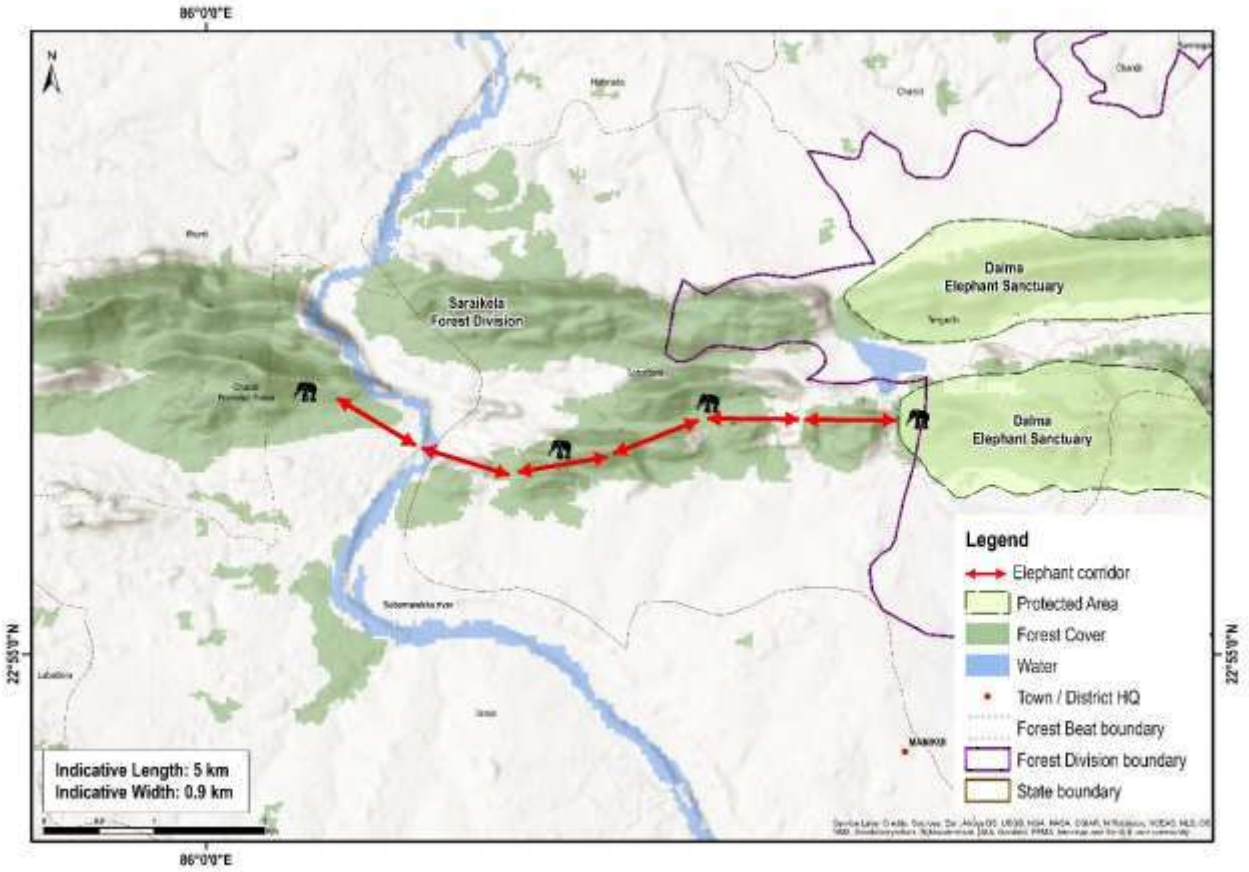
## 18. Dalapani - Suklara Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Dalma Wildlife Sanctuary to Kankrajhor Reserve Forest/ Dalapani Reserve Forest of Jamshedpur Forest Division of Jharkhand to Kankrajhor Reserve Forest, West Bengal.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 2.10 km, Width = 0.05 km |
| **Geo coordinates** | N 22°47'14.932", 22°45'8.375"<br>E 86° 24'12.399", 86° 26'50.412" |
| **Forest ranges falling within corridor** | Ghatshila Range |
| **Revenue villages falling within corridor** | No village within the corridor |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Forest = 9.75 ha<br>Agriculture = 0.5 ha<br>Habitation = 0.25 ha |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | Information NA |
| **Number of elephants using this corridor** | 28 |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the elephant corridor/migration.<br>2) Creation of water bodies inside corridors |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



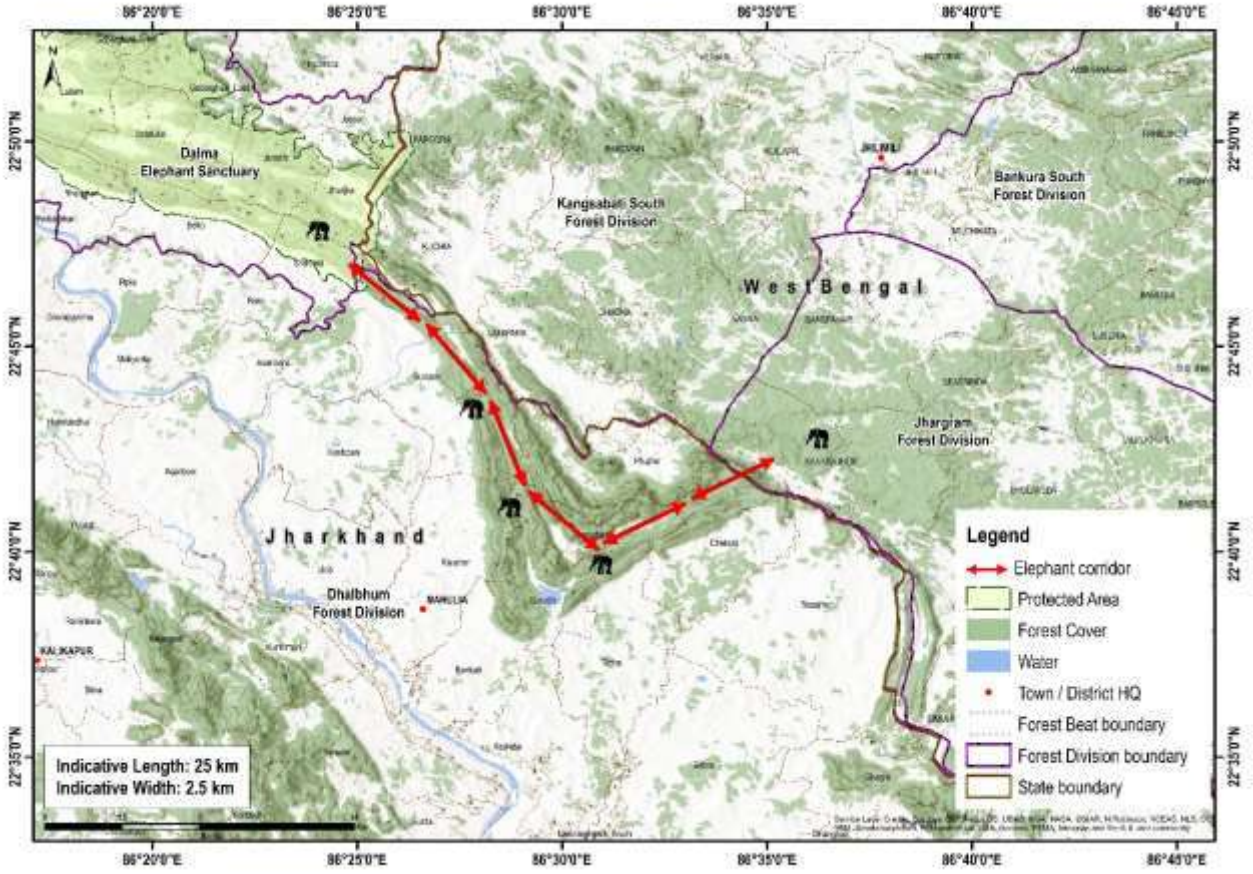
## 19. Dalma – Chandil Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Chandil, Dalma Wildlife West Range, to Chandil Territorial Range, Saraikela Forest Division** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 5 km, width = 0.9 km |
| **Geo coordinates** | N 22°56'7.077", 22°56'3.106" / E 86°03'24.923", 86°0'47.038" |
| **Forest ranges falling within corridor** | Chandil Range |
| **Revenue villages falling within corridor** | Six |
| **Habitat type** | Sal-dominated tropical dry deciduous forest |
| **Major land use** | Forest = 180 ha<br>Agriculture = 90 ha<br>Habitation = 30 ha |
| **Elephant movement status** | Occasional |
| **Number of elephants using this corridor** | 4 – 5 |
| **Linear infrastructure in the corridor** | 1) National Highway 33 and associated high traffic volume in the road<br>2) Broad gauge railway line<br>3) 200 m of Subarnarekha irrigation canal with cemented embankment<br>4) 2 km of High tension power line |
| **Recommendations by the forest department to improve the corridor** | 1) Corridor use by elephants decreased due to Subarnarekha canal, habitat degradation, Railway line and human habitation expansion. These factors to be looked into for corridor restoration.<br>2) Habitat enrichment along the elephant corridor/migration.<br>3) Creation of water bodies inside corridors<br>4) Over pass on Railway track passing through the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



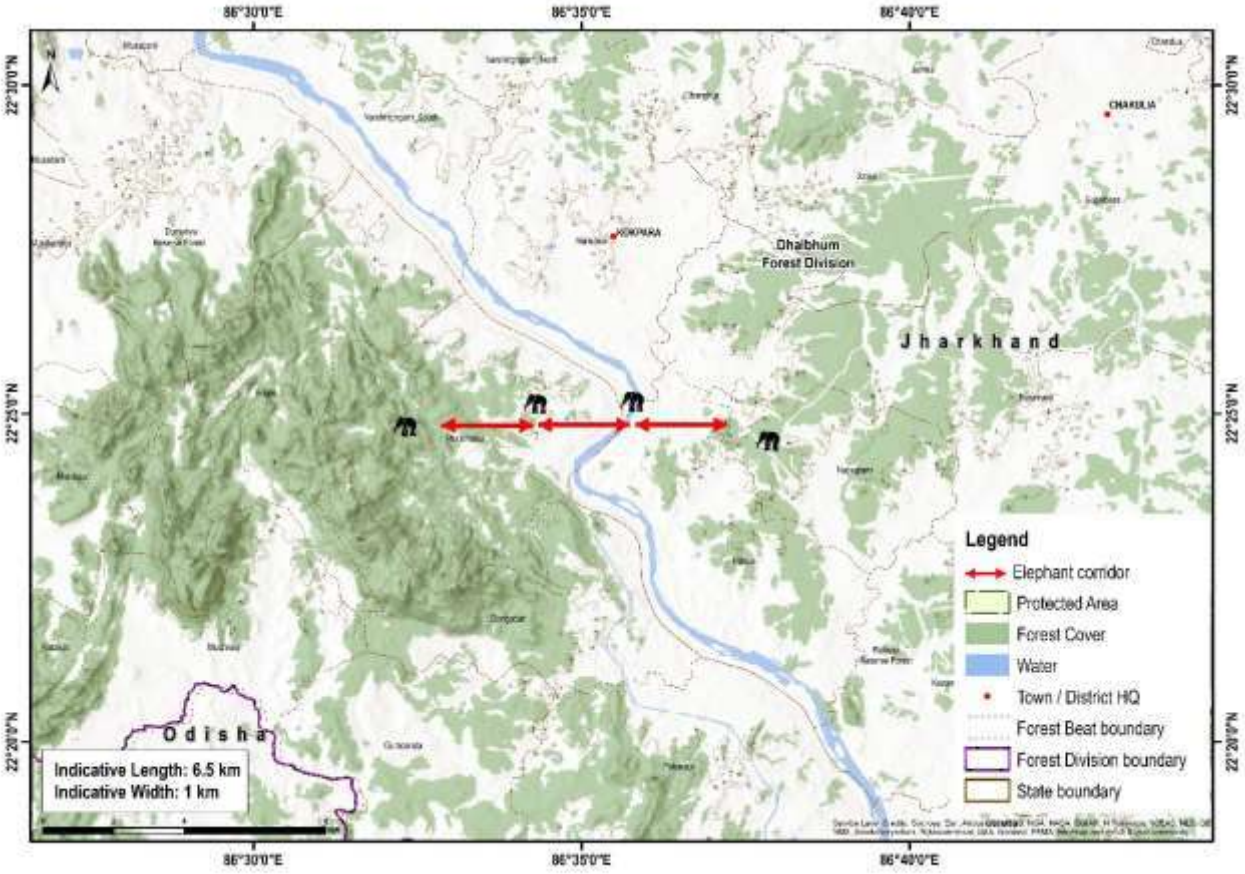
## 20. Dalapani - Kakrajhor Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Dalapani Reserve Forest of the Jamshedpur Forest Division, Jharkhand to Kakrajhor Protected Forest to West Midnapur Forest Division in West Bengal.** |
| **State** | Jharkhand and West Bengal |
| **Indicative length and width** | Length = 25 km, Width = 2.5 km |
| **Geo coordinates** | N 22º38'60", 22º47'32"/ E 86º 23'54", 86º 36'05" |
| **Forest ranges falling within corridor** | Ghatshila, East Singhbhum and Kankrajhor Ranges |
| **Revenue villages falling within corridor** | 10 |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Forest, agriculture lands, settlements and revenue lands |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Around 45 |
| **Linear infrastructure in the corridor** | 1) State Highway connecting Galudih to Bandhuan (1 km) and associated high traffic<br>2) 200m of Chandil canal with cemented embankment<br>3) 12 km of High tension power line |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the elephant corridor/migration.<br>2) Creation of water bodies inside corridors<br>3) Forest fire protection measures<br>4) Creation of Quick Response Teams for any elephant related issue.<br>5) The West Bengal FD has dug up a trench along the inter-state boundary. This has to be reviewed. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



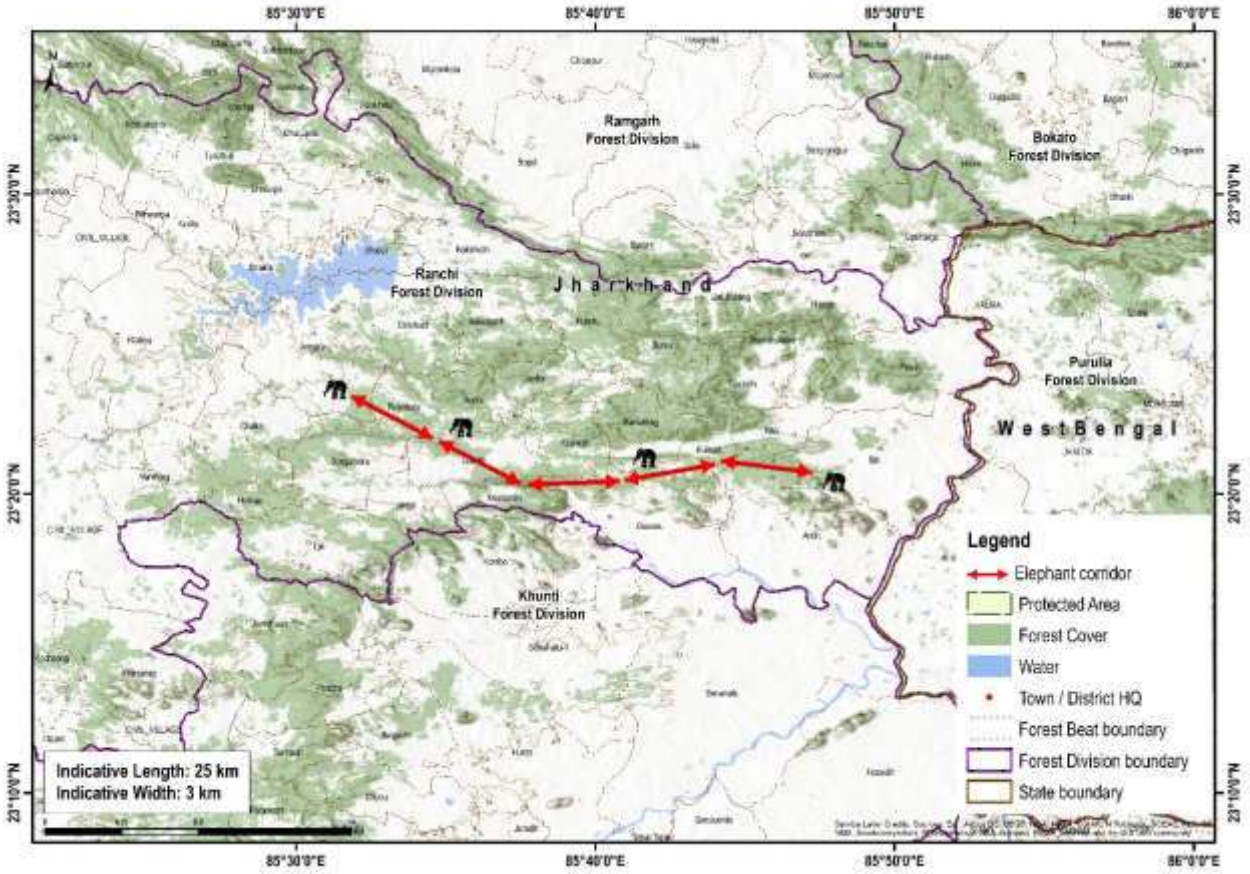
## 21. Dumariya - Nayagram Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects the Dumriya Reserve Forest of Musabani Range with the Nayagram Reserve Forest of Chakuliya Range under Jamshedpur Forest Division.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 6.5 km, Width = 1 km |
| **Geo coordinates** | N 22°23'34", 22°25'46"/ E 86° 32'52", 86° 38'24" |
| **Forest ranges falling within corridor** | Chakulia and Musabani Range |
| **Revenue villages falling within corridor** | 11 |
| **Habitat type** | Tropical Dry deciduous forest |
| **Major land use** | Forest, Agriculture land, settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 70 - 80 |
| **Linear infrastructure in the corridor** | 1) National Highway- 33 and associated high traffic<br>2) Subarnarekha irrigation canal with cemented embankment, 15 km<br>3) High tension power line, 5 km |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the elephant corridor/migration.<br>2) Creation of water bodies inside corridors<br>3) Forest fire protection measures<br>4) Creation of Quick Response Teams for any elephant related issue.<br>5) The West Bengal FD has dug up a trench along the inter-state boundary. This has to be reviewed. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



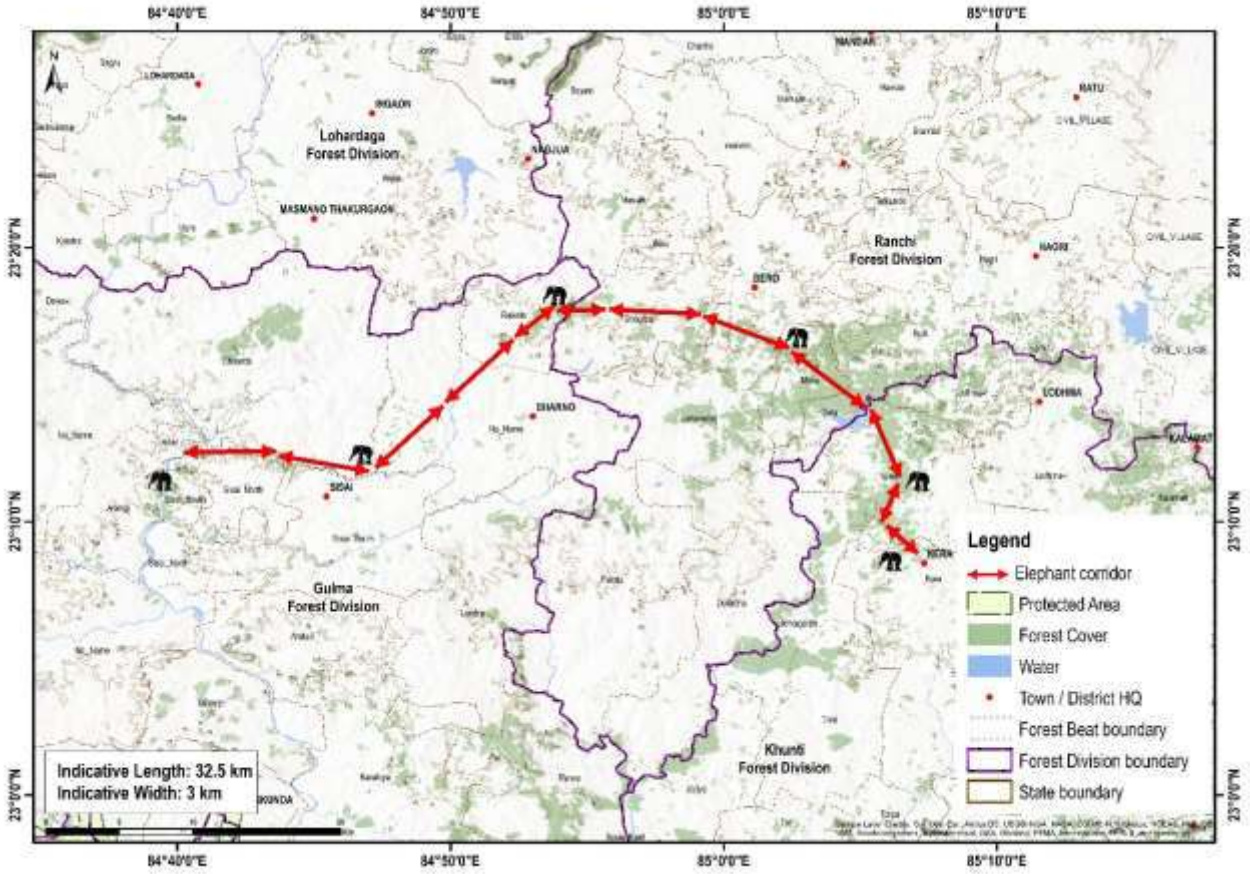
## 22. Silli – Angara

| | |
|---|---|
| **Connectivity** | **The connectivity is between Mahilong in Ranchi East Forest Range of Ranchi Forest Division to Tamar Range of Khunti Forest Division.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 25 km, Width = 0-3 km |
| **Geo coordinates** | 23.353216° N, 85.600742° E |
| **Forest ranges falling within corridor** | Mahilong Range |
| **Revenue villages falling within corridor** | 16 |
| **Habitat type** | Sal-dominated dry deciduous forest |
| **Major land use** | Forest = 2582.5 ha<br>Agriculture = 1231.6 ha<br>Habitation = 578.7 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 24 |
| **Linear infrastructure in the corridor** | 1) National Highway-33 and associated high traffic<br>2) 15km of Subarnarekha irrigation canal with cemented embankment<br>3) 5 km of High tension power line |
| **Bottleneck in the corridor** | Trench along the West Bengal border |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the elephant corridor/migration.<br>2) Forest fire protection measures. More funds required in FFPM, CSS for this region, especially and firefighting squad.<br>3) Dedicated rapid response teams. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



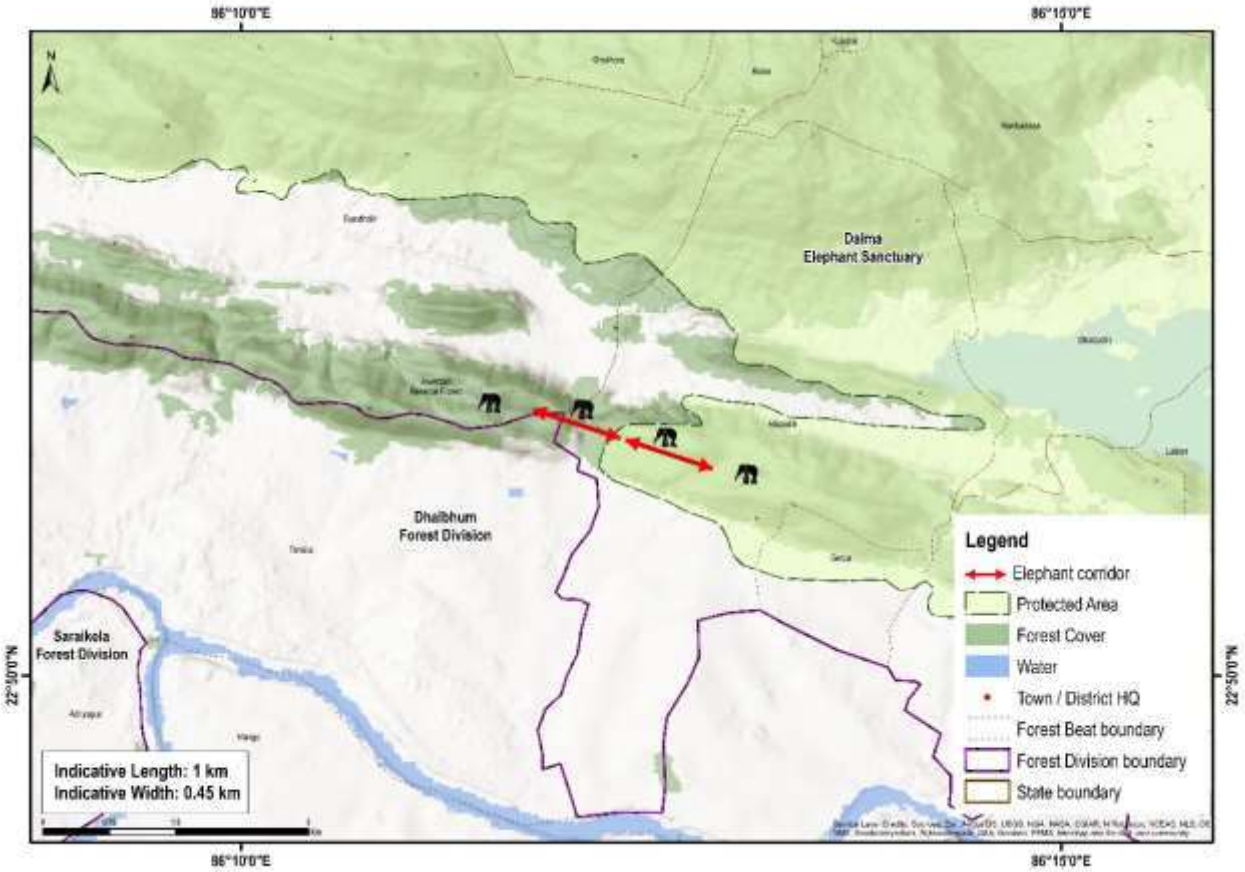
## 23. Bharno - Bero - Kara

| | |
|---|---|
| **Connectivity** | **The connectivity is between Mahilong in Ranchi East Forest Range of Ranchi Forest Division to Tamar Range of Khunti Forest Division.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 35 km, width = 0-3 km |
| **Geo coordinates** | 23.29095° N, 84.988069° E |
| **Forest ranges falling within corridor** | Mahilong Range |
| **Revenue villages falling within corridor** | 16 |
| **Habitat type** | Sal-dominated dry deciduous forest |
| **Major land use** | Forest = 1714.5 ha<br>Agriculture = 1285.8 ha<br>Habitation = 1143.0 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 24 |
| **Linear infrastructure in the corridor** | 1) National Highway- 33 and associated high traffic<br>2) Subarnarekha irrigation canal with cemented embankment, 15 km<br>3) High tension power line, 5 km |
| **Bottleneck in the corridor** | Lamkana, Khirda, Hathu areas |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the corridor<br>2) Fire protection measures to be taken up<br>3) Dedicated Rapid Response Teams |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



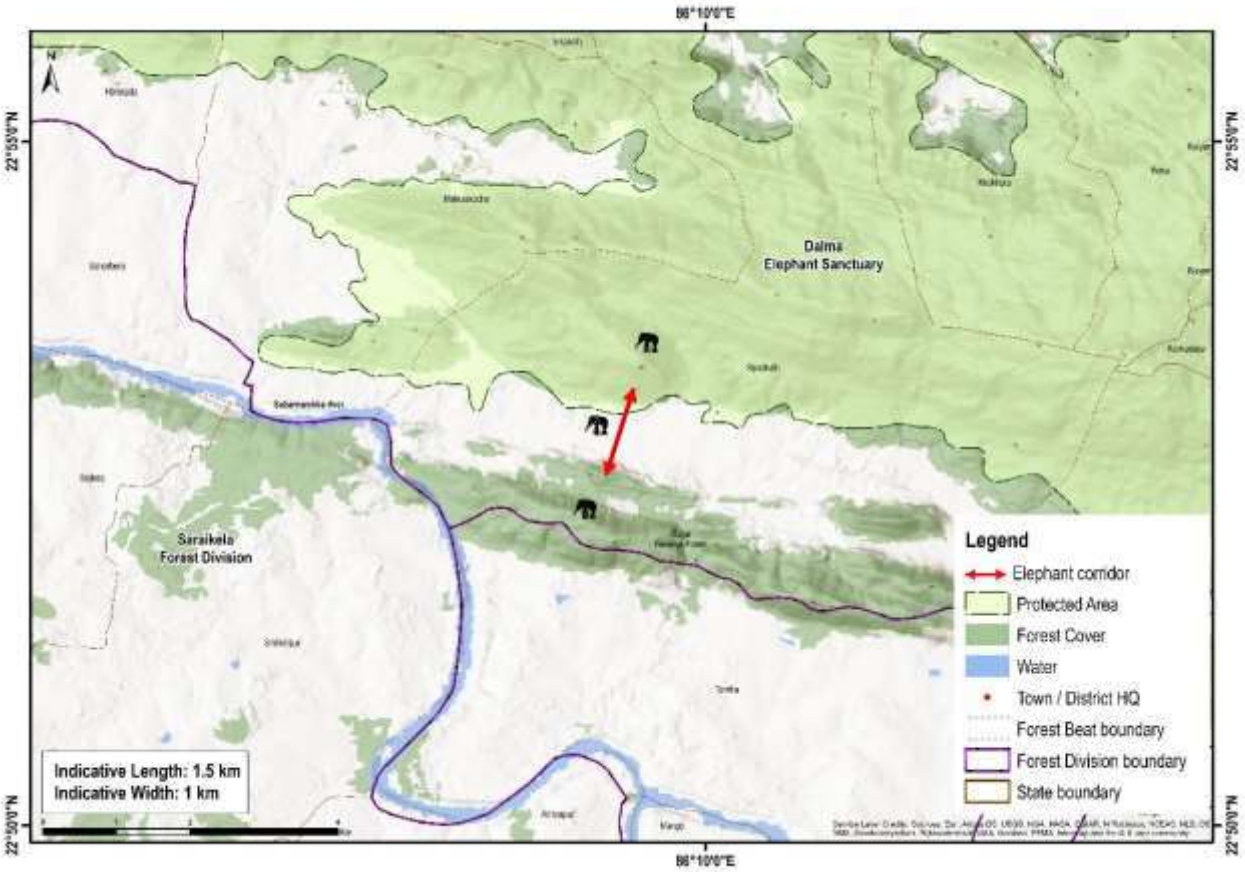
## 24. Dalma- Asanbani

| | |
|---|---|
| **Connectivity** | **The connectivity is between Dalma Wildlife West Range, Chandil to Chandil Territorial Range, Chandil.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 1 km, Width = 0.28- 0.45 km |
| **Geo coordinates** | N 22° 51' 25.618'' , 22° 51' 46.484'' to E 86° 12' 29.242'' to 86° 11' 50.127'' |
| **Forest ranges falling within corridor** | Dalma Wildlife West Range and Chandil Range |
| **Revenue villages falling within corridor** | Information NA |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Forests |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 8-10 |
| **Linear infrastructure in the corridor** | 1) National Highway- 33 and associated high traffic<br>2) High-tension power line, 0.5 km |
| **Bottleneck in the corridor** | National Highway- 33 |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat enrichment along the elephant corridor/migration.<br>2) Overpass construction for vehicles for unhindered movement of elephants. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



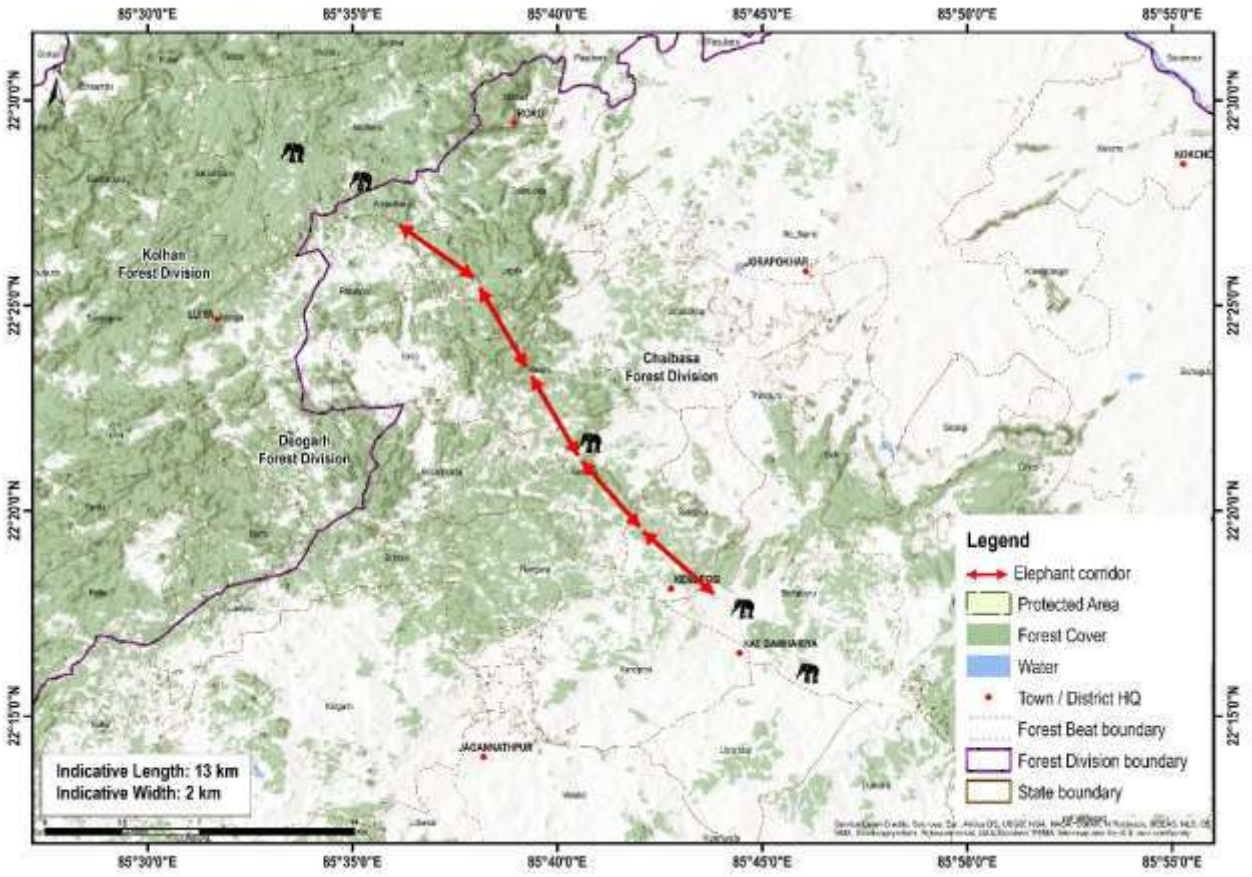
## 25. Dalma - Rugai

| | |
|---|---|
| **Connectivity** | **The connectivity is between Dalma Wildlife West Range, Chandil to Chandil Territorial Range, Chandil.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 1.5 km, Width = 1 km |
| **Geo coordinates** | :N 22° 52' 56.978'' , 22° 52' 29.049'' to E 86° 09' 57.16'' to 86° 9' 47.303'' |
| **Forest ranges falling within corridor** | Dalma Wildlife West Range and Chandil Range |
| **Revenue villages falling within corridor** | 1 |
| **Habitat type** | Tropical Dry deciduous forest |
| **Major land use** | Forests, Agricultural land and Settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 8-10 |
| **Linear infrastructure in the corridor** | 1) National Highway- 33 and associated high traffic<br>2) High-tension power line, 0.5 km<br>3) Subarnarekha irrigation canal, cement embankment, 1 km |
| **Bottleneck in the corridor** | Ramgarh |
| **Recommendations by the forest department to improve the corridor** | Habitat enrichment along the elephant corridor/migration |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



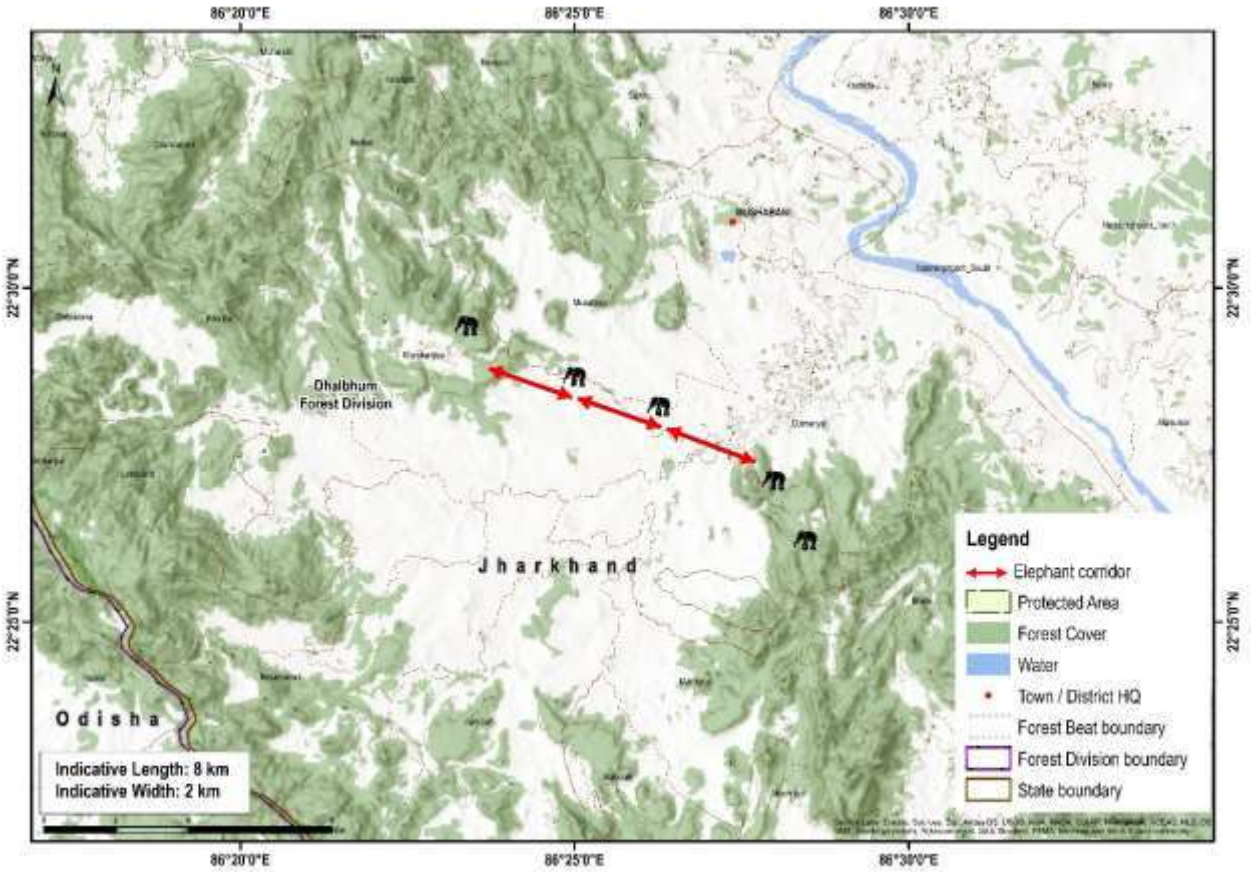
## 26. Anjadbera - Bichaburu Corridor

| | |
|---|---|
| **Connectivity** | **Bichaburu Protected Forest with Anjadbera Protected Forest leading to Kolhan and Saranda Forest areas.** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 13 km, Width = 2 km |
| **Geo coordinates** | 22°20' N<br>85°45' E |
| **Forest ranges falling within corridor** | Chaibasa and Hatgmaria Ranges |
| **Revenue villages falling within corridor** | 5 |
| **Habitat type** | Tropical Dry deciduous forest |
| **Major land use** | Forests, Agricultural land and Settlements |
| **Elephant movement status** | None |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | 1) Railway track (Noamuni-Chaibasa)<br>2) Road (Chaibasa-Champua) |
| **Bottleneck in the corridor** | Ramgarh |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the state<br>2) Regulate road and rail traffic<br>3) Habitat improvement of the degraded connecting forest |
| **Curren status of the corridor** | Impaired |



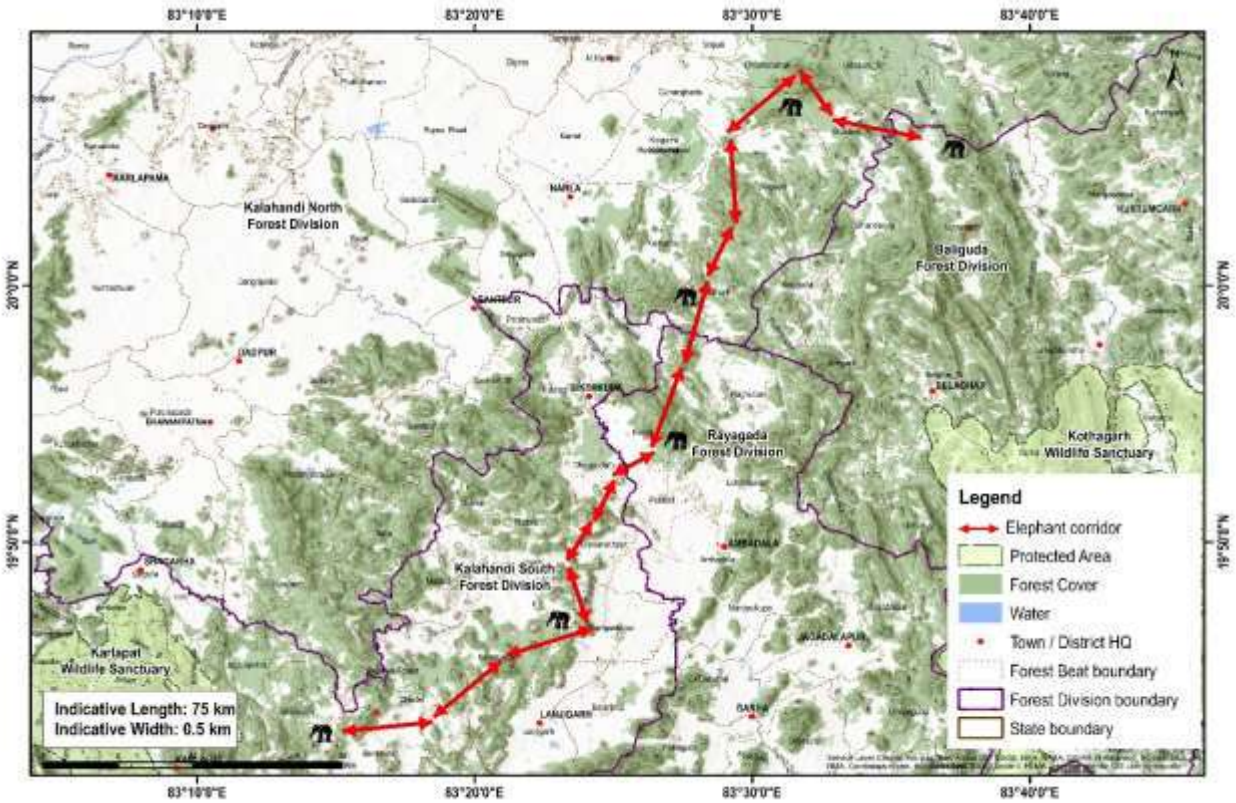
## 27. Dumria-Kundaluka and Murakanjia Corridor

| | |
|---|---|
| **Connectivity** | **Mosabani Range with Rakhamines Range in Dhalbhum** |
| **State** | Jharkhand |
| **Indicative length and width** | Length = 8 km, Width = 2 km |
| **Geo coordinates** | 22°27'–22°29' N<br>86°24'–86°28' E |
| **Forest ranges falling within corridor** | Musabani Range |
| **Revenue villages falling within corridor** | 10 |
| **Habitat type** | Tropical Dry deciduous forest |
| **Major land use** | Forests, Agricultural land and Settlements |
| **Elephant movement status** | None |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | Road (Ghatsila-Dumuriya-Hata) |
| **Bottleneck in the corridor** | Road (Ghatsila-Dumuriya-Hata) |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the State<br>2) Monitoring the land-use pattern of the corridor area to ensure no further constructions take place<br>3) Seek alternatives for settlements in the corridor, especially in Palasbani and Murakanjia.<br>4) Improvement of forest cover by natural regeneration |
| **Current status of the corridor** | Impaired |



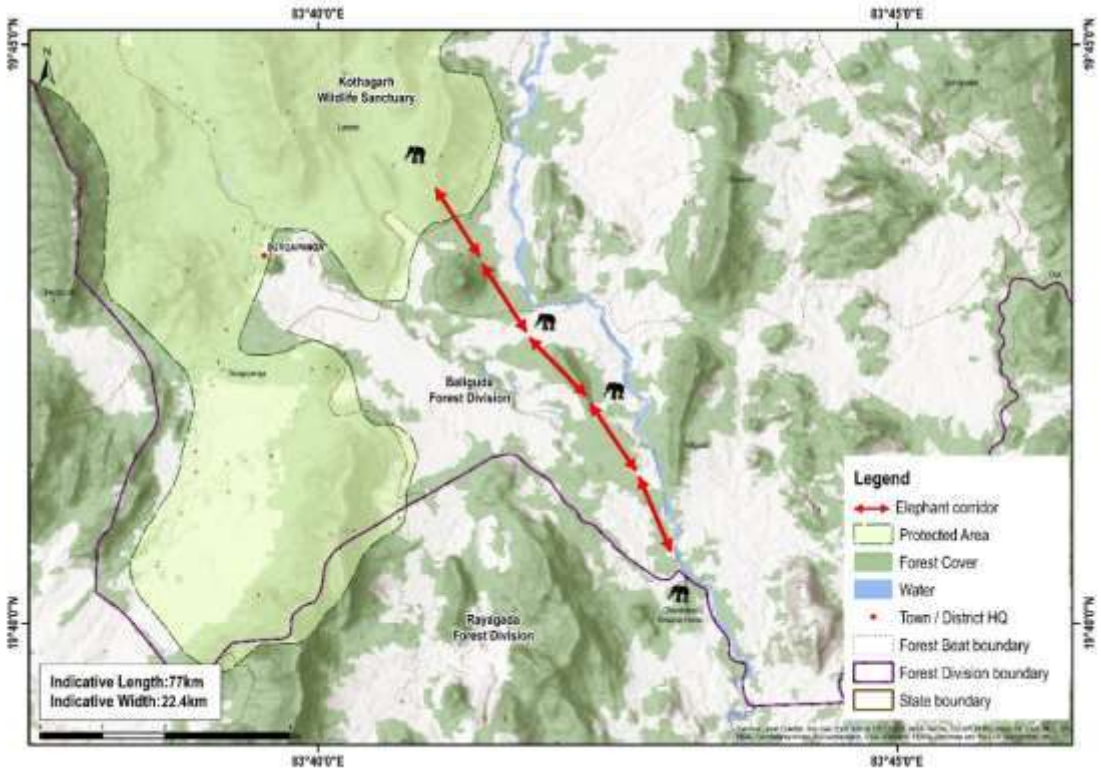
## 28. Karlapat-Urladani Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Karlapat reserve forest in Kalahandi North Forest Division and Kalahandi South Reserve forest via Rayagada Division** |
| **State** | Odisha |
| **Indicative length and width** | Length = 75 km, width = 0.5 km |
| **Geo Coordinates** | N 20.142841 E 83.241914<br>N 19.703743 E. 83.596708 |
| **Forest ranges falling within corridor** | Muniguda, Biswanthpur and Karalapat Sanctuary Range |
| **Revenue villages falling within corridor** | 17 – Rayagada Division |
| **Habitat type** | Tropical Dry Deciduous Forest |
| **Major land use** | Forest and Agricultural land |
| **Elephant movement status** | Not recorded by forest department |
| **No. of elephants using the corridor** | 6 in Rayagada Division |
| **Major bottleneck** | Agricultural field found between Forest Blocks |
| **Linear infrastructure in the corridor** | Rayagada Division<br>1) 3 km of State Highway 6 passes through the corridor<br>2) 6km of Double track electrified Broad gauge railway line<br>3) 8 km of High-tension power line (11 KV) |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat shall be developed with active cooperation of local people using sound silvlicultural techniques and taking up mix plantation with Fruit and Fodder species.<br>2) Elephant proof trench to be dug out to protect the agricultural crop and prevent human animal conflict.<br>3) Waterholes in more number to be created in the forest area. Renovation of old water holes inside forest is to be done periodically.<br>4) Salt licks to be developed near to water body and nallahs found in foothills of the forest in elephant movement area. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



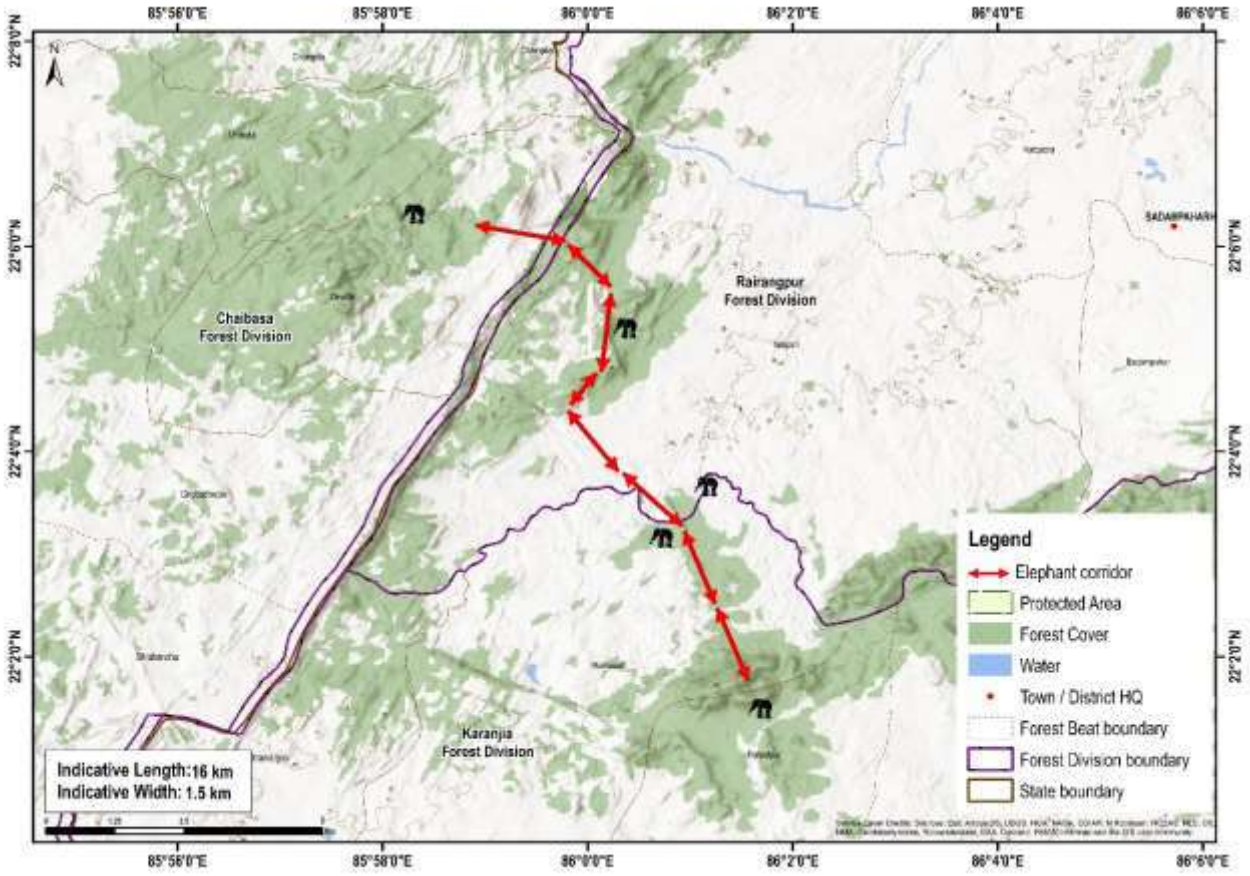
## 29. Kotagarh- Chandrapur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Kotagarh Wildlife Sanctuary with Pankhalgudi Reserve Forest under the Muniguda Range of Rayagada Forest Division.** |
| **State** | Odisha |
| **Indicative length and width** | Length = 77 km, width = 22.4 km |
| **Geo Coordinates** | N 19.96592 E 83.48061<br>N I9.42070 E.83.94061<br>N 19.97575 E 83.51303<br>N 19.51982 E 83.93684<br>N 19.71410 E 83.63915<br>N 19.73760 E 83.72767 |
| **Forest ranges falling within corridor** | Muniguda, Tumudibandha, Belghar, and Chandragiri ranges |
| **Revenue villages falling within corridor** | 214 |
| **Habitat type** | Tropical Dry deciduous Forest |
| **Major land use** | Forest, Agricultural land and settlements<br>Forest = 42489.2 Ha<br>Agriculture = 9000 Ha<br>Habitation = 3900 Ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 28 |
| **Major bottleneck** | Agricultural field found between Forest Blocks |
| **Linear infrastructure in the corridor** | 1) 7 km of State Highway 5<br>2) 18 km of High-tension power line ( 11 kv) |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat shall be improved with active cooperation of local people using sound Silvicultural techniques and mix plantation with raising of Fruit and Fodder species in the denuded land"<br>(b) Elephant proof trench is to be dug out to protect the agricultural crop and prevent Human Animal Conflict at a large.<br>(c) WHS in more number is to be dug out in the forest area to augment water during pinch Summer.<br>(d) Salt licks to be developed in the forest close to /river bank inside the dense forest.<br>e) Watch tower and other protection infrastructure to be strengthened. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



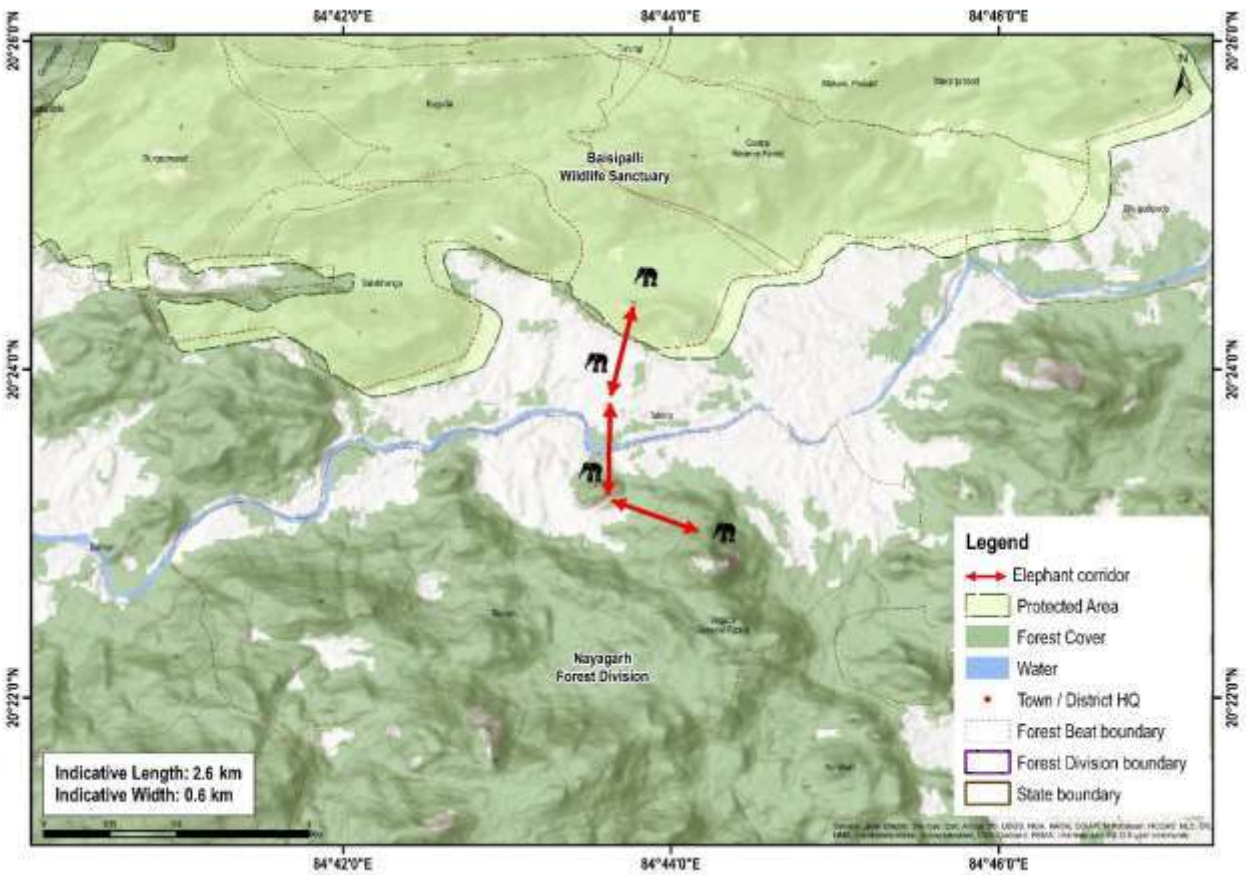
## 30. Badampahar - Dhobadhobin Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Badampahar Reserve Forest to Dhobadhobin Reserve Forest.** |
| **State** | Odisha and Jharkhand |
| **Indicative length and width** | Length = 16 km, width = 1.5 km |
| **Geo Coordinates** | N 22.02019 E 86.003795<br>N 22.33106 E 86.43209<br>N 22.08617 E 86.16170<br>N 22.33087 E 86.43185 |
| **Forest ranges falling within corridor** | Dudhiani, Karanjia, Bisnoi, Rairangpur and Badampahar Range |
| **Revenue villages falling within corridor** | 15 |
| **Habitat type** | Sal-dominated forest |
| **Major land use** | Forest, Agricultural land and settlements<br>Forest= 2000 ha. appx.<br>Agriculture= 1580 appx.<br>Habitation= 120 appx |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | 03 |
| **Major bottleneck** | Villages, National Highway 220 |
| **Linear infrastructure in the corridor** | 1) 1 km of National Highway-220<br>2) 3 km of High-tension power line |
| **Recommendations by the forest department to improve the corridor** | 1) Prevent forest fire with the help of VSS/Public<br>2) Make public aware about ill effect of loss of bio diversity and of threatened flora crimes.<br>3) Enforce provisions of the wildlife (Protection) Act 1972<br>4) Detail study of animal behavior & public participation in management<br>5) Creation of public awareness & public participation in management. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased |



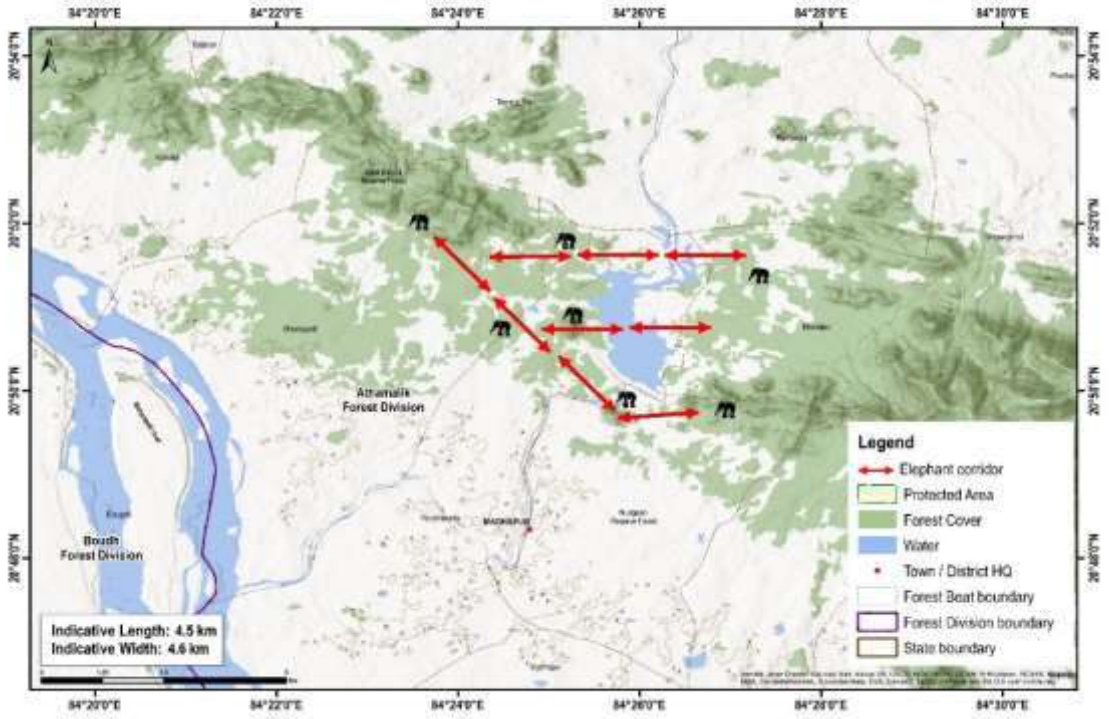
## 31. Buguda- Central Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Central Reserve Forest of Daspalla Range to Baisipalli Reserve Forest of Banigochha West Range of Mahanadi Wildlife Division Links Simlipal Tiger Reserve.** |
| **State** | Odisha |
| **Indicative length and width** | Length = 2.6 km, width = 0.8 km |
| **Geo Coordinates** | N 20.37986, E 84.72706<br>N 20.40438, E 84.72670. |
| **Forest ranges falling within corridor** | Daspalla and Banigochha West Range |
| **Revenue villages falling within corridor** | 1 |
| **Habitat type** | Northern and Southern dry mixed deciduous forest |
| **Major land use** | Agriculture, Settlement, River, Plantation(Cashew) |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 11 |
| **Major bottleneck** | 1) Passing of Brutanga river<br>2) NH57 is crossing through the corridor<br>3) Proposal for Construction of Khurdha- Balangir Railway line. |
| **Linear infrastructure in the corridor** | 1) Proposed railway line and canal (Brutanga Irrigation Project)<br>2) High-tension power line (33 KV), 4 km |
| **Recommendations by the forest department to improve the corridor** | Construction of ramp, watch tower, anti-poaching barrack, animal cross overs at specific locations. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



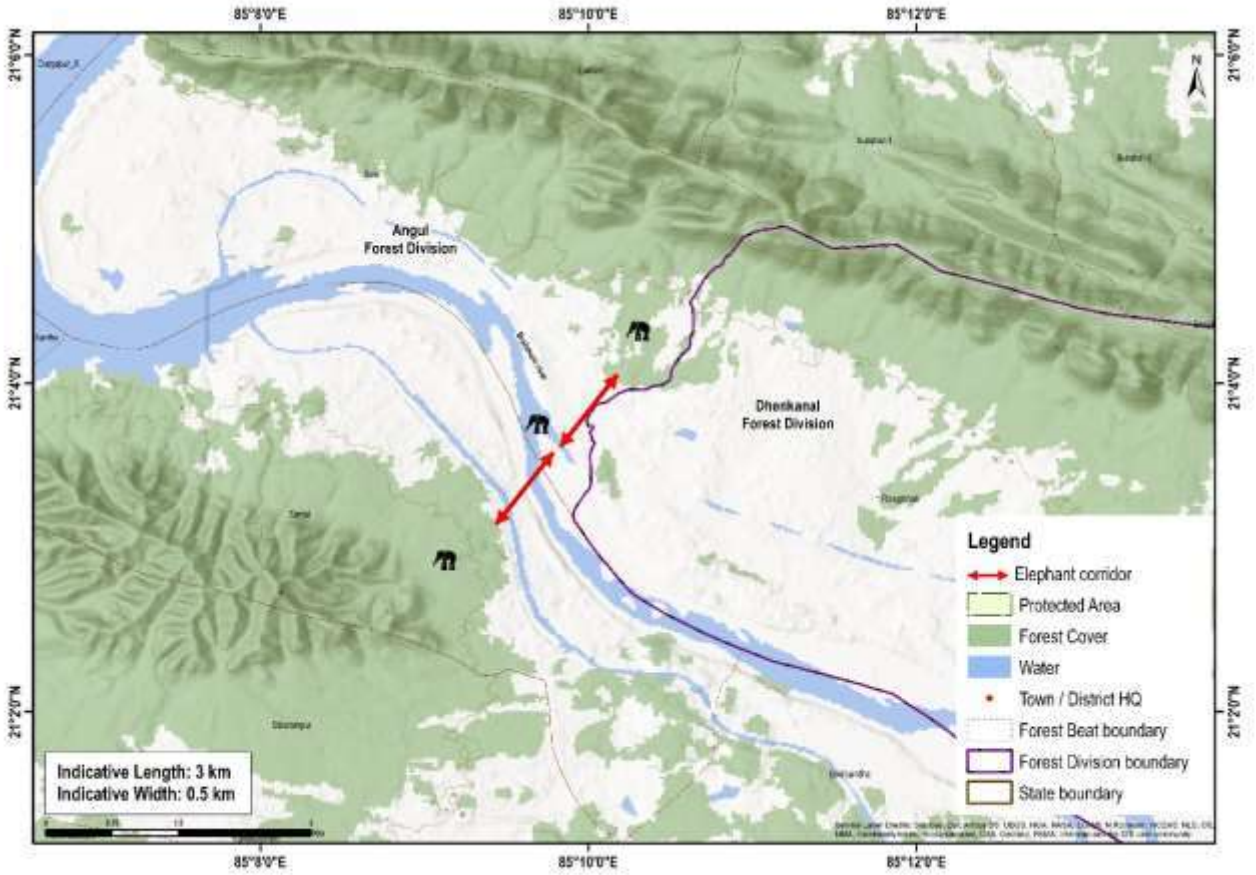
## 32. Nuagaon – Baruni Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Athmallik/ Nuagaon Reserve Forest to Baruni Reserve Forest /Angul** |
| **State** | Odisha |
| **Indicative length and width** | Length = 4.5 km, width = 4.6 km |
| **Geo Coordinates** | N 20. 83111, E 84.44200 |
| **Forest ranges falling within corridor** | Madhapur Range |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | It connects Mahanadi Elephant Reserve and Sambalpur Elephant Reserve by linking Satkosia Gorge Wildlife Sanctuary to Khalasuni Wildlife Sanctuary of Sambalpur Elephant Reserve, creating a large landscape complex for elephants |
| **Habitat type** | Dry deciduous forest, Sal dominated |
| **Major land use** | Forests, Agriculture and settlements<br>Revenue Forest = 75 Ha.<br>Forest land = 2000 Ha. |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 14 |
| **Major bottleneck** | None |
| **Linear infrastructure in the corridor** | 1) Bamur-Madhapur PWD Road and associated vehicular traffic, 5 km<br>2) Manjore Dam Left canal and Right canal with concrete embankment, 3.5 km<br>3) High-tension power line (11 KV), 1.5 KM<br>4) Government Establishment of Manjore Irrigation Project, 4 ha |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the State Forest Department and legally protected under appropriate law to prevent encroachment, diversion of forest land for non-forestry activities and developmental activities in the corridor critical to animal movement.<br>2) In consultation with the villagers, the identified land near Manarbeda and Patrapada village should be secured.<br>3) Construction should be avoided in the areas downstream of the Manjore Dam, especially in the forest fringe.<br>4) Notification of the Khesra Forest in the corridor area as Reserve Forest.<br>5) Ensure that illegal felling of tree and collection of stone is stopped.<br>6) Establishment of new stone crushers should not be allowed at least 500 Mtr from the area (Near the Dam). |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



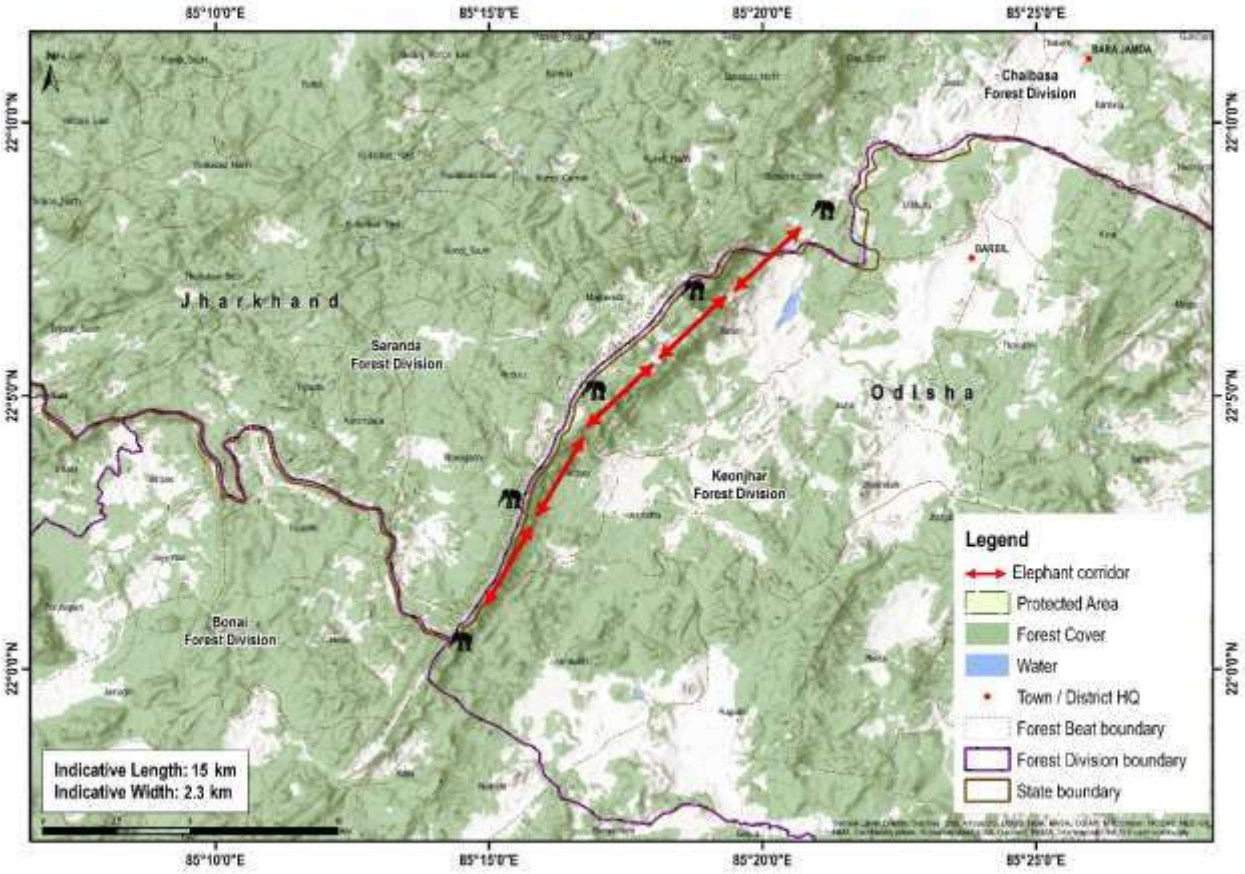
## 33. Kanheijena- Anantapur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Angul Forest Division- Dhenkanal Forest Division** |
| **State** | Odisha |
| **Indicative length and width** | Length = 3 km, width = 0.5 km |
| **Geo Coordinates** | N 21.04833, E 85.15555<br>N 21.07388, E 85.18472 |
| **Forest ranges falling within corridor** | Talcher and Mahabir Road Range |
| **Revenue villages falling within corridor** | 8 |
| **Habitat type** | Tropical Dry Deciduous Forest |
| **Major land use** | Agricultural land, river and settlements |
| **Elephant movement status** | Seasonal and Occasional |
| **No. of elephants using the corridor** | Angul Division - 40<br>Dhenkanal Division - 165 |
| **Major bottleneck** | Canals, Highways, Brick kilns, Industries and Factories |
| **Linear infrastructure in the corridor** | 1) National Highway 23<br>2) State Highway<br>3) 2 km of Rengali irrigation canal with concrete embankment |
| **Recommendations by the forest department to improve the corridor** | 1) Bridge along the Brahmani river and Rengali canals.<br>2) Protection to adjoining forest areas from industrialization. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



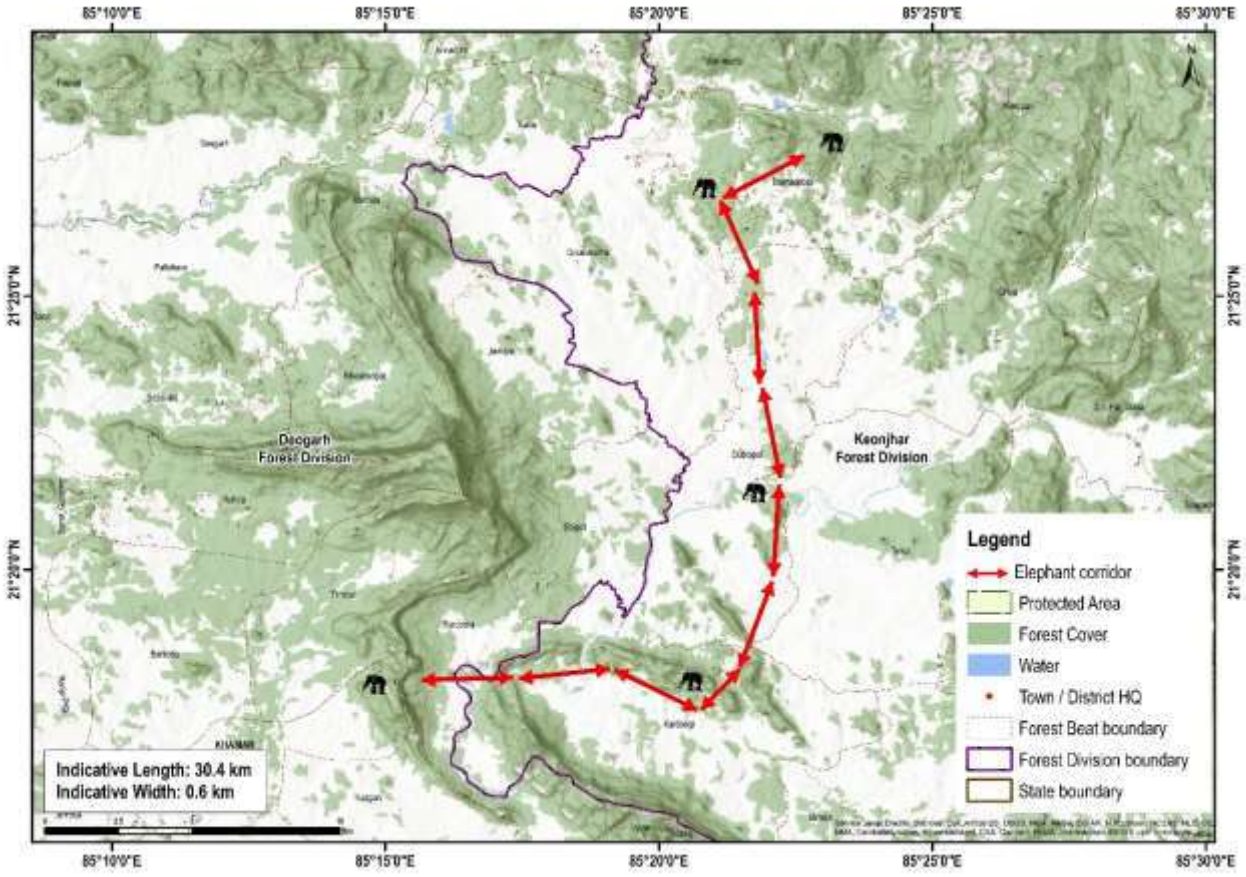
## 34. Karo - Karampada Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Karo Reserve Forest to Karampada Reserve Forest** |
| **State** | Odisha |
| **Indicative length and width** | Length = 15.17 km, width = 2.3 km |
| **Geo Coordinates** | N 22$^0$ 00' 20.2" E 85$^o$ 14' 41.7"<br>N 22$^0$ 07' 41.1" E 85$^o$ 16' 25.5" |
| **Forest ranges falling within corridor** | Barbil Range |
| **Revenue villages falling within corridor** | 0 |
| **Habitat type** | Sal dominated dry deciduous forest |
| **Major land use** | Forest, 1588.88 ha |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | Bolani Mines of SAIL |
| **Linear infrastructure in the corridor** | 1) Mine roads, 2 km<br>2) Factory, 50 ha |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



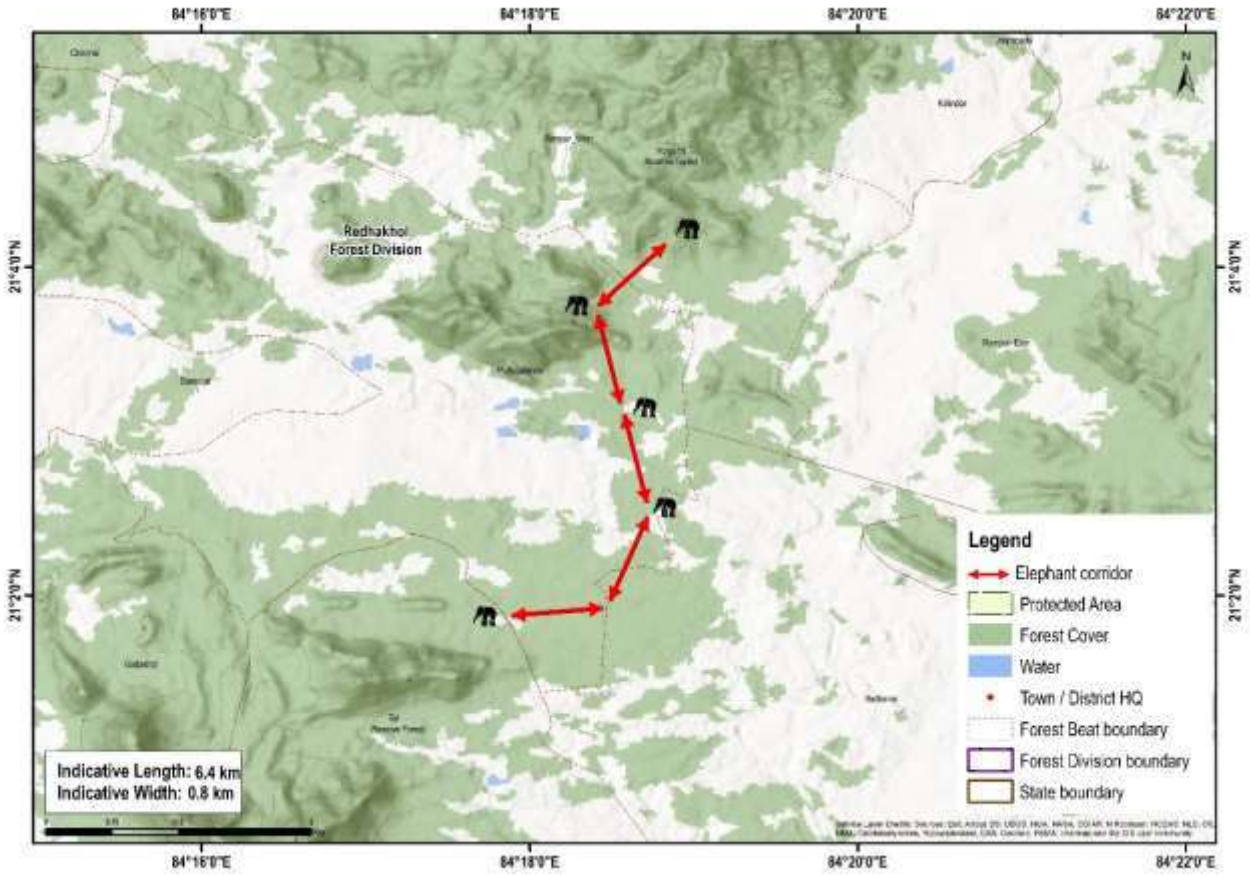
## 35. Telkoi - Pallahara Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Telkoi Reserve Forest to Khamar Reserve Forest** |
| **State** | Odisha |
| **Indicative length and width** | Length = 30.4 km, width = 0.6 km |
| **Geo Coordinates** | N 22$^0$27' 22.8" E 85$^0$ 22' 16.7" |
| **Forest ranges falling within corridor** | Saleikena-Siriabahal-Kalapohari RF, Samakoi RF, Mankadachua RF, Tungurubahal DPF, Dobalapal PRF, Dhinkeswari DPF & Kakudiamba DPF |
| **Revenue villages falling within corridor** | 12 |
| **Ecological importance** | Important corridor for connecting population of Telkoi Reserve Forest to Khamar Reserve Forest |
| **Habitat type** | Mixed deciduous Forest dominated by Sal |
| **Major land use** | Revenue land and Agriculture<br>Forest = 579.2 ha<br>Agriculture= 747.7 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | Human settlement, Agriculture field & Road |
| **Linear infrastructure in the corridor** | 1) 150m of National Highway 49<br>2) Hight tension power line, 220 KV = 400 mtr, at Banspal and 220 KV= 500 mtr at Lokanathpur |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



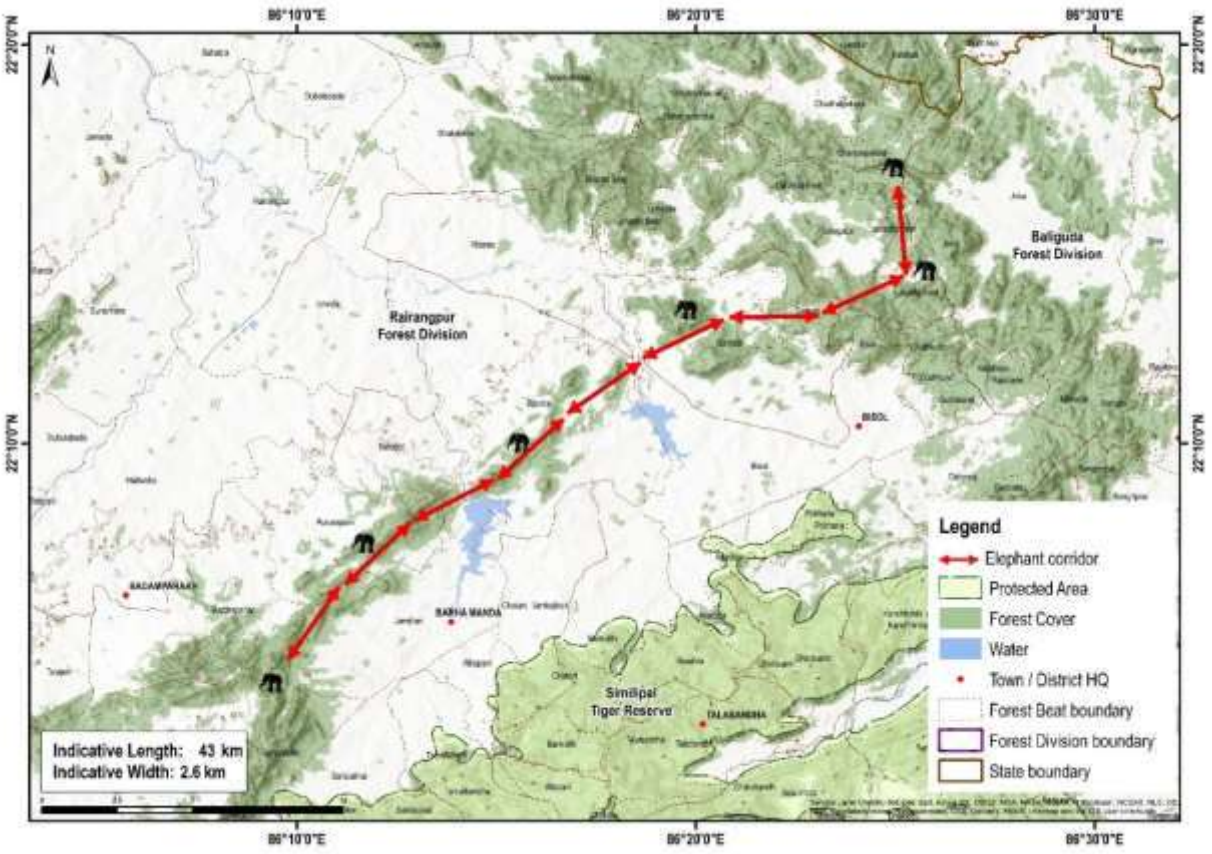
## 36. Tal - Kholgarh Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Tal Reserve Forest of Badbahal Range to Kholgarh Reserve Forest of Redhakhol Range** |
| **State** | Odisha |
| **Indicative length and width** | Length = 6.4 km, width = 0.8 km |
| **Geo Coordinates** | N 21$^0$ 03' 51.", E 84$^0$19'2.29"<br>N 20$^0$55' 21.8" E 84$^0$16'13.12" |
| **Forest ranges falling within corridor** | Badbahal Range and Redhakhol Range |
| **Revenue villages falling within corridor** | 4 |
| **Habitat type** | Soil dominated mixed deciduous forests |
| **Major land use** | Forest, Agricultural land and Settlements |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | 1) National Highway- 55<br>2) Angul to Sambalpur Railway line |
| **Linear infrastructure in the corridor** | 1) 1.3 km of National Highway- 55<br>2) 1.2 km double track & electrified railway track |
| **Recommendations by the forest department to improve the corridor** | The corridor area needs specific legal attention like in PAs is protected by the strength of Forest and Wildlife laws. The legal implications are to be very specific regarding the developmental interventions emphasizing the protection of the animal along with its habitat. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



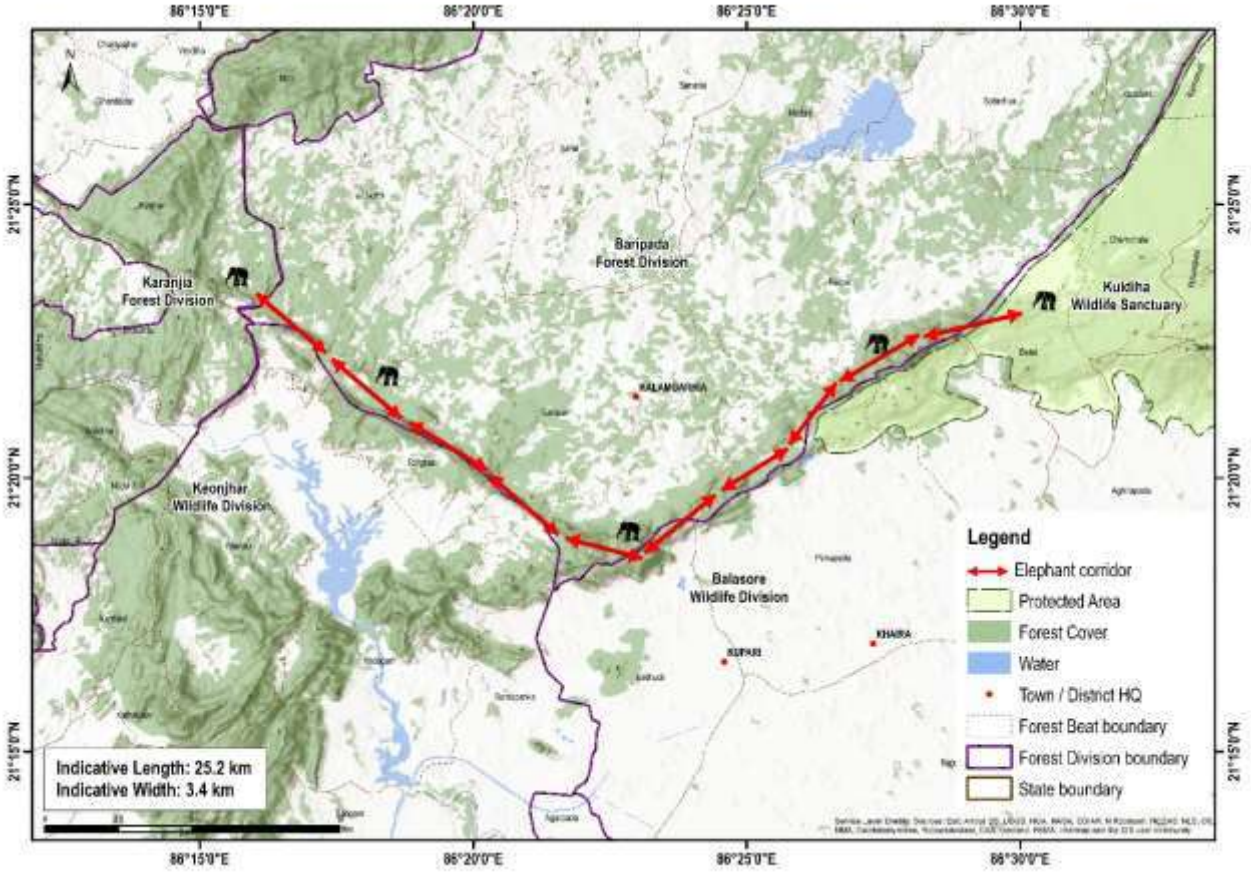
## 36. Badampahar - Karida East Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Badampahar Reserve Forest to Dhusura Reserve Forest** |
| **State** | Odisha and Jharkhand |
| **Indicative length and width** | Length = 43 km, width = 2.6 km |
| **Geo Coordinates** | N 22.05198, E 86.09086<br>N 22.06586, E 86.98804<br>N 22.05197, E 86.09084 |
| **Forest ranges falling within corridor** | Badampahar Range, Bisoi WL Range, Rairangpur Range, Mushabani Range |
| **Revenue villages falling within corridor** | 4 |
| **Habitat type** | Soil dominated mixed deciduous forests |
| **Major land use** | Forest, Agricultural land and settlements<br>Forest= 2000 ha<br>Agriculture= 1580 ha<br>Habitation= 120 ha |
| **Elephant movement status** | Seasonal and occasional |
| **No. of elephants using the corridor** | 7 |
| **Major bottleneck** | 1) Khadakhai Dam and its feeder Irrigation Canal<br>2) State Highway-50 |
| **Linear infrastructure in the corridor** | Irrigation canal |
| **Recommendations by the forest department to improve the corridor** | 1) Prevent forest fire with the help of VSS/Public<br>2) Make public aware about ill effect of loss of bio diversity and of threatened flora crimes.<br>3) Enforce provisions of the wildlife (Protection) Act 1972<br>4) Detail study of animal behavior & public participation in management<br>5) Creation of public awareness & public participation in management |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



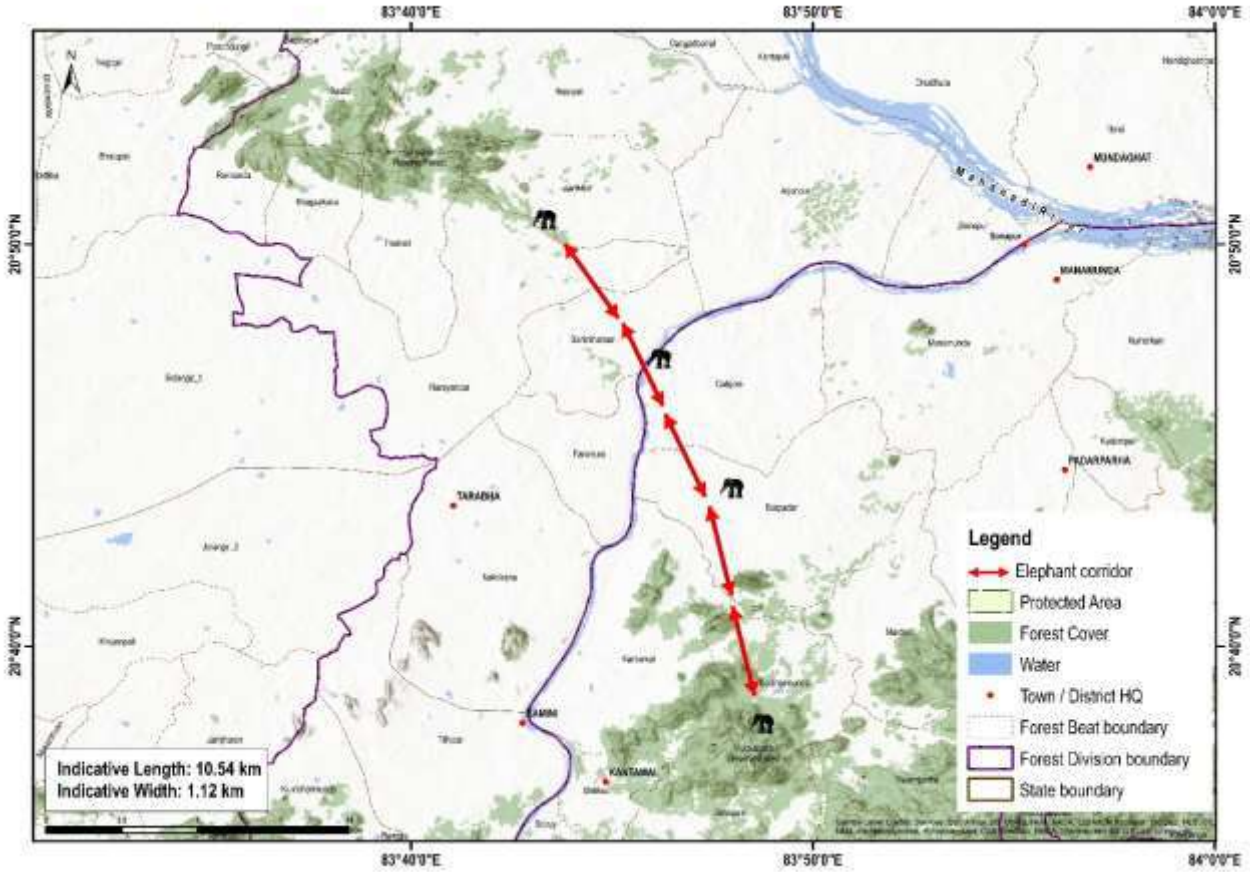
## 37. Similipal - Hadgarh Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Similipal Wildlife Sanctuary to Hadgarh Wildlife Sanctuary through Kuldiha Wildlife Sanctuary. The entire corridor has been declared as a Conservatio Reserve under the Wildife (Protection) Act, 1972** |
| **State** | Odisha |
| **Indicative length and width** | Length = 25.2 km, width = 3.4 km |
| **Geo Coordinates** | 21.3707 N 86.22472 E |
| **Forest ranges falling within corridor** | Satkosia wildlife Range |
| **Revenue villages falling within corridor** | 21 |
| **Habitat type** | Soil dominated dry deciduous forests |
| **Major land use** | Forests |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | Information NA |
| **Linear infrastructure in the corridor** | None |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants constant. |



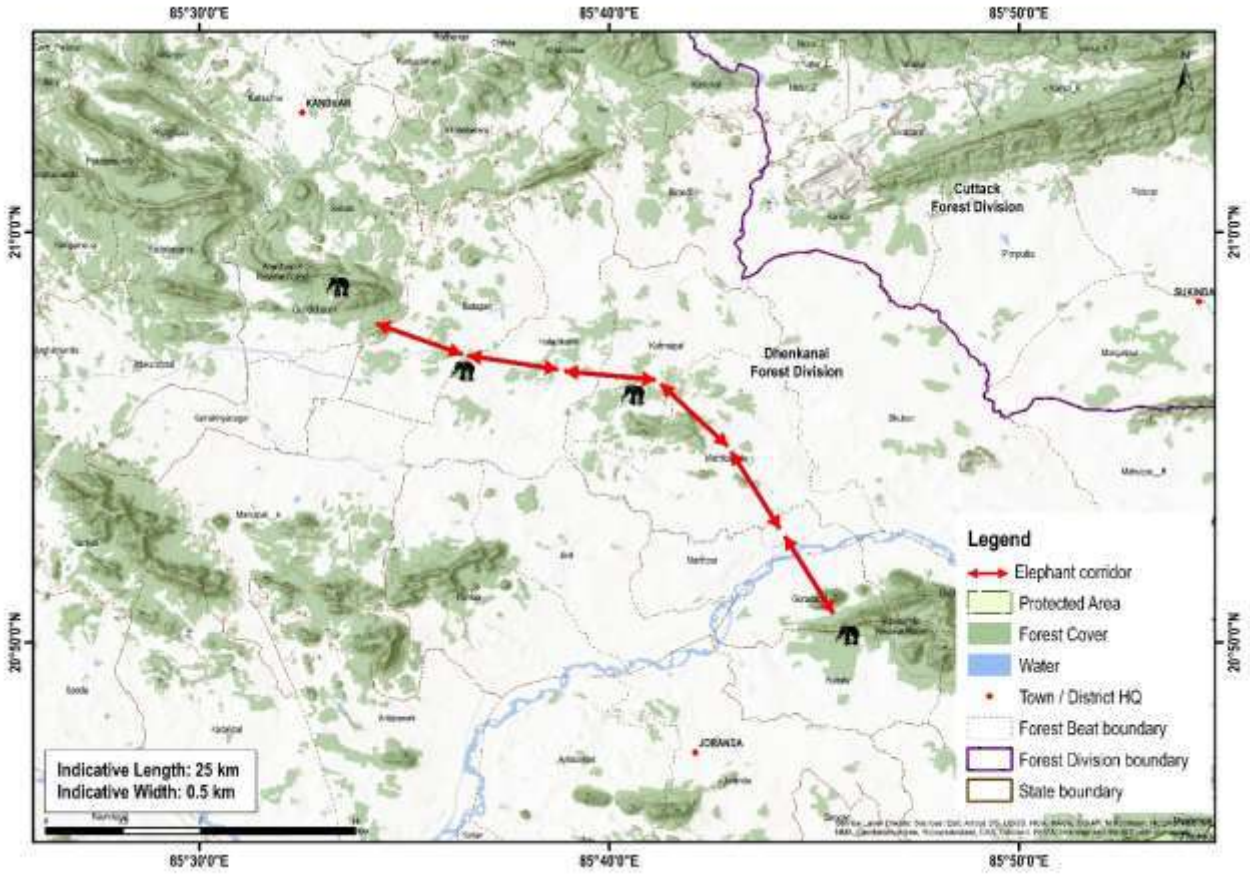
## 38. Barapahad - Tarva - Kantamal Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Barapahad Reserve Forest (Sonepur range) to Putputigarh Reserve Forest (Kantamal Range) of Boudh Division** |
| **State** | Odisha |
| **Indicative length and width** | Length = 10.5 km, width = 1.1 km |
| **Geo Coordinates** | N 20° 50' 40.20", E 83° 42' 48.09"<br>N 20° 46 14.86", E 83° 45 51.93" |
| **Forest ranges falling within corridor** | Sonepur and Kantamal Ranges |
| **Revenue villages falling within corridor** | 22 |
| **Habitat type** | Dry deciduous forest |
| **Major land use** | Forest = 295.43 ha<br>Agriculture = 467.66 ha<br>Habitation = 5.71 ha<br>River Suktel = 97.12 ha |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | Construction of NH-57, Absence of contiguity in the Forest covers between two habitats, sporadic human settlement in the corridor area. |
| **Linear infrastructure in the corridor** | 1) National Highway- 57<br>2) Broad Gauge / Electrified (KHU-BGR Railway Line)<br>3) Two HT (132KV) power lines from Meramunduli to Damanjodi for about 0.70 KM<br>4) 4.21 ha of Sheetal Industries (Kharjura). |
| **Recommendations by the forest department to improve the corridor** | 1) Plantation of fruit and fodder trees in the degraded reserve forest.<br>2) Creation of water body inside Barapahad RF & Bahirkhaman RF.<br>3) Cabling of transmission lines inside the corridor area. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



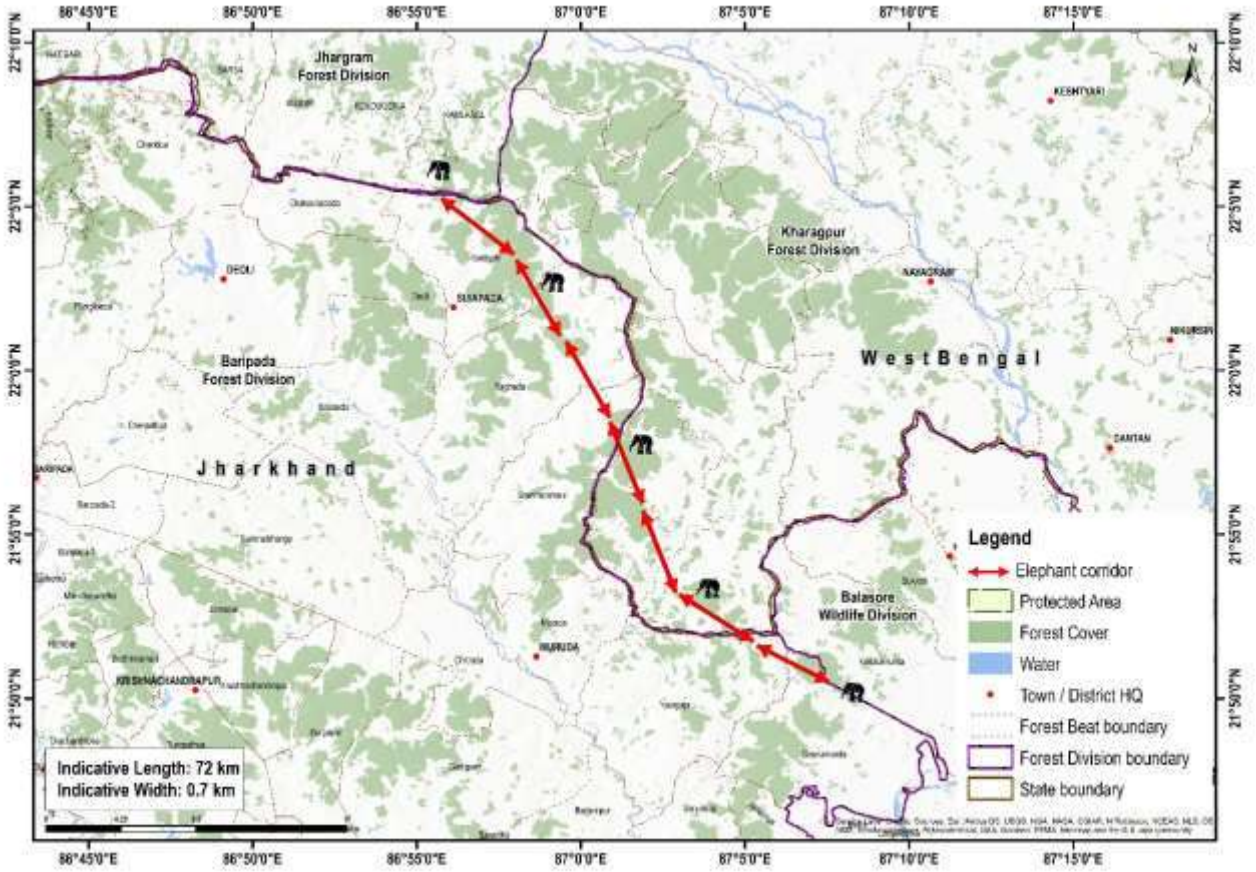
## 39. Maulabhanja - Jiridamali – Anantapur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the K. Nagar East Range to K. Nagar West Range connecting the Anantpur Reserve Forest of Dhenkanal Division & Kapilash Wildlife Sanctuary** |
| **State** | Odisha |
| **Indicative length and width** | Length = 6.5 km, width = 1 km |
| **Geo Coordinates** | N- 20º-50'-19", E- 85º-34'-32"<br>N- 20º-59'-29", E- 85º-46'-17" |
| **Forest ranges falling within corridor** | K.Nagar East and K.Nagar West Range |
| **Revenue villages falling within corridor** | 20 |
| **Habitat type** | Sal-dominated tropical dry deciduous forest. |
| **Major land use** | Forest = 65 ha<br>Agriculture= 60 ha<br>Habitation= 30 ha |
| **Elephant movement status** | Occasional |
| **No. of elephants using the corridor** | Not recorded by forest department |
| **Major bottleneck** | Irrigation Canal NH- 200 connecting Talcher & Chandikhol |
| **Linear infrastructure in the corridor** | 1) National Highway- 200, 20 km<br>2) Rengali Canal, 10 km |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



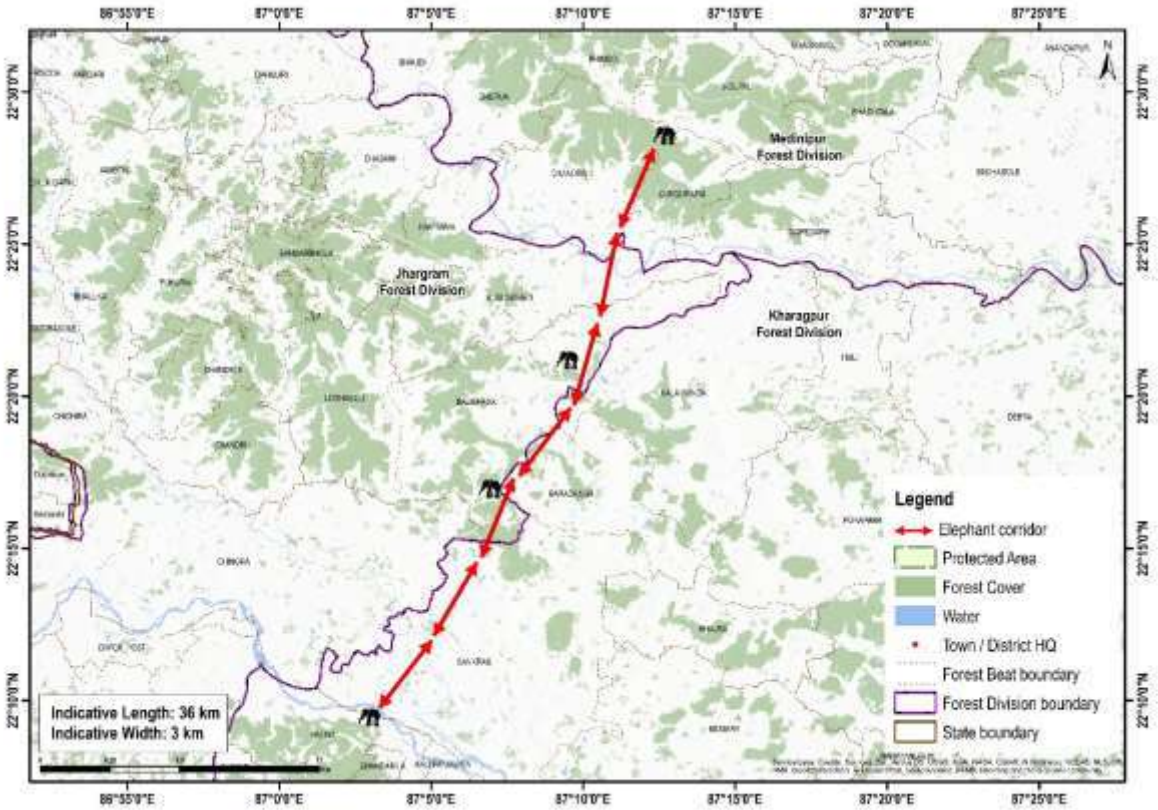
## 40. Deuli – Suliapada (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **Earlier the elephant movement was observed from Deuli to Suliapada in Deuli Range of Baripada Forest Division. Lately, the elephant movement has been shifted to Rasgobindpur and Betnoti Ranges, all the way up to Nilagiri outside Kuldiha Wildlife Sanctuary.** |
| **State** | Odisha |
| **Indicative length and width** | Length = 72 km, width = 0.7 km |
| **Geo coordinates** | N- 22 05 26.4 E- 86 55 22.6<br>N- 21 50 36.4 E- 87 07 17.7 |
| **Forest ranges falling within corridor** | Rasgovindpur and Betnoti Range |
| **Revenue villages falling within corridor** | 238 |
| **Habitat type** | Sal-dominated secondary deciduous forests. |
| **Major land use** | Forest = 5264.82 ha<br>Agriculture = 30525.00 ha<br>Habitation = 1947.37 ha |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | None |
| **Bottleneck in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Impaired. The corridor is seldom used by elephants. |



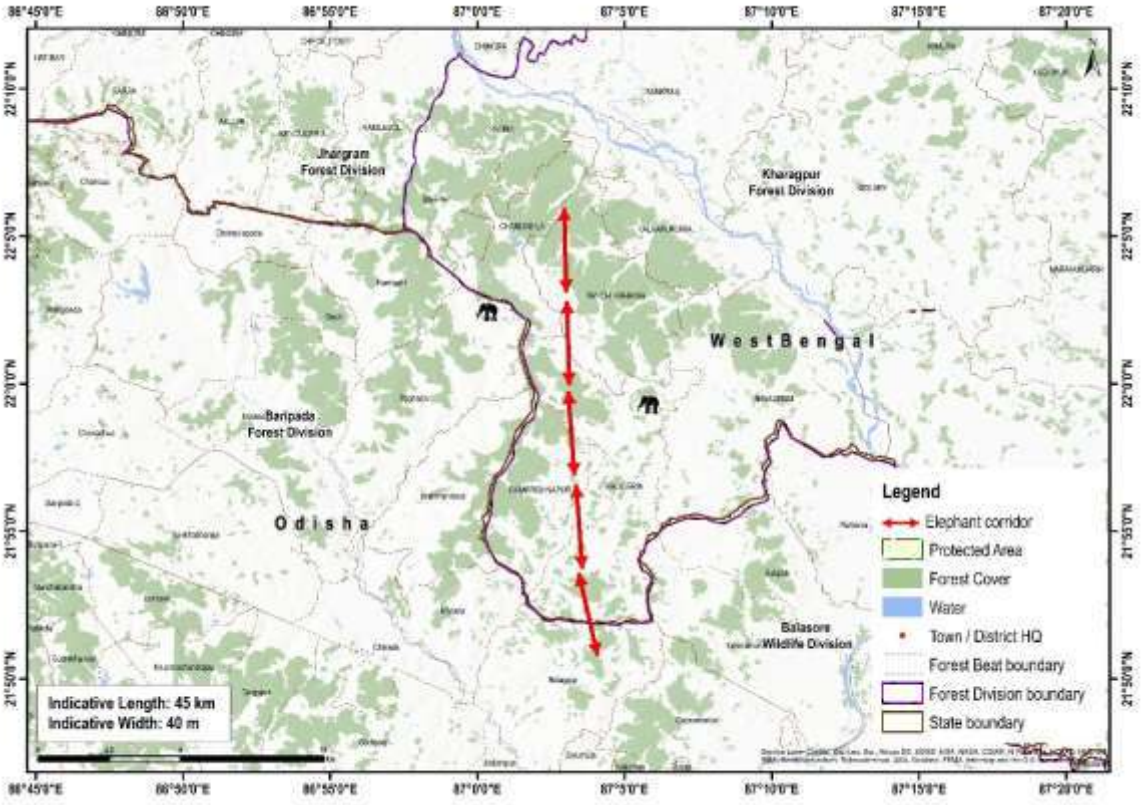
## 41. Kalikunda-Chandra through Manikpara Corridor

| | |
|---|---|
| **Connectivity** | **The corridor links Kalaikunda to Manikpara range in Kharagpur Forest Division, passing through Chandra Range** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 36 km, width = 6 – 40 m |
| **Geo coordinates** | 22.33562459, 87.16449294<br>22.15879933, 87.05297854 |
| **Compartments falling within corridor** | Sankrail, Jhargram and Kharagpur 1 Block |
| **Forest ranges falling within corridor** | Kalaikunda, Manikpara and Chandra range |
| **Revenue villages falling within corridor** | 65 |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forest = 100 ha<br>Agriculture = 150 ha<br>Habitation = 50 ha |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | 1) National Highway- 6. 3 km of the road passes through the corridor<br>2) Broad- gauge, double track electrified railway track, 0.5 km<br>3) Kangsabati irrigation canal with concrete embankment, 5 km<br>4) High tension power line (33KV), 2 km<br>5) Elephant Proof Trench- 3 km<br>6) Kodopal eco-tourism and solar project |
| **Major bottleneck** | Private plots between the river and forest along the Medinipur to Jhargram road. |
| **Recommendations by the forest department to improve the corridor** | 1) Improvement of habitat in the corridor area<br>2) Recruitment of frontline staff, wildlife squads and trackers.<br>3) Increase in the amount of compensation for crop or hut damage.<br>4) Providing street light for better visibility around the village on all roads. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



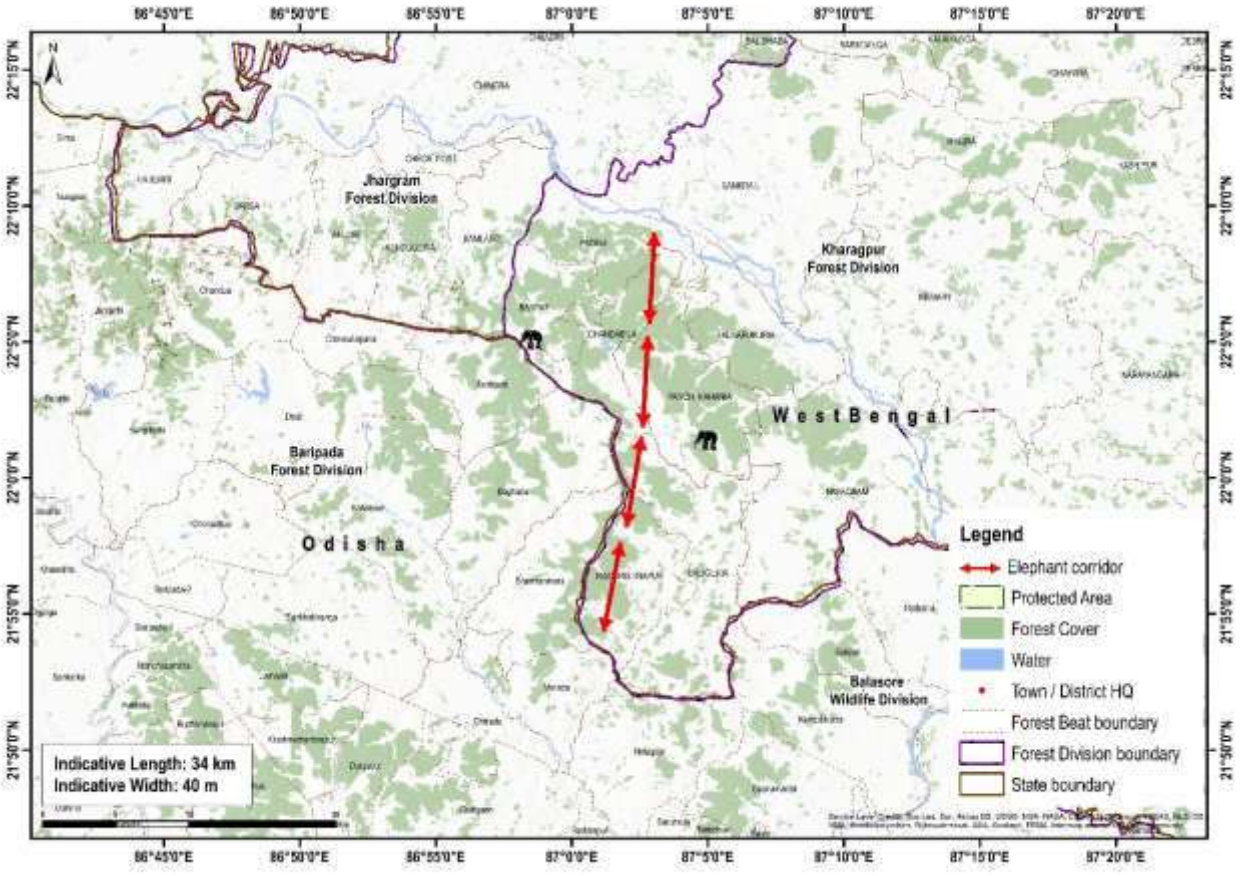
## 42. Nayagram - Jamboni through keshorrekha Corridor

| | |
|---|---|
| **Connectivity** | **The corridor links Kalaikunda to Manikpara range in Kharagpur Forest Division, passing through Chandra Range** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 45 km, width = 40 m |
| **Geo coordinates** | 22.108739 / 87.047986<br>21.865306 / 87.067815 |
| **Compartments falling within corridor** | Khasjungle 76-Rangium, Baksol, Ghoratulia, Dokra, Patharband, Damdasol, Satpatia, Banskhali, Khasjungle 325, Jamboni, Jhaurishol |
| **Forest ranges falling within corridor** | Nayagram and Keshorrekha range |
| **Revenue villages falling within corridor** | 35 |
| **Administrative details of the corridor** | Nayagram block |
| **Ecological importance** | This corridor provides easy movement for elephants through the fragmented forests of Kharagpur Division |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forest<br>Agricultural land<br>Settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) State Highway- 9: 4km of the road passes through the corridor<br>2) Jambhira irrigation dam and canal with concrete embankment, 25 km<br>3) High tension power line (33KV), 2 km<br>4) Elephant Proof Trench- 9 km |
| **Recommendations by the forest department to improve the corridor** | 1) Improvement of habitat in the corridor area<br>2) Providing monitoring vehicle for the frontline staff<br>3) Increase in the amount of compensation for crop or hut damage.<br>4) Providing street light for better visibility around the village on all roads. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



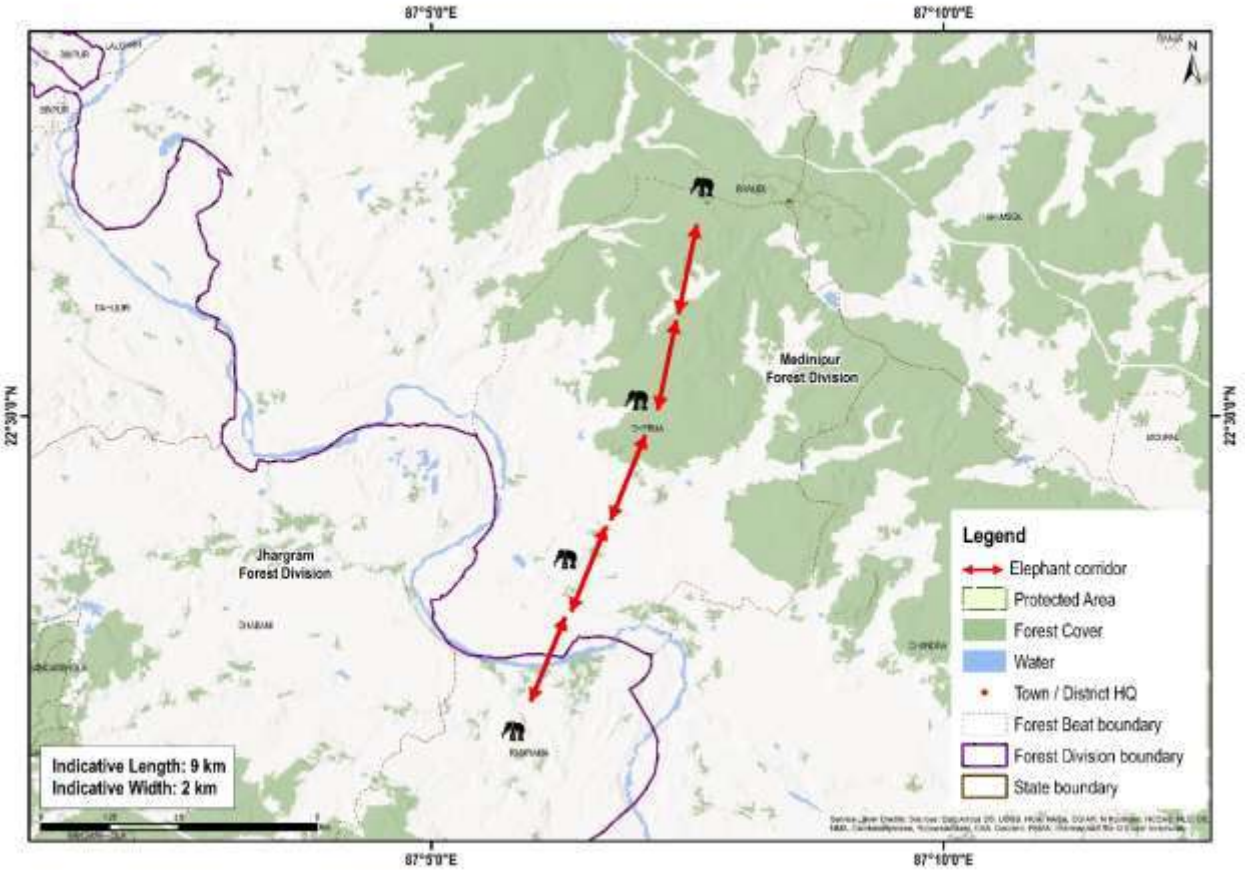
## 43. Chandabila Tapoban- Dhumsi through Keshorrekha Corridor

| | |
|---|---|
| **Corridor name** | **Chandabila Tapoban- Dhumsi through Keshorrekha**. |
| **State** | West Bengal |
| **Connectivity** | This corridor links Chandabila range in Kharagpur Division to Dhumsai range in Kharagpur Forest Division, passing through keshorrekha Range |
| **Indicative length and width** | Length = 34 km, width = 40 m |
| **Geo coordinates** | 22.158799 / 87.052978<br>21.897336 / 87.017596 |
| **Compartments falling within corridor** | Deulbar, Tiakati, Khasjungle 11, Tapoban, Ataldiha, Dulki, Raisol, Khasjungle 96, Pathrasol, Madhupua, Lakhaidihi, Bhalukbasa, Ramkrishnapur, Dhumsai |
| **Forest ranges falling within corridor** | Nayagram, Keshorrekha ranges |
| **Revenue villages falling within corridor** | 35 |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forests, Agricultural land and Settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) 2 km of State Highway-9 passes through the corridor<br>2) 25 km of Jambhira irrigation dam and canal with concrete embankment<br>3) 9 km long trench from Bhalukbasa to Bonisal along the West Bengal and Odisha boundary<br>4) 3 km of tourism impacts at Tapoban Ashram and Rameswar temple |
| **Recommendations by the forest department to improve the corridor** | 1) Improvement of habitat in the corridor area<br>2) Providing monitoring vehicle for the frontline staff<br>3) Increase in the amount of compensation for crop or hut damage.<br>4) Providing street light for better visibility around the village on all roads |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



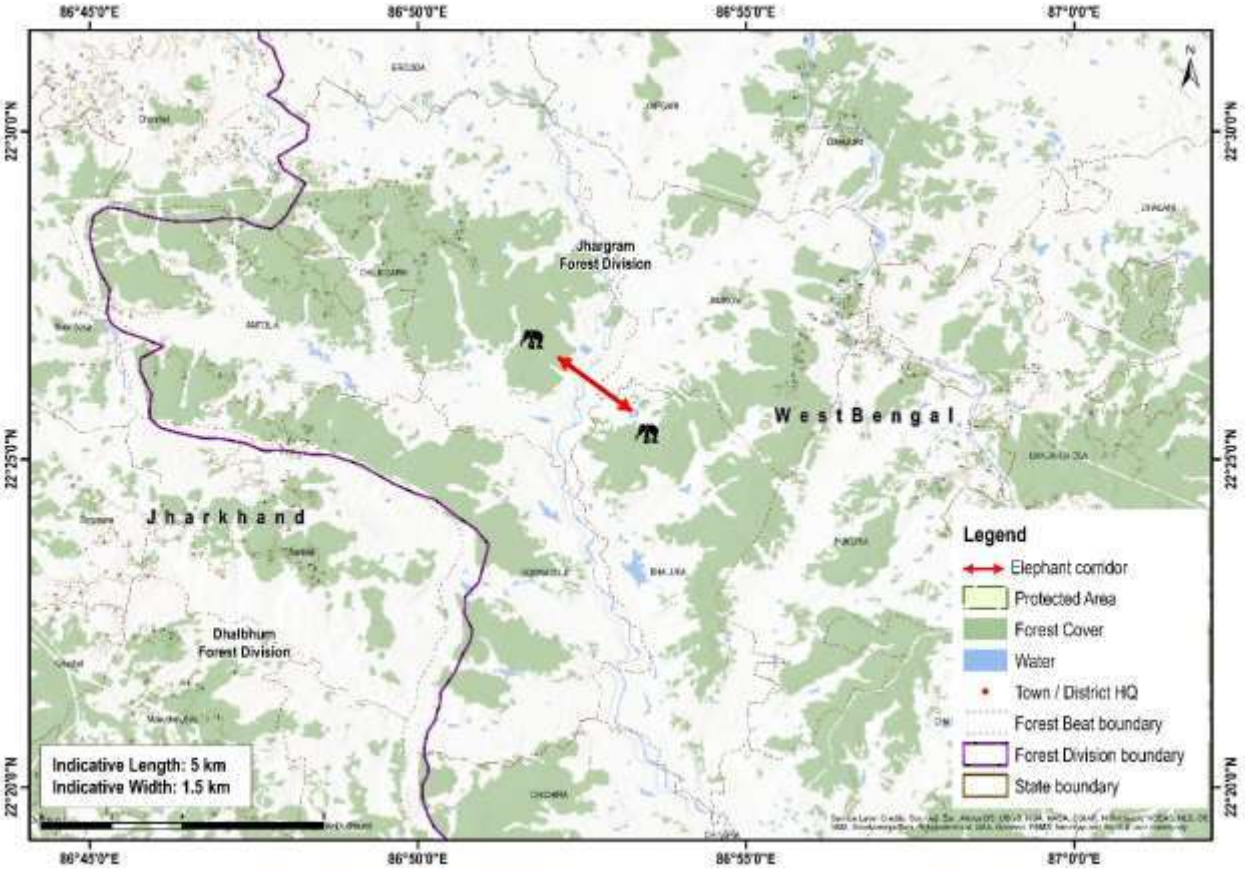
## 44. Kalaikunda- Chandra through Satpadi Ghat Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Manikpara range of Jhargram division to Chandra range of Medinipur division** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 9 km, Width = 2 km |
| **Geo coordinates** | 22º27'42.44" N / 87º 6' 5.72" E<br>22º31'53.92" N / 87º 7' 35.50" E |
| **Forest ranges falling within corridor** | Manikpara and Chandra range |
| **Revenue villages falling within corridor** | 12 |
| **Ecological importance** | This corridor provides easy movement for elephants through the fragmented forests between Kharagpur and Medinipur Division |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forests, Agricultural land and Settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) 2 km of State highway 9 passes through the corridor<br>2) Kangsabati canal with concrete embankment, 1 km<br>3) High tension power line, 440 v |
| **Major bottleneck** | Barriers along the private plot between river and forest. High traffic in the Medinipur to Jhargram road. |
| **Recommendations by the forest department to improve the corridor** | 1) Construction of earthen dam<br>2) Plantation of fodder species<br>3) Providing street light for better visibility around the village on all roads |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



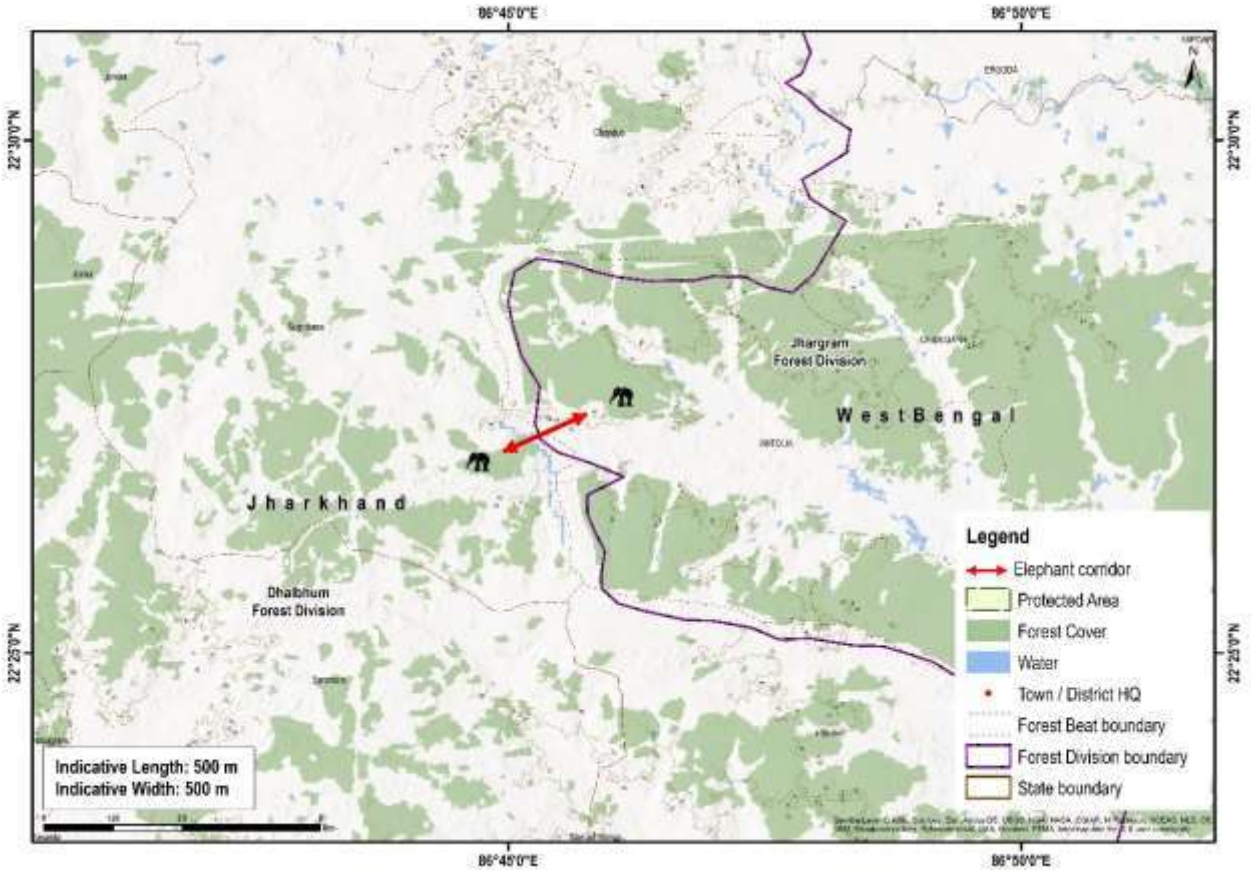
## 45. Gidhni- Jamboni Corridor

| | |
|---|---|
| **Connectivity** | **Connects Gidhni range (Satighat)of Jhargram division to Jamboni range of Jhargram division. Elephants move from Gidhni Range (Satighata) to Jhargram Range (Pukuria beat) crossing Dulung River, Dhaniapal, Bhaluka, and Kumri.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 5 km, width = 1.5 km |
| **Geo coordinates** | 22º 26' 3.63" N, 86º 52' 53.57" |
| **Compartments falling within corridor** | Satighata, Pukuria, Dhaniapal, Baraghong, Bhaluka, Banksole, and Kumri |
| **Forest ranges falling within corridor** | Gidhni and Jamboni range |
| **Revenue villages falling within corridor** | 8 |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forest = 600 ha<br>Agriculture = 200 ha<br>Habitation = 2 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1.5 km of village road |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



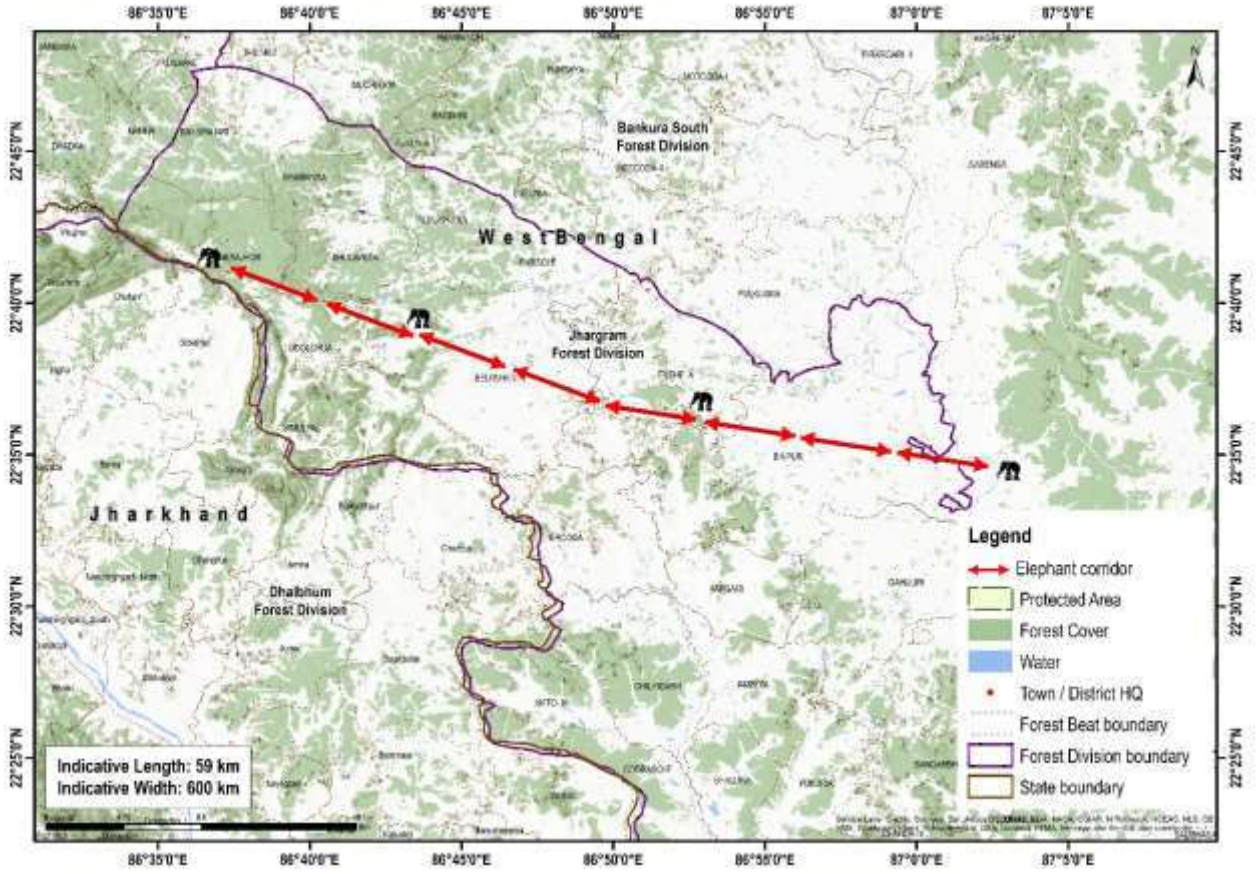
## 46. Chandua- Joka Corridor

| | |
|---|---|
| **Connectivity** | **This corridor facilitates movement from Chandua in West Bengal to Deoshole in Jharkhand** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 500 m, width = 500 m |
| **Geo coordinates** | 22º 27.323" N, 86º 45.753" E |
| **Forest ranges falling within corridor** | Gidhni range |
| **Revenue villages falling within corridor** | Two |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forest = 80 ha<br>Agriculture = 100 ha<br>Habitation = 5 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



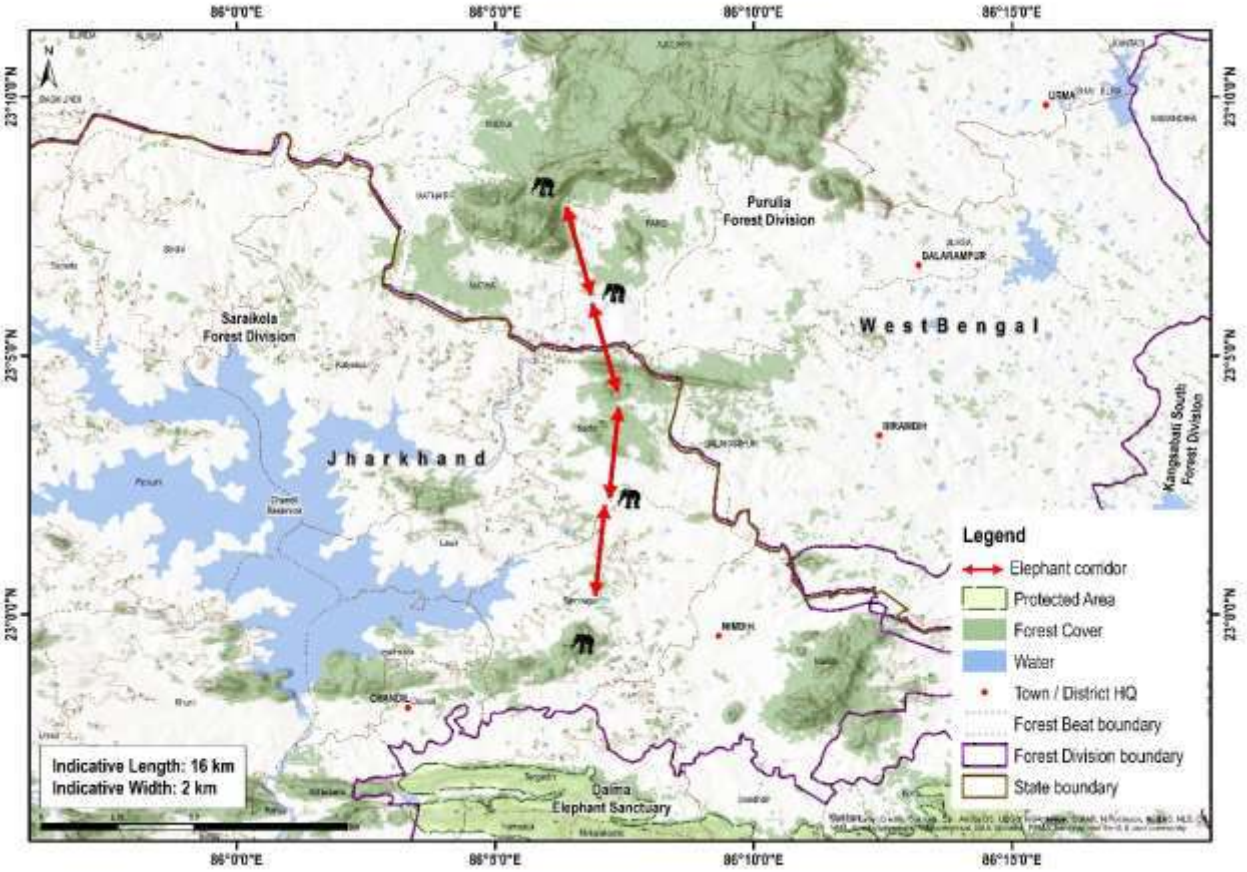
## 47. Kankrajhore- Lalgarh Corridor

| | |
|---|---|
| **Connectivity** | **Bhulaveda, Belpahari and Silda ranges to lalgarh range** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 59 km, width = 600 m |
| **Geo coordinates** | N 22º41'22.37", 22º35'05.80"/ E 86º 37'0.17", 87º01'50.80" |
| **Forest ranges falling within corridor** | Bhulaveda, Belpahari and Silda Ranges |
| **Revenue villages falling within corridor** | 25 |
| **Habitat type** | Tropical dry deciduous |
| **Major land use** | Forest = 1300 ha<br>Agricultural = 900 ha<br>Habitation = 200 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) State highway: 12 km<br>2) Kangsabati canal with concrete embankment: 12 km |
| **Recommendations by the forest department to improve the corridor** | 1) Improvement of habitat in the corridor area<br>2) Providing monitoring vehicle for the frontline staff<br>3) Plantation of fodder species |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



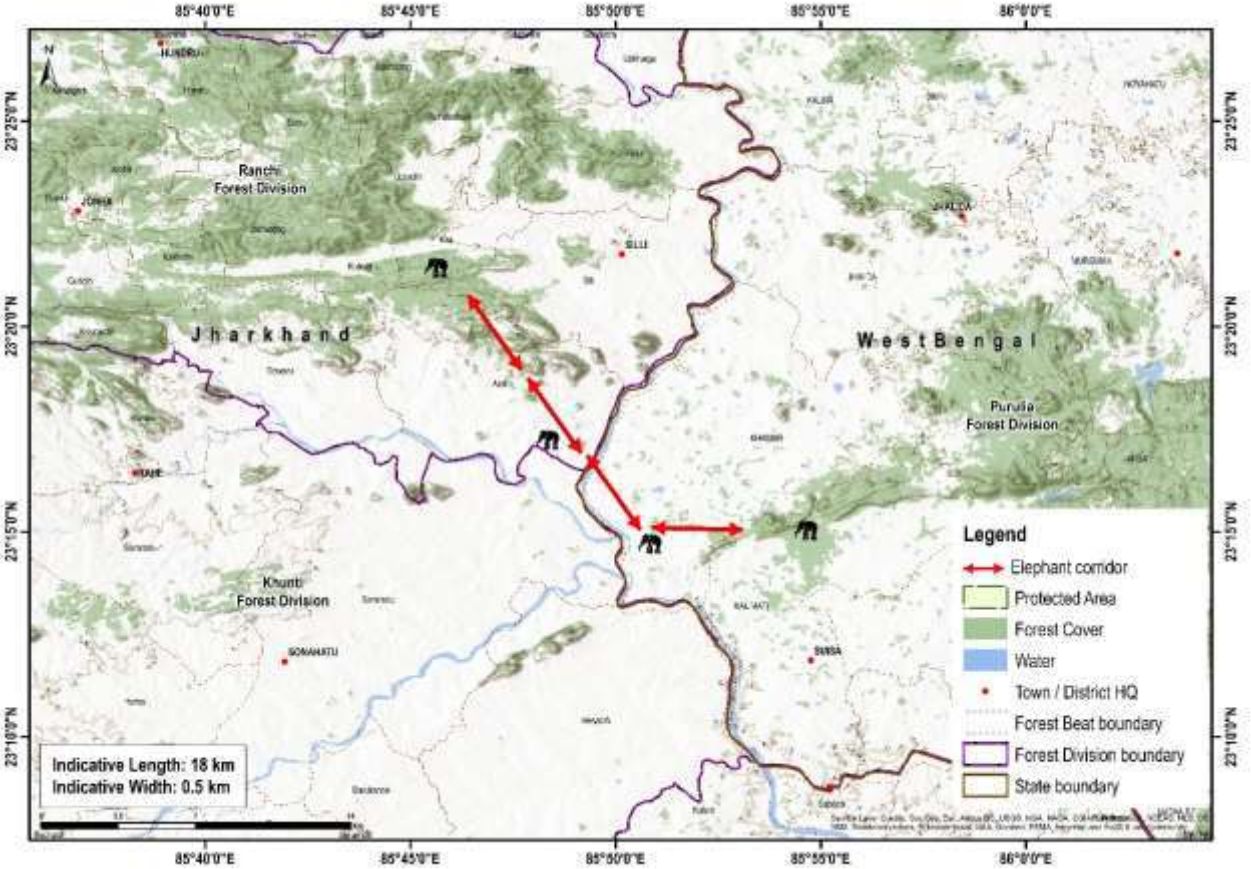
## 48. Chandil- Matha Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Chandil Range of Saraikela Forest Division with Matha Range of Purulia Forest Division.** |
| **State** | West Bengal and Jharkhand |
| **Indicative length and width** | Length = 16 km, Width = 2 km |
| **Geo coordinates** | 22°59'32" N, 86°5'56" E to 23°8'4" N, 86°8'22" E |
| **Forest ranges falling within corridor** | Chandil and Matha Range |
| **Revenue villages falling within corridor** | 20- 22 |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Forest= 10200.57 ha<br>Agriculture= 120 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using this corridor** | Not recorded by forest department |
| **Major Bottleneck** | Non forest land |
| **Linear infrastructure in the corridor** | 1) State Highway 4 and associated traffic<br>2) High Tension power line (1100 v) |
| **Recommendations by the forest department to improve the corridor** | 1) Notification of the corridor and its legal protection<br>2) Habitat restoration of the degraded forests in Kadla, Burudih, Chatarma and Digardih protected forests. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



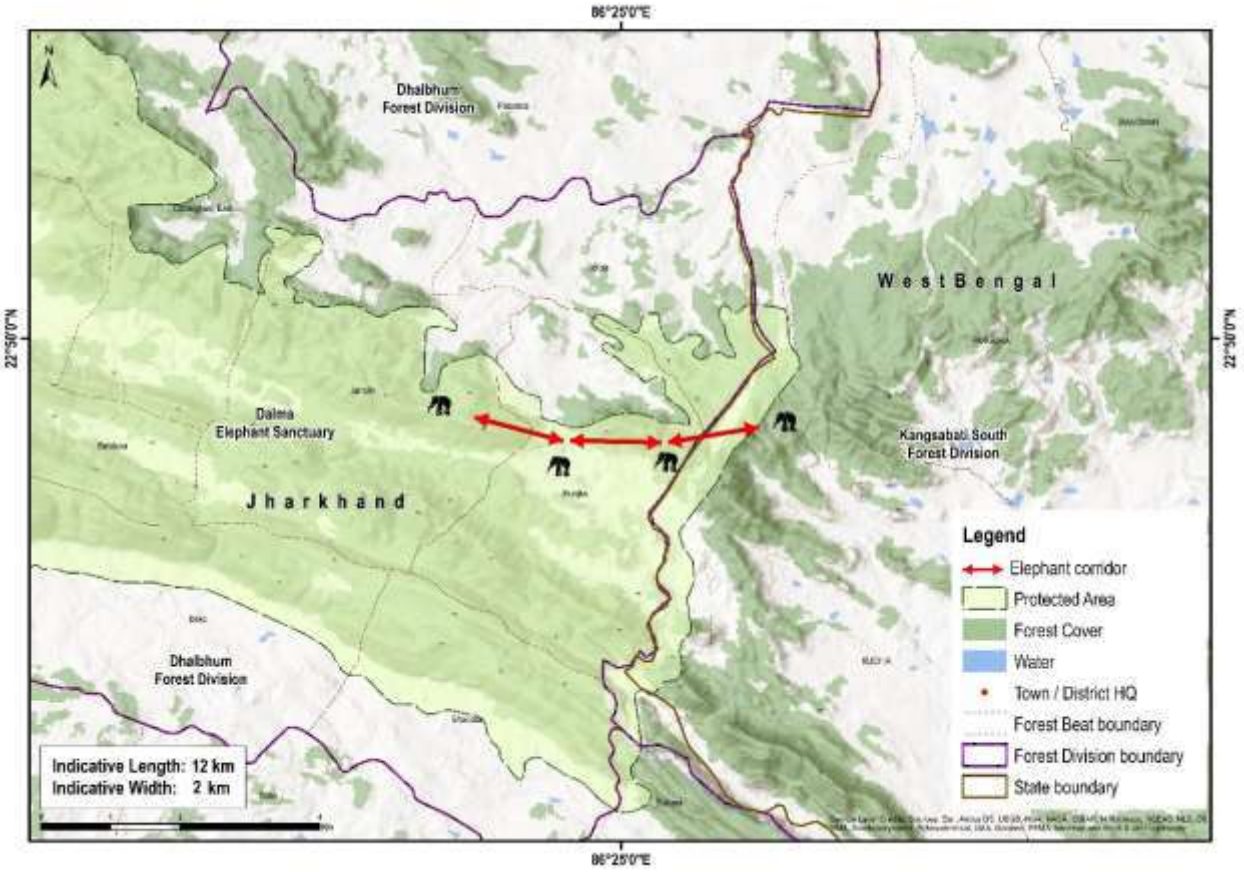
## 49. Mahilong- Kalimati Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Mahilong and Bagmundi Range of Ranchi Forest Division with Jhalda and Bagmundi Range of Purulia Forest Division.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 18 km, width = 0.5 km |
| **Geo Coordinates** | 23°14'20" N, 85°46'6" E to 23°20'23" N, 85°54'25" E |
| **Forest ranges falling within corridor** | Chandil, Matha, Mahilong and Bagmundi Range |
| **Revenue villages falling within corridor** | Approx 25 |
| **Habitat type** | Tropical dry deciduous forest |
| **Major land use** | Agricultural land, forests and settlements<br>Forest= 11750 ha<br>Agriculture= 150 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using this corridor** | 30- 35 |
| **Major bottleneck** | Non forest areas |
| **Linear infrastructure in the corridor** | 1) State Highway 4 and associated traffic.<br>2) 8 km of double track, electrified railway track<br>3) High tension power line, 11000 v |
| **Recommendations by the forest department to improve the corridor** | 1) Notification of the corridor and its legal protection<br>2) Habitat restoration and enrichment of the degraded forests in Kadla, Burudih, Chatarma and Digardih protected forests. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



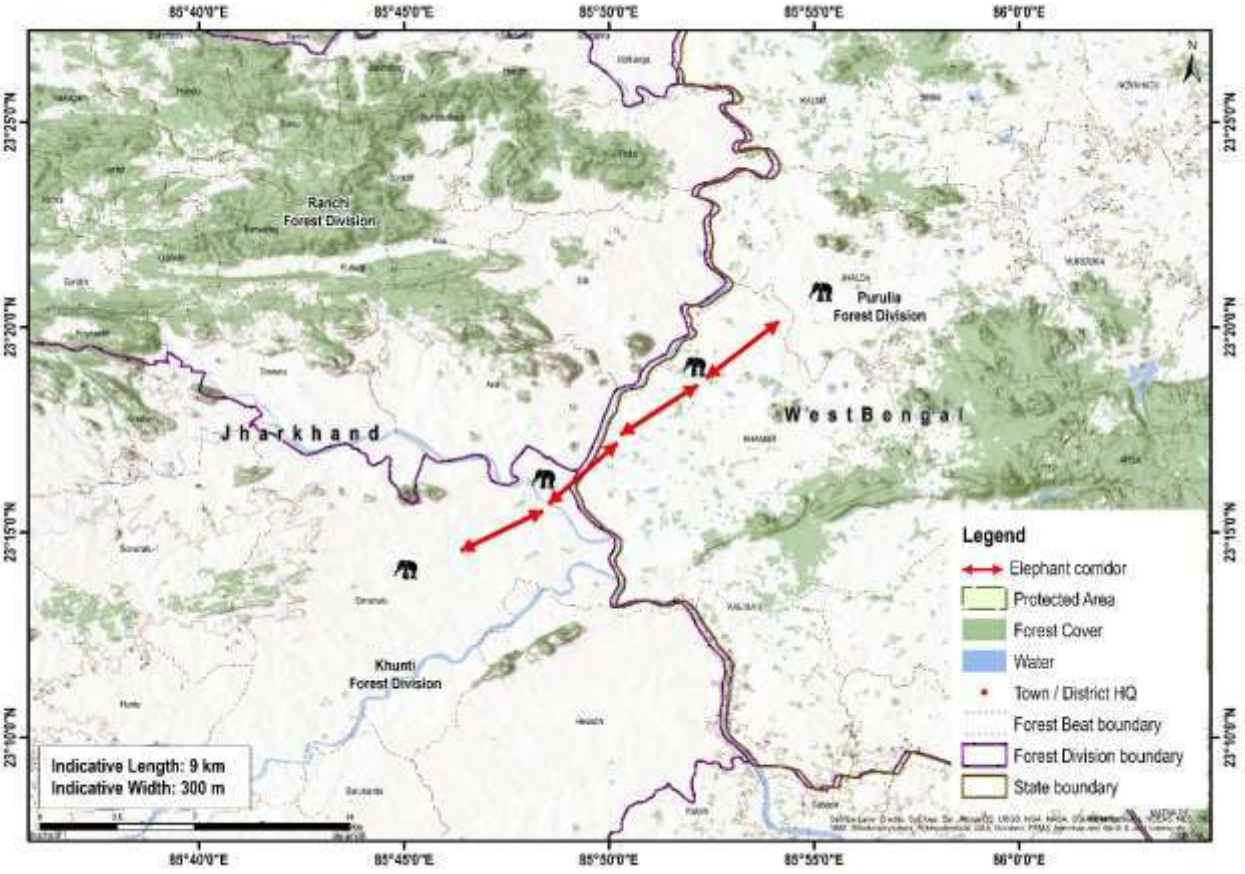
## 50. Gobarghusi- Jhunjhaka- Banduan Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Pagda and Chimti forest blocks of Dalma Wildlife Sanctuary in Jharkhand with the Banduan Range of Kangsawati South Division in West Bengal.** |
| **State** | West Bengal and Jharkhand |
| **Indicative length and width** | Length = 12 km, width = 2 km |
| **Geo coordinates** | 22°38'60" N, 86°23'54" E to 22°47'32" N, 86°36'5" E |
| **Forest ranges falling within corridor** | Banduan Range |
| **Revenue villages falling within corridor** | 4 |
| **Ecological importance** | This corridor connects Dalma Wildlife Sanctuary with Mayurjharna Elephant Reserve. |
| **Habitat type** | Tropical Dry deciduous forest |
| **Major land use** | Forest, Agriculture land and settlements<br>Forest= 2100 ha<br>Agriculture= 250 ha<br>Habitation= 50 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using this corridor** | Not recorded by forest department |
| **Bottleneck** | None |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | 1) Fodder plantation in and around the corridor<br>2) Development of water harvesting structures |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



## 51. Jhalda- Baghmundi Corridor

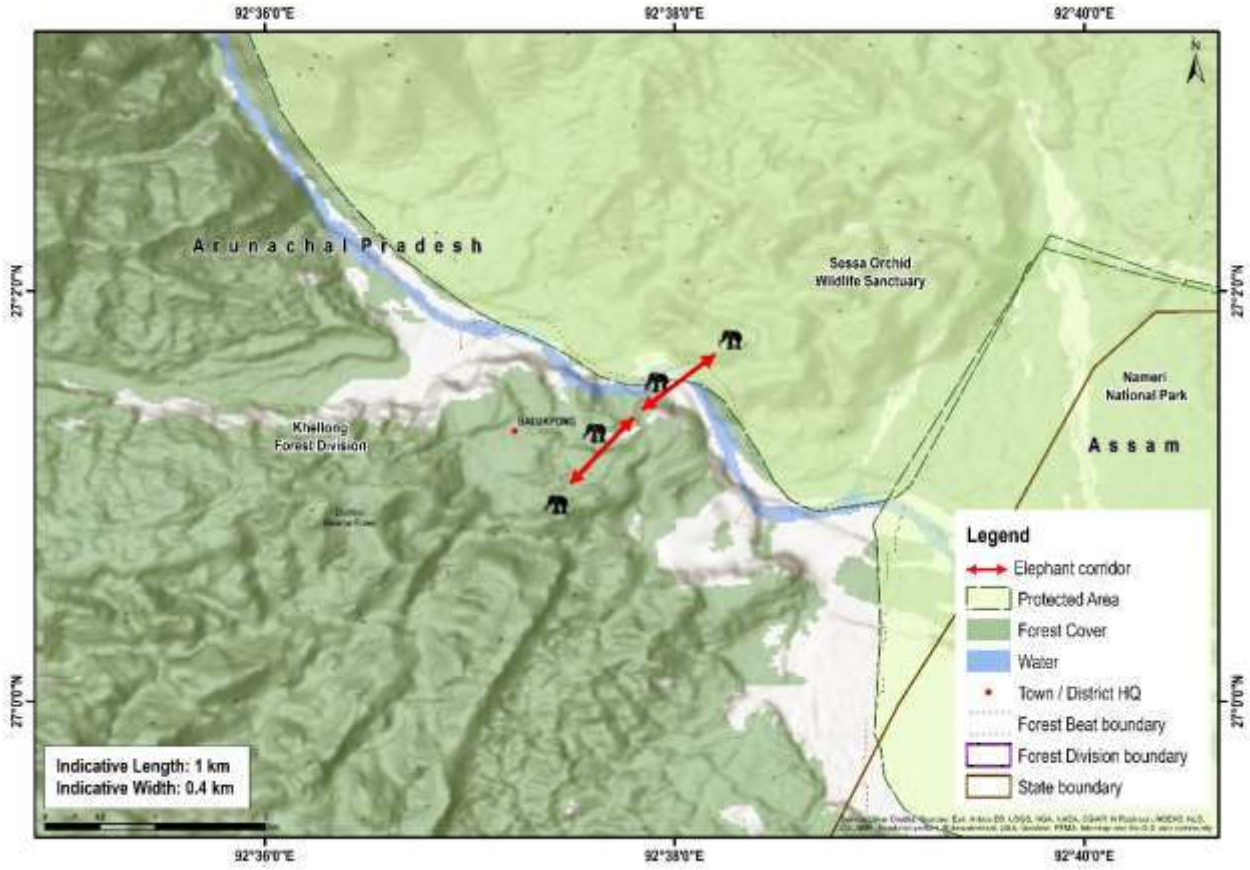
| Connectivity | This corridor connects Jhalda and Baghmundi Ranges |
|---|---|
| State | West Bengal |
| Indicative length and width | Length = 9 km, width = 300 m |
| Geo coordinates | N 23.221777º , E 85.865422º<br>N 23.368329º , E 85.875779º |
| Forest ranges falling within corridor | Jhalda and Baghmundi Ranges |
| Revenue villages falling within corridor | Approx 12 |
| Habitat type | Dry deciduous forest |
| Major land use | Forest = 8900 ha<br>Agriculture = 100 ha |
| Elephant movement status | Regular |
| Number of elephants using this corridor | 30- 35 |
| Major Bottleneck | Non forest land |
| Linear infrastructure in the corridor | 1) Village roads, heavily used by villagers<br>2) Railway track, 5 km, heavy traffic<br>3) High tension power line, 1100 v |
| Recommendations by the forest department to improve the corridor | Habitat enrichment on either sides of Subarnarekha river |
| Current status of the corridor | Active. Intensity of use by elephants increased. |



# *Elephant Corridors*
# North-East Region

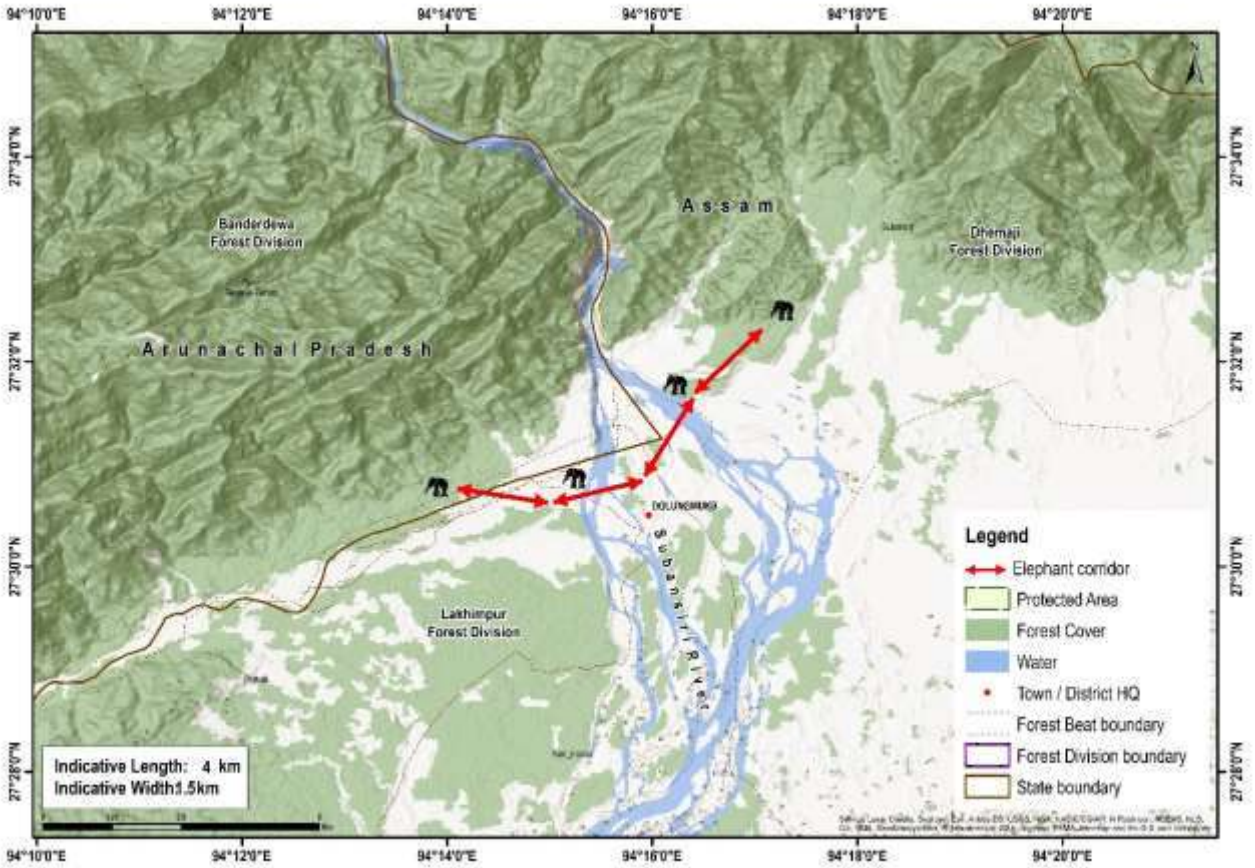
## 1. Pakke- Doimara at Dedzelling (Dadzu- Lumia) Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant habitats between Pakke Tiger Reserve and Doimara Reserve Forest of Khellong Forest Division.** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 1 km, width = 0.4 km |
| **Geo coordinates** | 27º 1' 1" N / 092º 37' 17" E<br>27º 1' 37" N / 092º 38' 11" E |
| **Forest ranges falling within corridor** | Bhalukpong Forest range |
| **Revenue villages falling within corridor** | Information NA |
| **Habitat type** | Tropical Evergreen and Semi Evergreen Forest |
| **Major land use** | Forest with plantations |
| **Elephant movement status** | Regular |
| **Number of elephants using the area** | 4 |
| **Linear infrastructure in the corridor** | 1) National Highway 229, 1 km of the road passes through the corridor<br>2) High vehicular traffic<br>3) Tippi Industrial estate about 1 km from corridor |
| **Major bottleneck** | Information NA |
| **Recommendations by the forest department to improve the corridor** | 1) Regular patrolling by the anti-poaching squad to monitor any illegal felling of tree or poaching.<br>2) Camera trapping for intense monitoring of the corridor.<br>3) Habitat improvement activities in the corridor area. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



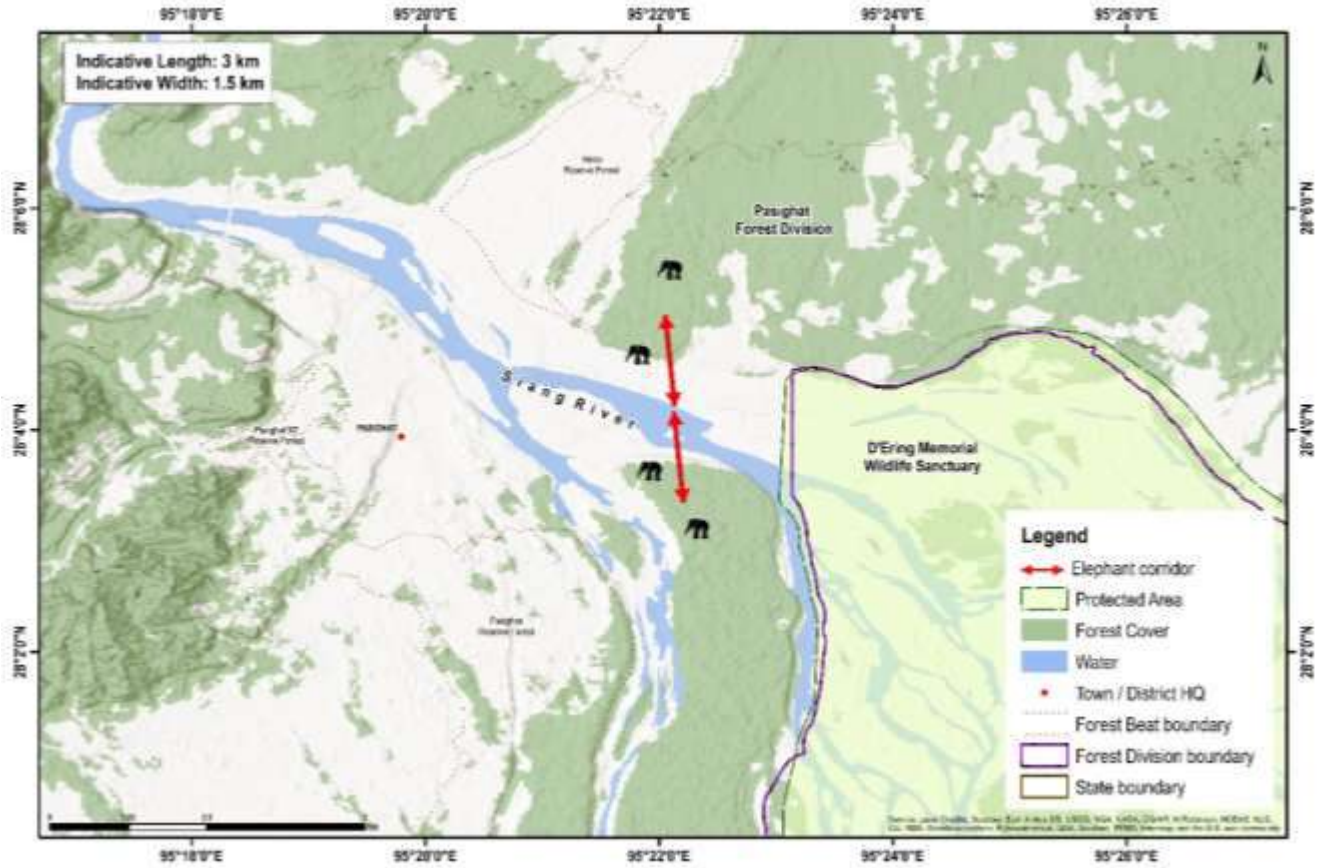
## 2. Dulung- Subansiri Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Panir Reserve Forest (Banderdewa Division, Arunachal Pradesh) and Dulung Reserve Forest with Subansiri Reserve Forest (Lakhimpur Forest Division, Assam) across the Subansiri river.** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 4 km, width = 1.5 km |
| **Geo coordinates** | N 27º 29' 34.8", 27º29' 48.2" / E 94º 10' 48.7", 94º 08' 12.8" |
| **Forest ranges falling within corridor** | Dirsha range |
| **Revenue villages falling within corridor** | 4 |
| **Administrative details of the corridor** | Panir Reserve Forest and Dulung Reserve Forest with Subansiri Reserve Forest |
| **Habitat type** | Mixed forests with bamboo and wild banana. |
| **Major land use** | Forest (94%)<br>Agriculture (0.5%)<br>Habitation and others (5.5%) |
| **Elephant movement status** | Seasonal, mainly during October to December |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department** | 1) Habitat improvement activities in the corridor area.<br>2) Awareness programs for villages around the corridor. |
| **Status of the corridor** | Active. Intensity of use by elephants decreased. |



## 3. D'Ering- Mebo (Sigar Nallah) Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Borgoli Range of D'ering Memorial Wildlife Sanctuary and Mebo Reserve Forest of Pasighat Forest Division and Dibang Forest Division on either side of the Siang River.** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 3 km, width = 1.5 km |
| **Geo coordinates** | 28° 3.176' / 95° 25.148'<br>28° 3.438' / 95° 24.304'<br>28° 4.404' / 95° 24.525'<br>28° 4.372' / 95° 24.110' |
| **Forest ranges falling within corridor** | Borgoli Range |
| **Revenue villages falling within corridor** | 3 |
| **Ecological importance** | This corridor connects the D. Ering WLS and Mebo RF of Pasighat Forest Division. The corridor facilitates movement of elephants and other wildlife like the tigers (*Panthera tigris*) and Himalayan black bear (*Ursus thibetanus*). |
| **Habitat type** | Tropical Evergreen Forest |
| **Major land use** | Forest<br>Agricultural land<br>Plantations |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 328 |
| **Linear infrastructure in the corridor** | 1) National Highway 13 - 5 km of the road passes through the corridor<br>2) Proposed railway track connecting Pasighat to Roing |
| **Major bottleneck in the corridor** | Establishment of the army base in the middle of the corridor |
| **Recommendations by the forest department to improve the corridor** | 1) Extension of the biosphere zone right upto the interstate border<br>2) Restoration of degraded habitats and a policy on land falling under elephant corridor.<br>3) Livelihood support to the conflict affected villages.<br>4) HEC mitigation. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



## 4. Pakke- Papum at Langka nallah Corridor

| Connectivity | The corridor connects Papum Reserve Forest with Pakke Tiger Reserve. |
|---|---|
| State | Arunachal Pradesh |
| Indicative length and width | Length = 0.5 km, width = 0.8 km |
| Geo coordinates | 27° 1' 2 N / 93° 1' 44 E<br>27° 1' 39 N / 93° 2' 2 E |
| Forest ranges falling within corridor | Seijosa territorial range |
| Revenue villages falling within corridor | Two |
| Administrative details of the corridor | Western and Eastern side of Papum Reserve Forest, Khelong Forest Division, Pakke Wildlife Sanctuary and Tiger Reserve and Pakke Kessang |
| Habitat type | Tropical Evergreen to Semi evergreen |
| Major land use | Agricultural land, Settlements and Seijosa Nallah River |
| Elephant movement status | Seasonal, during monsoon season(May to September) |
| Number of elephants using the corridor | 25 - 30 |
| Linear infrastructure in the corridor | NEC road connecting Seijosa and Pakke Kessang, 15 km road passing through the corridor |
| Major bottleneck | Establishment of Langka village |
| Recommendations by the forest department to improve the corridor | 1) Accurate demarcation of corridor is needed through proper study.<br>2) As most of the land is disputed, a planned study is required for the corridor area. |
| Current status of the corridor | Active. Intensity of use by elephants decreased. |

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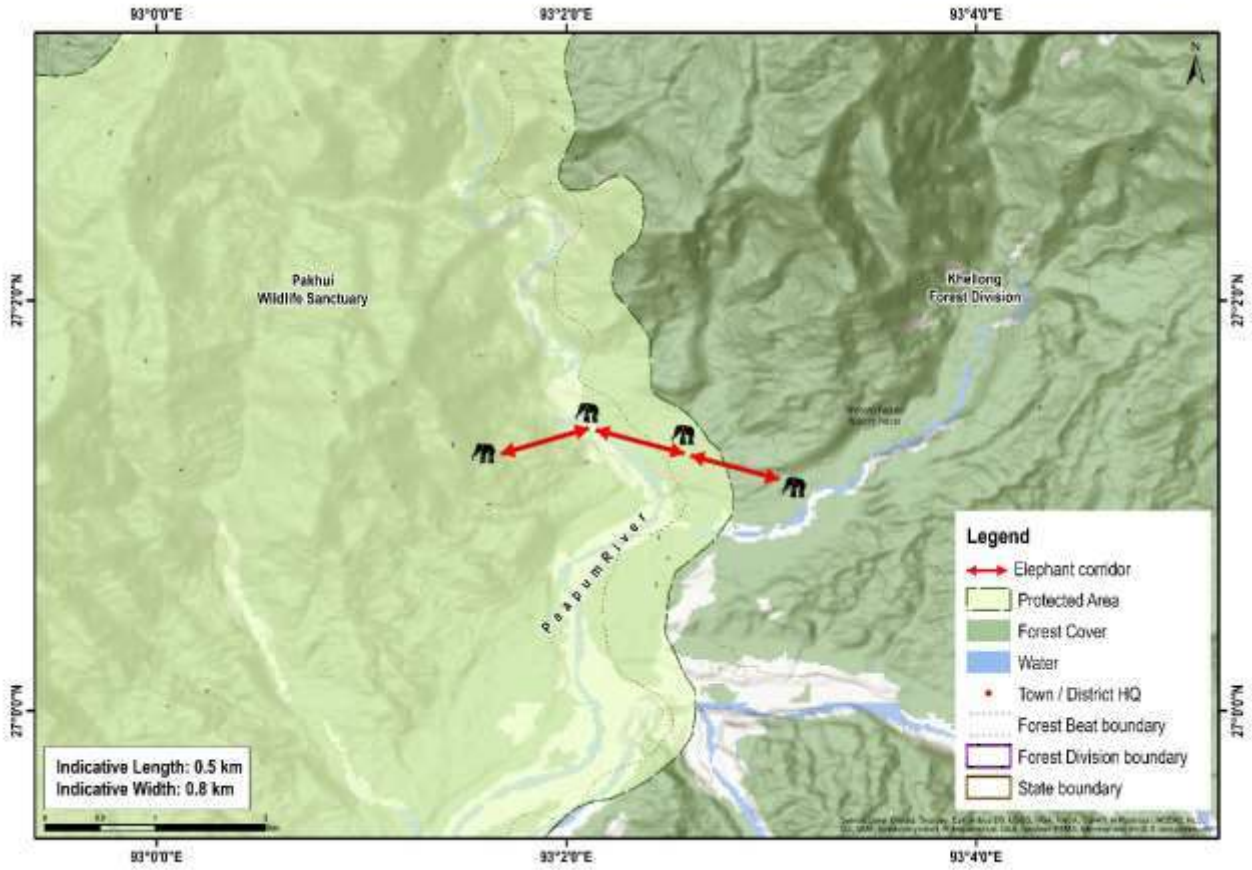
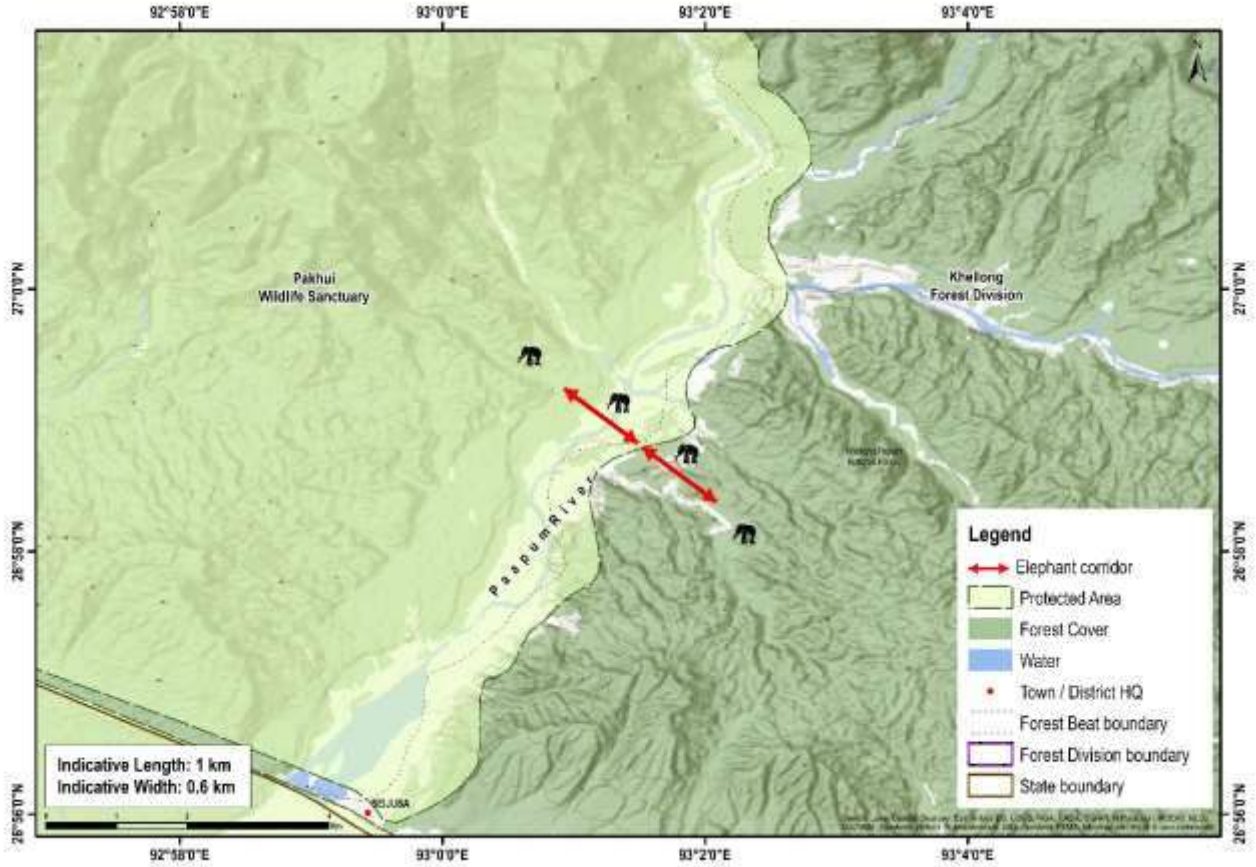


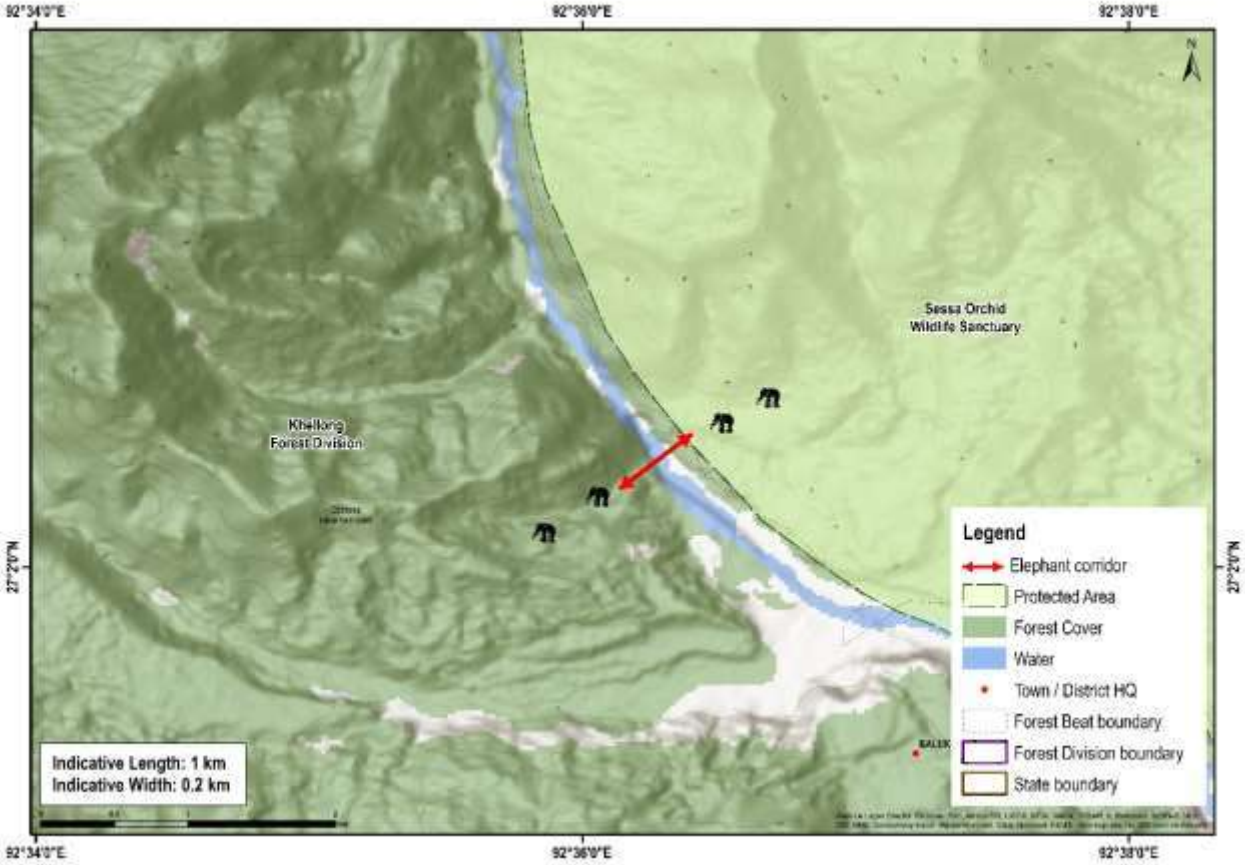
## 5. Pakke- Papum Seijosa nallah Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Papum Reserve Forest in the Khelong Forest Division to Pakke Tiger Reserve.** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 1 km, width = 0.6 km |
| **Geo coordinates** | 26° 58' 23" N / 93° 0' 49" E<br>26° 59' 22" N / 93° 2' 2" E |
| **Forest ranges falling within corridor** | Seijosa territorial range |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | The corridor is critical link into Pakke Tiger Reseve that harbors tigers (*Panthera tigris*), leopard (*Panthera pardus*), clouded leopard (*Neofelis nebulosa*), Himalayan black bear (*Ursus thibetanus*) and others. |
| **Habitat type** | Tropical Evergreen to Semi evergreen |
| **Major land use** | Agricultural land, Settlements and Seijosa Nallah River |
| **Elephant movement status** | Seasonal, during monsoon season (May to September) |
| **Number of elephants using the corridor** | 25 - 30 |
| **Linear infrastructure in the corridor** | 1) 15 km of NEC road connecting Seijosa and Pakke Kessang road passing through the corridor<br>2) Proposed high power tension line |
| **Major bottleneck** | Establishment of two villages viz. Lower Balibasti and Upper Balibasti |
| **Recommendations by the forest department to improve the corridor** | 1) Accurate demarcation of corridor is needed.<br>2) As most of the land is disputed, a planned study is required for the corridor area. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



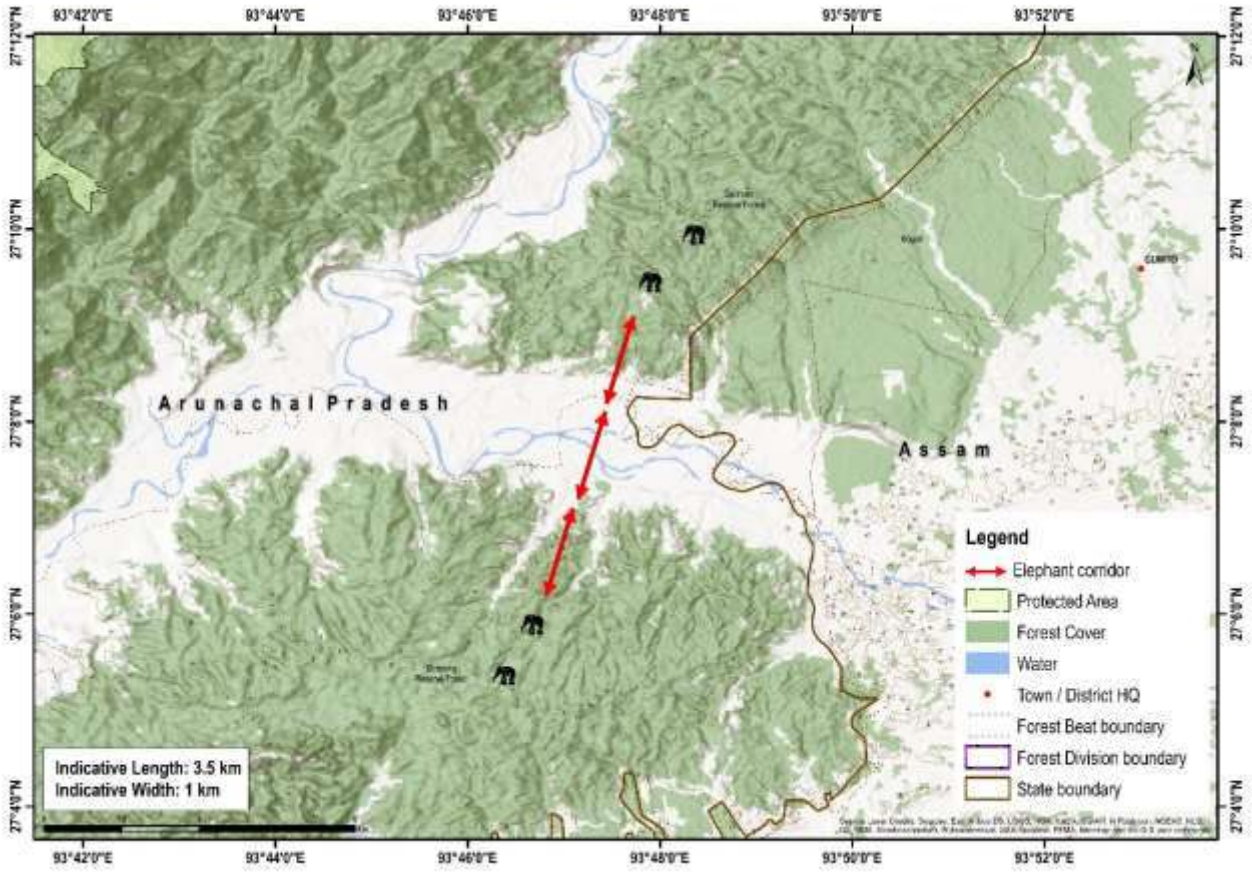
## 6. Pakke- Doimara at Tippi Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Pakke Tiger Reserve with Doimara Reserve Forest of Khellong Forest Division** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 1 km, width = 0.2 km |
| **Geo coordinates** | 27º 1' 1" N / 092º 37' 17" E<br>27º 01' 35.2" N / 092º 36' 43.1" E |
| **Forest ranges falling within corridor** | Bhalukpong range |
| **Revenue villages falling within corridor** | One |
| **Administrative details of the corridor** | Khellong Forest division, |
| **Ecological importance** | Pakke Tiger Reseve harbors good population of Tigers, Hornbills, Leopard, Clouded leopard, Himalayan black bear and binturong etc. |
| **Habitat type** | Tropical evergreen forest and semi evergreen forest |
| **Major land use** | Forest, Kameng River, settlements |
| **Elephant movement status** | Seasonal, during monsoon season (May to September) |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1. National Highway 229, 1 km of road passes through the corridor and its heavy vehicular traffic<br>2. Fencing around the residential area<br>3. Tippi industrial estate<br>4. Concrete walls as boundary of the Tippi tourism guest house and Orchid Research Centre |
| **Recommendations by the forest department to improve the corridor** | This corridor is no longer being used by elephants |
| **Current status of the corridor** | Impaired<br>Earlier this corridor was used by elephants for crossing into Doimara RF. However, due to obstruction of the corridor at Tippi, the elephants take the route of Dedzeling nullah to reach Dadzu-Lumia-Dedzeling at present for their further movement to Doimara RF. Thus, the Dadzu – Lumia (Dedzeling) serves as the substitute for the Pakke – Doimara elephant corridor at Tippi. |



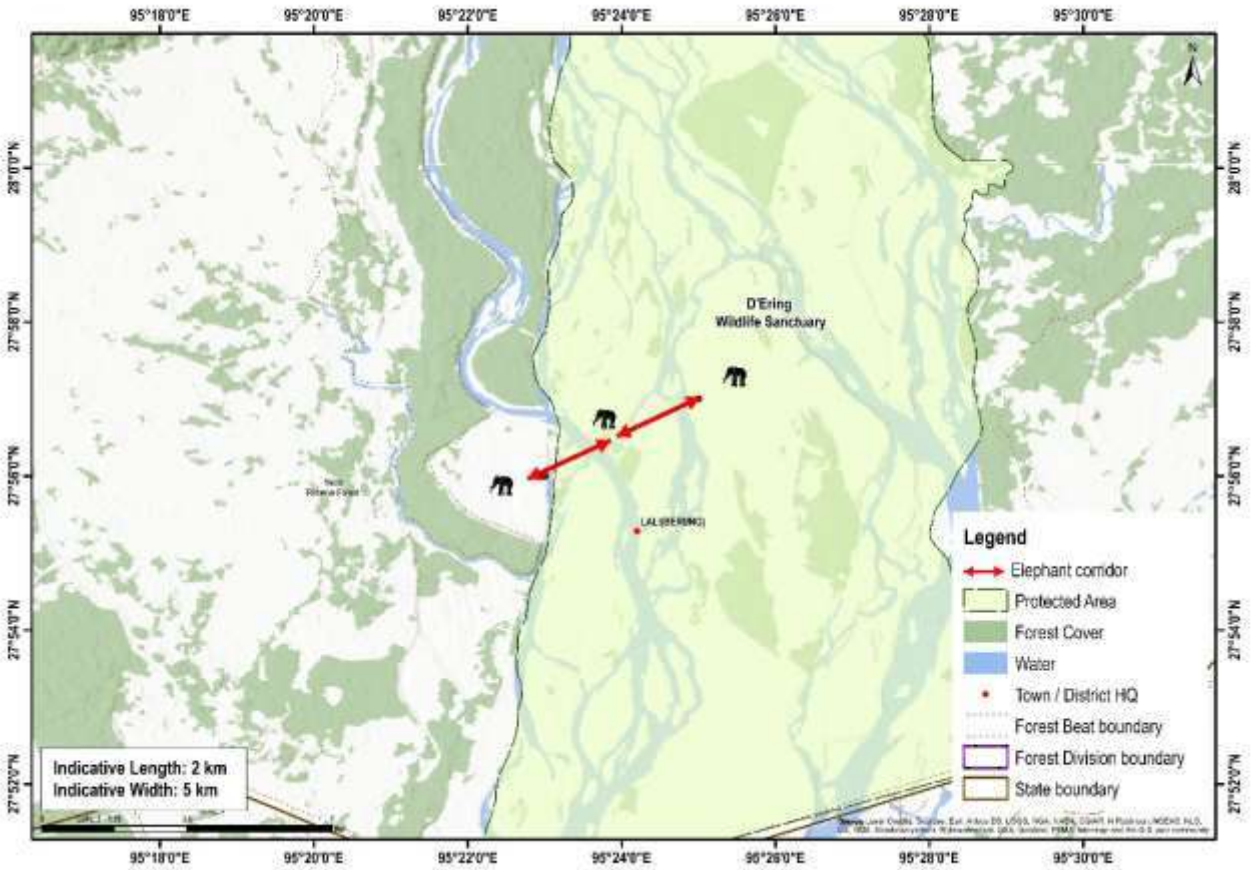
## 7. Durpong - Doimukh at Khundakhuwa Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Durpong Forest Reserve with the proposed Doimukh Reserve Forest.** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 3.5 km, width = 1 km |
| **Geo coordinates** | 27°06'54", 27°07'09"N<br>93°47'26", 93°48'26"E |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Tropical semi-evergreen forest |
| **Major land use** | Forest, agriculture and settlements |
| **Elephant movement status** | None |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | Heavy vehicular traffic along National Highway-52A |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the state<br>2) Regulating night traffic along the National Highway-52A<br>3) Protection of Khundakhuwa nullah from encroachment<br>4) Finding alternatives for 55 households of Berup and Gumto villages<br>5) Protection of the small grassland at the point where River Dikrong and Khundakhowa nullah converge |
| **Current status of the corridor** | Impaired |



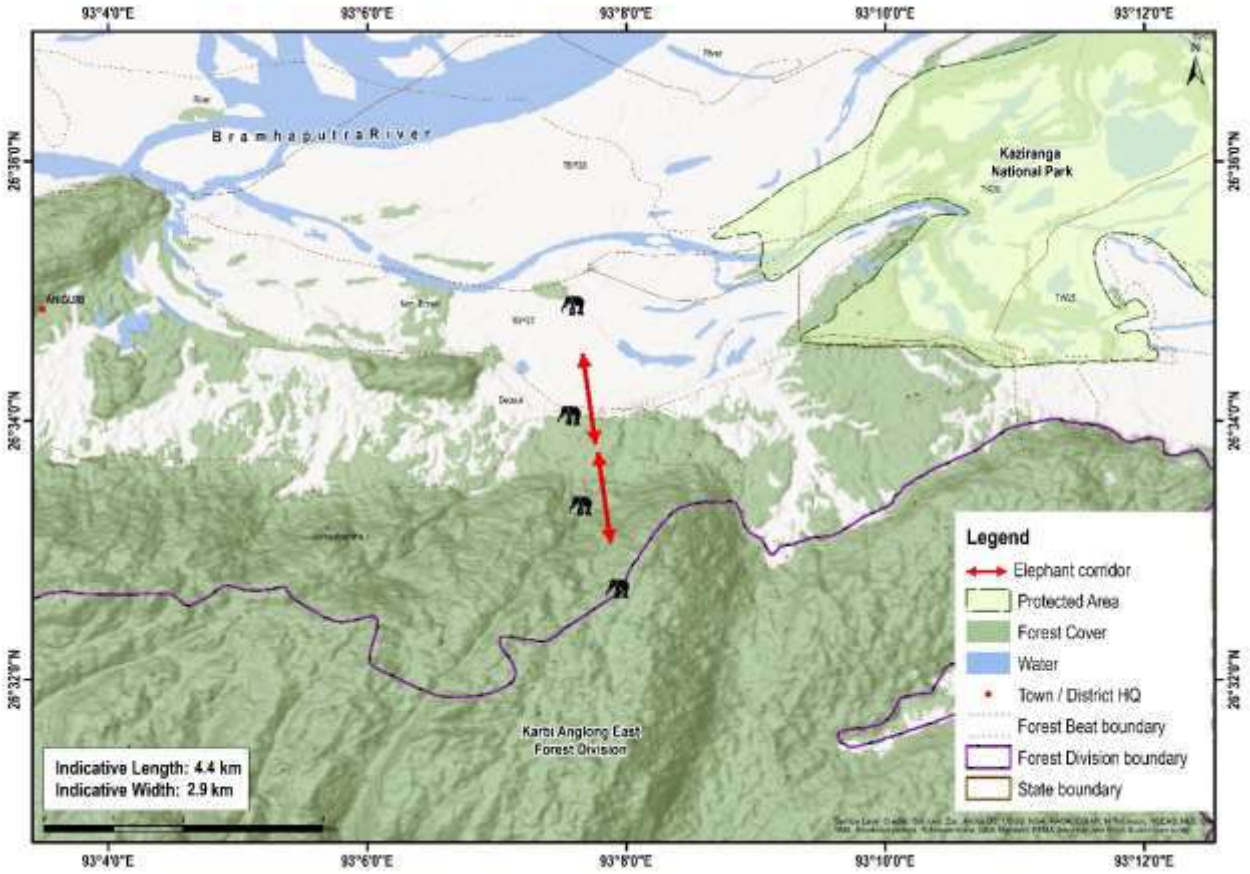
## 8. D'ering - Mebo at Kongkul Corridor

| | |
|---|---|
| **Connectivity** | **D'Ering Memorial Wildlife Sanctuary with Mebo Reserve Forest leading to Dibang Reserve Forest of Roing Forest Division** |
| **State** | Arunachal Pradesh |
| **Indicative length and width** | Length = 2 km, width = 0.5 km |
| **Geo coordinates** | 27°56'–27°57' N<br>95°23'–95°25' E |
| **Revenue villages falling within corridor** | 1 |
| **Ecological importance** | Elephants from D'Ering Wildlife Sanctuary used this corridor to move to Mebo Reserve forest through the Sissar River bed. |
| **Habitat type** | Tropical evergreen forest |
| **Major land use** | Forest, agriculture and settlement |
| **Elephant movement status** | Information NA |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the state<br>2) Seeking alternatives for Kongkul village<br>3) Protecting the corridor forest by eco-development in Kongkul village<br>4) Declaring the corridor and surrounding forest areas as Community Reserves |
| **Current status of the corridor** | Impaired |



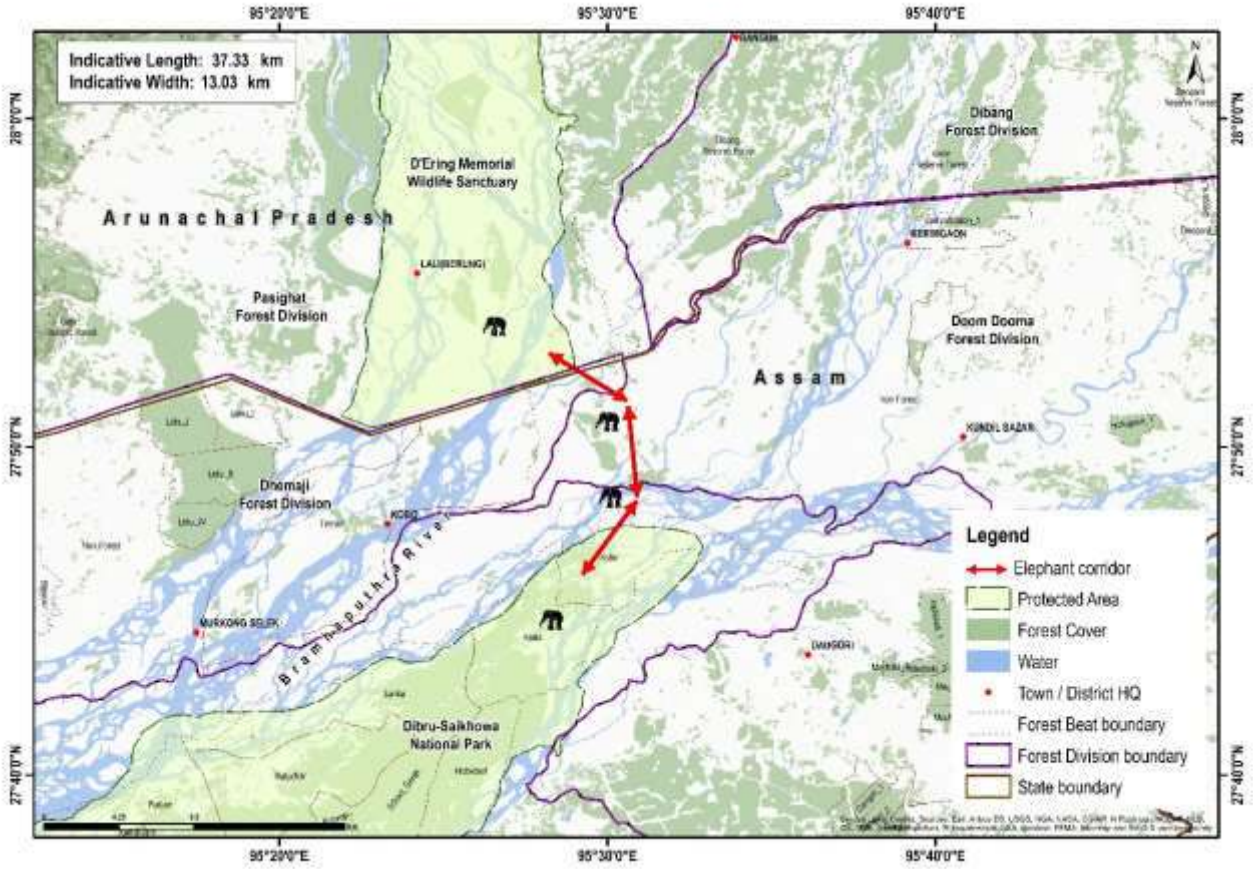
## 9. Deosur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Burapahar Range of Kaziranga National Park to Porcupa Range of East Karbi Anglong Forest Division** |
| **State** | Assam |
| **Indicative length and width** | Length = 4.44 km, Width = 2.9 km |
| **Geo coordinates** | N 26° 34' 5.153", 26° 33'41.180"/ E 93° 7'30.138", 93° 9'20.274" |
| **Forest ranges falling within corridor** | Burapahar Range and Porcupa Range |
| **Revenue villages falling within corridor** | 2 |
| **Ecological importance** | The corridor is part of Kaziranga Nationa Park which harbors large number of elephants along with other megafauna species like one-horned rhinoceros. |
| **Habitat type** | Tropical moist deciduous forest |
| **Major land use** | Forest<br>Agriculture<br>Tea plantations<br>Settlements |
| **Elephant movement status** | Seasonal, during monsoon |
| **Number of elephants using the corridor** | Not recorded |
| **Linear infrastructure in the corridor** | 1) National Highway 37, 6.8 km of road passes through the corridor, vehicular frequency is also high<br>2) High tension power line (440 V) |
| **Bottlenecks in the corridor** | National Highway 37 |
| **Recommendations by the forest department to improve the corridor** | Around 26.63 ha of the corridor is under revenue land. The revenue authorities should minimize human influences and help in restoring the structural corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available. |



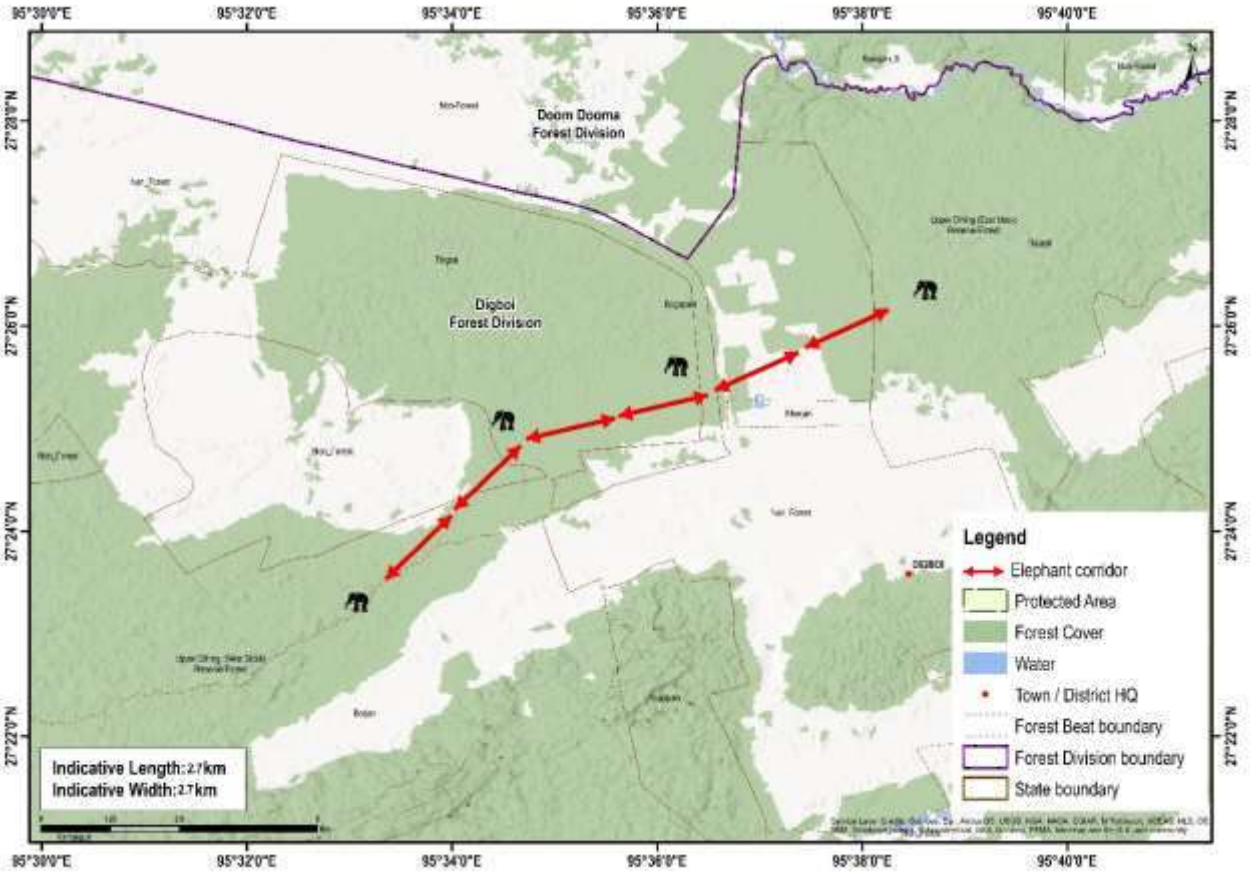
## 10. D'ering- Dibru Saikhowa Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the D'ering Memorial Wildlife Sanctuary, Dibang Forest Division and Pasighat Forest Division (Arunachal Pradesh) with Dibru Saikhowa National Park (Assam) via forest patches of the Sadiya Forest Range of Doomdooma Forest Division.** |
| **State** | Assam and Arunachal Pradesh |
| **Indicative length and width** | Length = 37.33 km, Width = 13.03 km |
| **Geo coordinates** | N 27º 50' 36.041", 27º 51'13.986"/ E 95º 49'58.861", 95º 49'46.320" |
| **Beats falling within corridor** | Sadiya beat |
| **Forest ranges falling within corridor** | Sadiya and Anchalghat Forest Range |
| **Revenue villages falling within corridor** | S7 |
| **Administrative details of the corridor** | The corridor connects D'Ering Memorial Wildlife Sanctuary and Dibru Saikhowa National Park |
| **Habitat type** | Semi Evergreen and Riverine Forest. |
| **Major land use** | Forests<br>River & flood plains<br>Agricultural land<br>Human settlements |
| **Elephant movement status** | Regular with seasonal peaks during months from October to February |
| **Number of elephants using the corridor** | > 40 |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should have a legal entity so that the state forest department could protect the corridor.<br>2) Prevention of encroachment and new settlements towards the Assam state.<br>3) Support for the local communities for improving their livelihood and minimize their interactions with the elephants. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



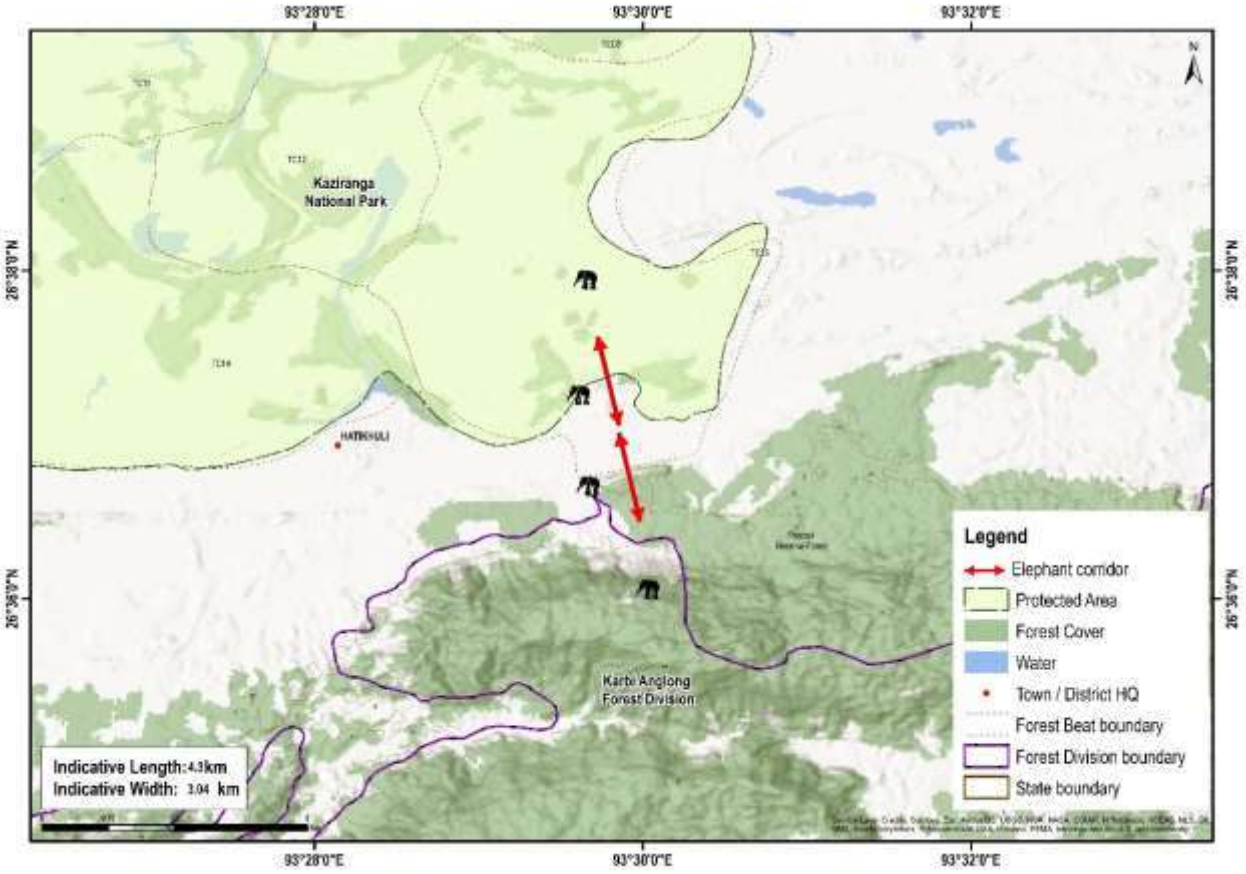
## 11. Bogapani Corridor- Upper Dihing East- Upper Dihing West Block

| | |
|---|---|
| **Connectivity** | **This corridor connects the East and West Blocks of Upper Dihing Reserve Forest in Digboi Forest Division** |
| **State** | Assam |
| **Indicative length and width** | Length = 2.79 km, Width = 2.74 km |
| **Geo coordinates** | N 27º 25'1.453", 27º25'1.453"/ E 95º 36'25.842", 95º 36'25.842" |
| **Compartments falling within corridor** | Compartment 94 UDRF West Block and compartments 21,22 & 23 in UDRF East Block. |
| **Forest ranges falling within corridor** | Lakhipathar Range and Digboi Range |
| **Revenue villages falling within corridor** | 2 |
| **Administrative details of the corridor** | The corridor connects the Upper Dihing East - Upper Dihing West block |
| **Ecological importance** | The corridor helps in the extended movement of elephants to and from Dihing-Patkai Elephant Reserve. |
| **Habitat type** | Tropical Evergreen Forest. |
| **Major land use** | Forest, Agricultural land and Tea plantations. |
| **Elephant movement status** | Seasonal, majorly in months of October to February. |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) National Highway 38, 1 km of the road passes through the corridor<br>2) Single track non electrified railway line (1 km) |
| **Bottleneck in the corridor** | Railway track and National Highway |
| **Recommendations by the forest department to improve the corridor** | 1) Up gradation of the corridor area into community and conservation reserve.<br>2) Removal of encroachment<br>3) Purchasing the private land falling in the corridor area<br>4) Creation of over bridges in the area for the vehichles. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



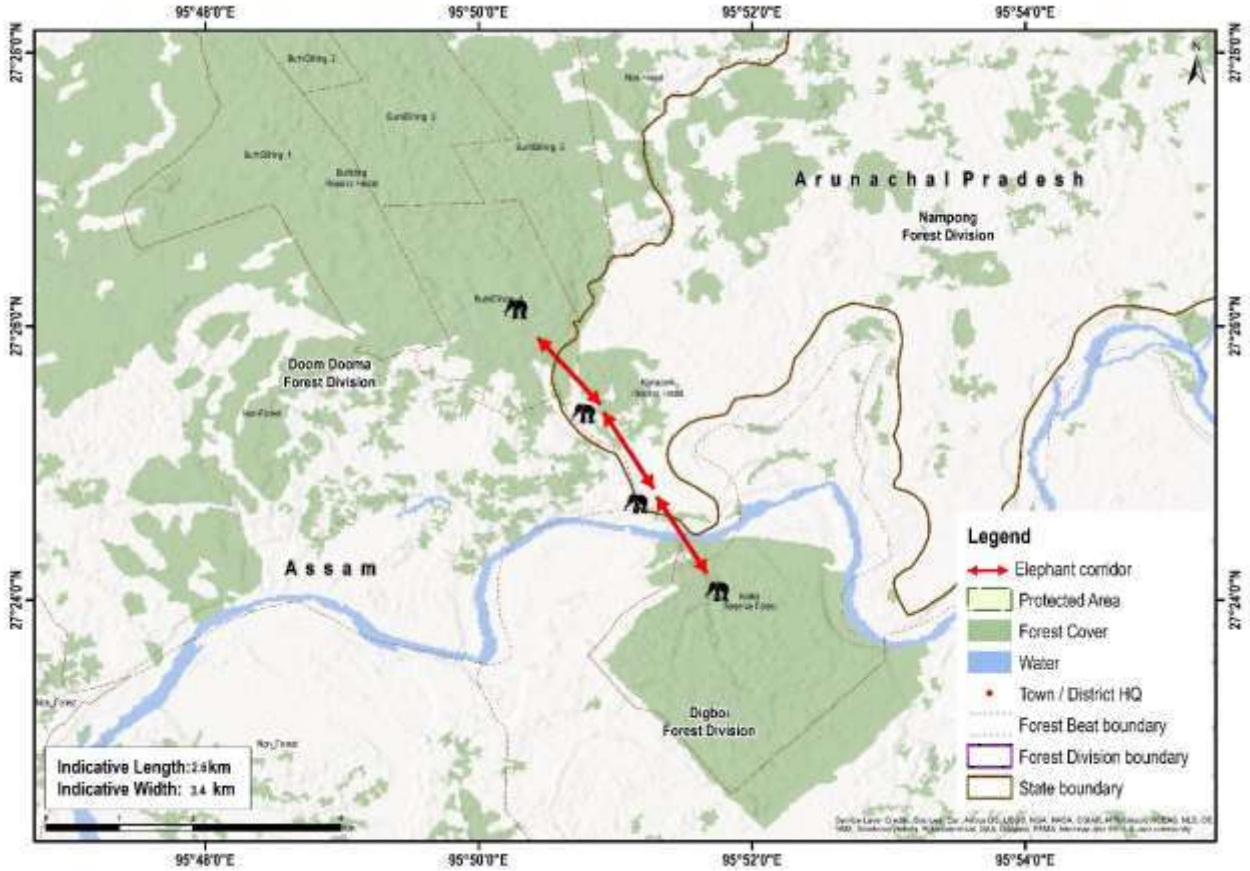
## 12. Panbari Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant habitats of Kaziranga National Park with Karbi Anglong Forest Division through Panbari Reserve Forest.** |
| **State** | Assam |
| **Indicative length and width** | Length = 4.3 km, width = 3.0 km |
| **Geo coordinates** | N 26° 37'10.303", 26°36'44.927"/ E 93° 31'0.100", 93° 29'48.442" |
| **Forest ranges falling within corridor** | Central Kohora Range |
| **Revenue villages falling within corridor** | 2 |
| **Administrative details of the corridor** | The corridor connects Kaziranga National Park with Karbi Anglong Forest |
| **Ecological importance** | The corridor is part of Kaziranga Nationa Park which harbors large number of elephants along with other megafauna species like one-horned Rhinoceros. |
| **Habitat type** | Tropical Semi Evergreen Forest |
| **Major land use** | Forest<br>Agricultural |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) National Highway 37, 4 km of the road passes through the corridor with around 1500 vehicles passing per day<br>2) High tension power line (440 V) |
| **Bottleneck in the corridor** | National Highway 37 |
| **Recommendations by the forest department to improve the corridor** | 1) Addressing human encroachment in the area.<br>2) Land use change restrictions should be imposed |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



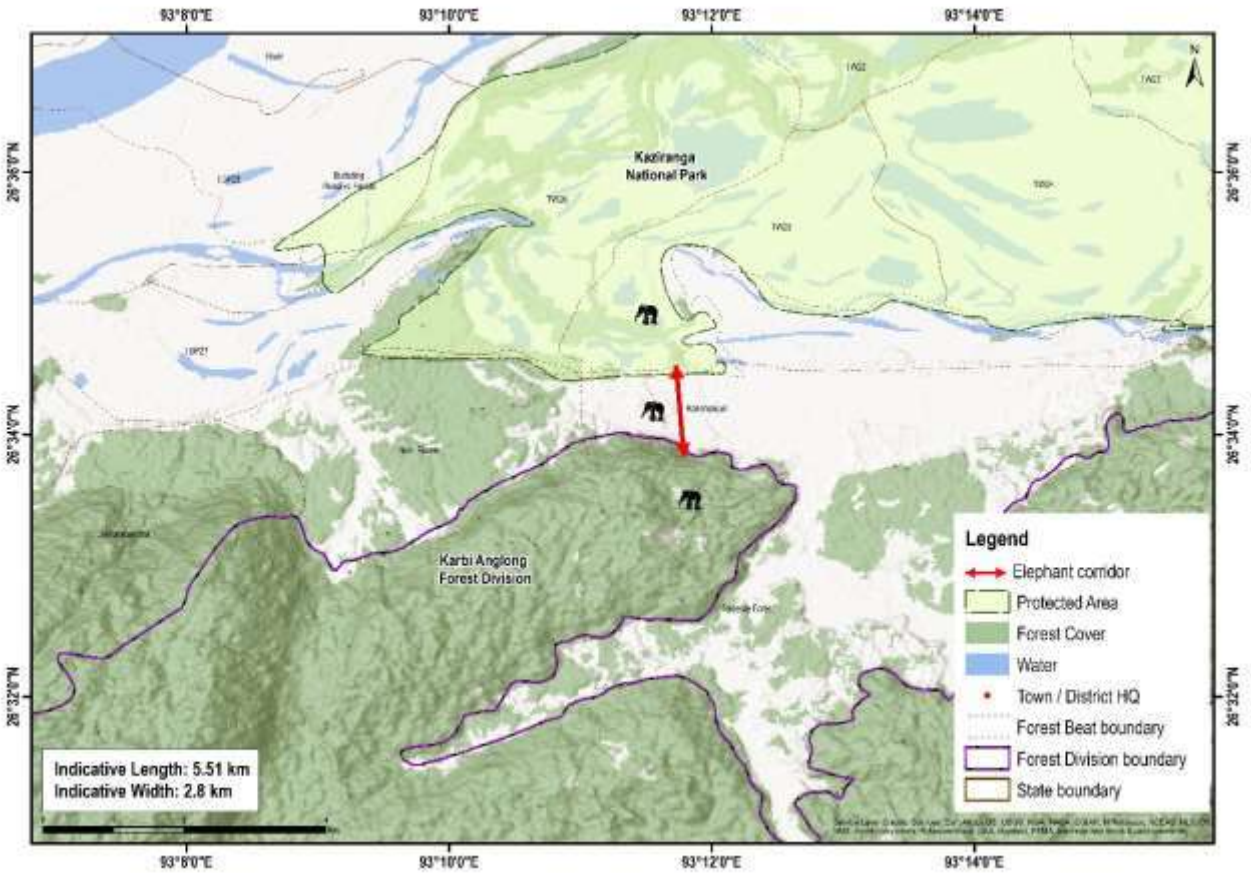
## 13. Kotha Buridehing Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Kotha Reserve Forest of Digboi Forest Division with Buridehing Reserve Forest of Khatangpani Range of Doomdooma Forest Division** |
| **State** | Assam |
| **Indicative length and width** | Length = 2.62 km, Width = 3.41 km |
| **Geo coordinates** | N 27º 25'25.056", 27º 25' 25.056"/ E 95º 50'24.976", 95º 50' 24.976" |
| **Forest ranges falling within corridor** | Khatangpani Range and Jagun Range |
| **Revenue villages falling within corridor** | Six |
| **Habitat type** | Semi evergreen Forest and Riverine Forest. |
| **Major land use** | Forest<br>River and flood plains<br>Agricultural land<br>Settlements |
| **Elephant movement status** | Regular with seasonal peaks during months from October to February |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should have a legal entity so that the state forest department could protect the corridor.<br>2) Encroachment from the Buridihing Reserve Forest should be freed.<br>3) Controlled and regulated agricultural practices.<br>4) Terminating the brick kilns from the corridor area. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



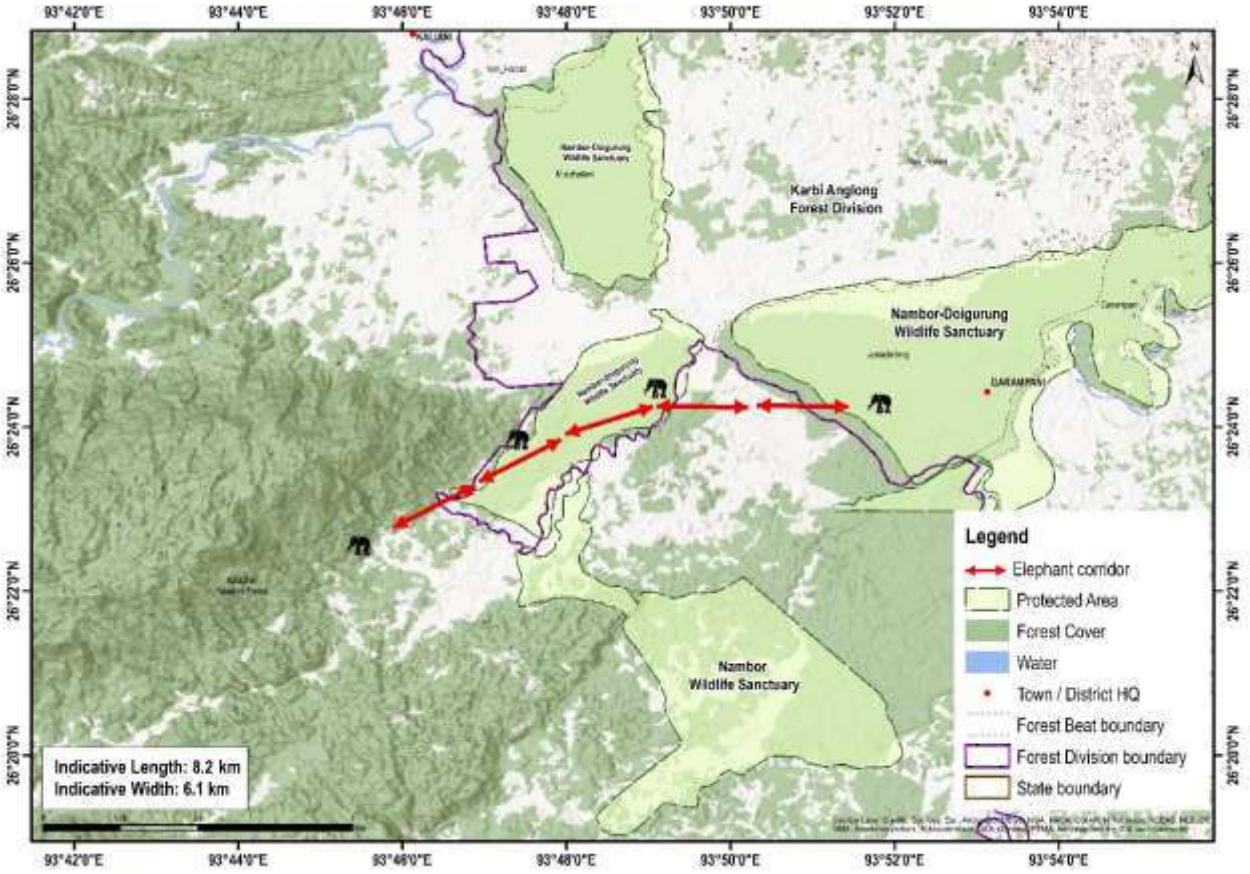
## 14. Kanchanjuri Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant habitats of Kaziranga National Park with Ruthepahar forest of East Karbi Anglong Forest Division (towards the northeast) and Bagser Reserve Forest of Nagaon Forest Division (to the southwest).** |
| **State** | Assam |
| **Indicative length and width** | Length = 5.51 km, width = 2.81 km |
| **Geo coordinates** | N 26° 34' 25.402", 26° 35' 27.205"/ E 93° 10' 46.970", 93° 11' 38.073" |
| **Forest ranges falling within corridor** | Western Bagori Range |
| **Revenue villages falling within corridor** | 3 |
| **Ecological importance** | The corridor is part of Kaziranga Nationa Park which harbors large number of elephants along with other mega fauna species like one-horned rhinoceros. |
| **Habitat type** | Tropical moist deciduous |
| **Major land use** | Forest<br>Agricultural land |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 3.3 km of National Highway 37 passing through the forest |
| **Bottleneck in the corridor** | National Highway 37 |
| **Recommendations by the forest department to improve the corridor** | 1) Prevention of human induces disturbances in and around the corridor.<br>2) Land use change restrictions should be imposed. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



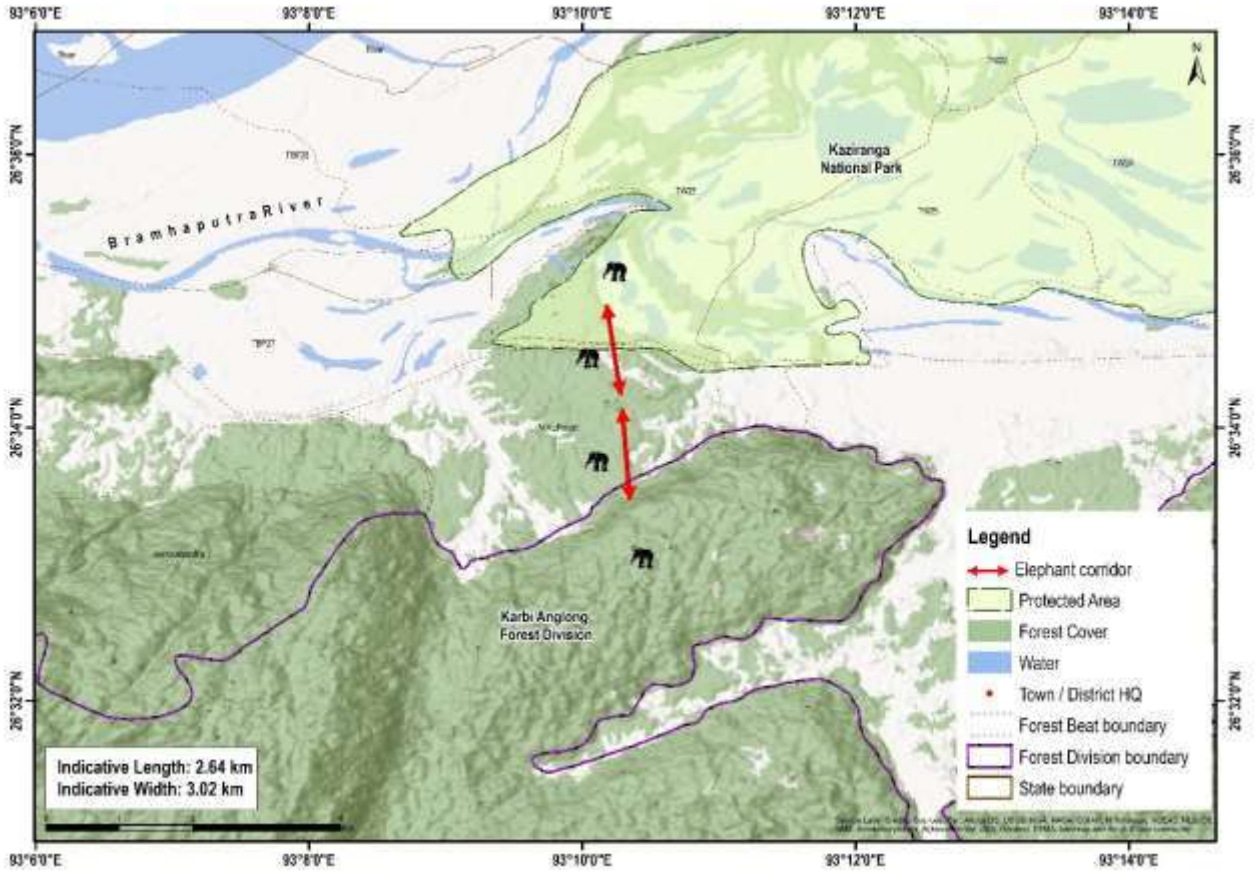
## 15. Kalapahar- Doigrung Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Kalapahar Proposed Reserve Forest and Nambor West Block of East Karbi Anglong Division with Nambor-Doigrung. The corridor is formed from the land gifted by Sar Kro village and the land vacated by Ram Terang village and part of Doigrung and Nambor wildlife sanctuary under Golaghat Range, Golaghat District. Wildlife Sanctuary (Nambor North Block in Golaghat District)** |
| **State** | Assam and Arunachal Pradesh |
| **Indicative length and width** | Length = 8.27 km, width = 6.17 km |
| **Geo coordinates** | N 26º 23'12.331", 26º 23' 12.331"/ E 93º 47'48.671", 93º 47' 48.671" |
| **Forest ranges falling within corridor** | Golaghat Range |
| **Habitat type** | Mix moist deciduous and Semi evergreen Forest. |
| **Major land use** | Forests<br>Agricultural land<br>Settlements |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | NA. But in a single herd 30+ elephants can be seen. |
| **Linear infrastructure in the corridor** | 1) PWD road from Silonijan to Chowkihola, 2.5 km of this road falls within the corridor<br>2) Increased vehicular traffic |
| **Recommendations by the forest department to improve the corridor** | 1) Proper demarcation of the corridor is urgently required.<br>2) The encroached area should be converted into plantations and further encroachment should be restricted.<br>3) Anti- poaching camps should be constructed near the corridor areas. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



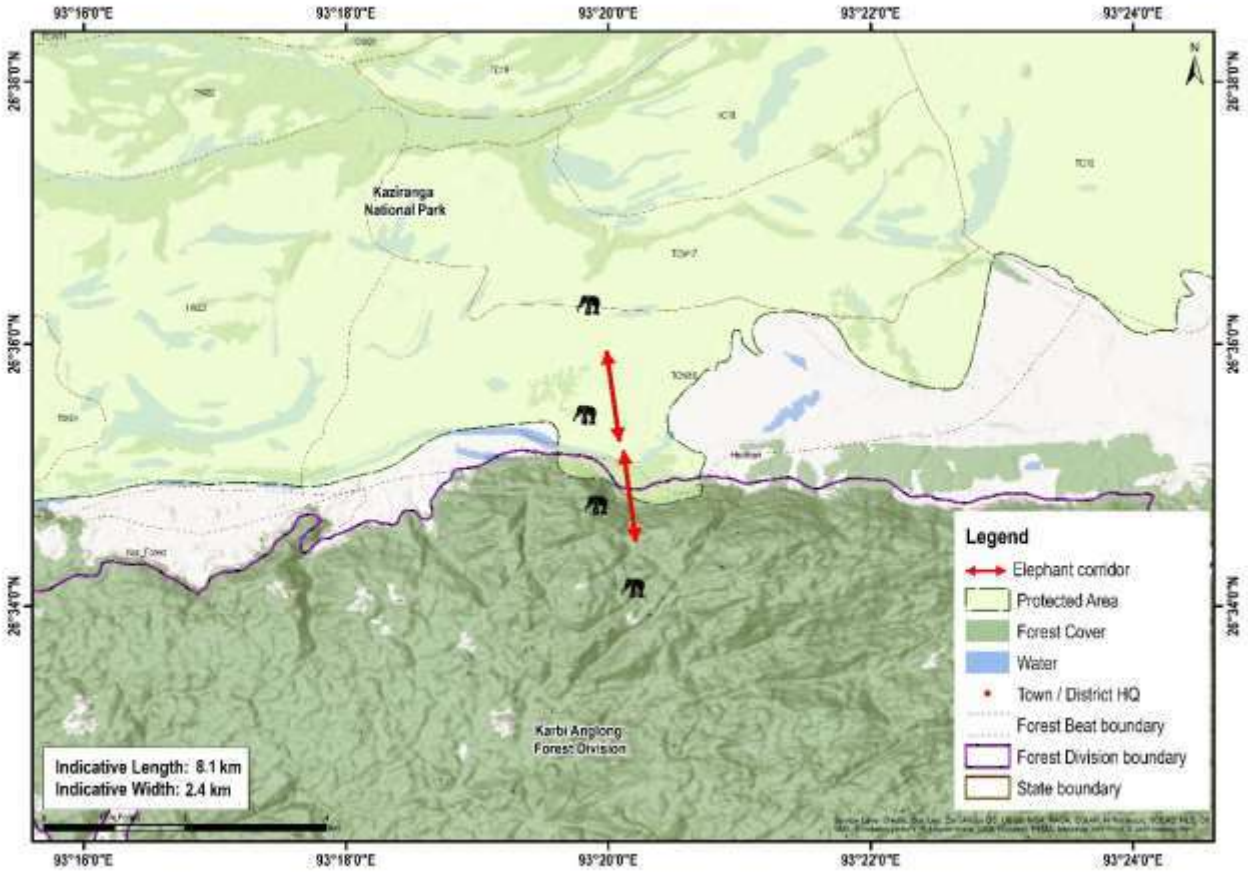
## 16. Hatidandi Corridor

| Connectivity | This corridor connects the elephant habitats of Kaziranga National Park with Karbi Anglong Forest Division |
|---|---|
| State | Assam |
| Indicative length and width | Length = 2.64 km, width = 3.02 km |
| Geo coordinates | N 26º 32'56.741", 26º 33' 40.465"/ E 93º 9' 10.639", 93º 10' 35.068" |
| Forest ranges falling within corridor | Nagaon Range |
| Revenue villages falling within corridor | 1 |
| Administrative details of the corridor | Nagaon Forest Division |
| Ecological importance | The corridor is part of Kaziranga Nationa Park which harbors large number of elephants along with other mega fauna species like one-horned Rhinoceros. |
| Habitat type | Semi Evergreen Forest |
| Major land use | Forest<br>Tea plantation |
| Elephant movement status | Regular |
| Number of elephants using the corridor | Not recorded by forest department |
| Linear infrastructure in the corridor | 1) National Highway- 37, 4 km of road passes through the corridor<br>2) High tension power line (440 V)<br>3) Trench along the tea garden |
| Bottleneck in the corridor | National Highway 37 |
| Recommendations by the forest department to improve the corridor | 1) Prevention of human induces disturbances in and around the corridor.<br>2) Land use change restrictions should be imposed. |
| Current status of the corridor | Active. Intensity of use by elephants decreased. |



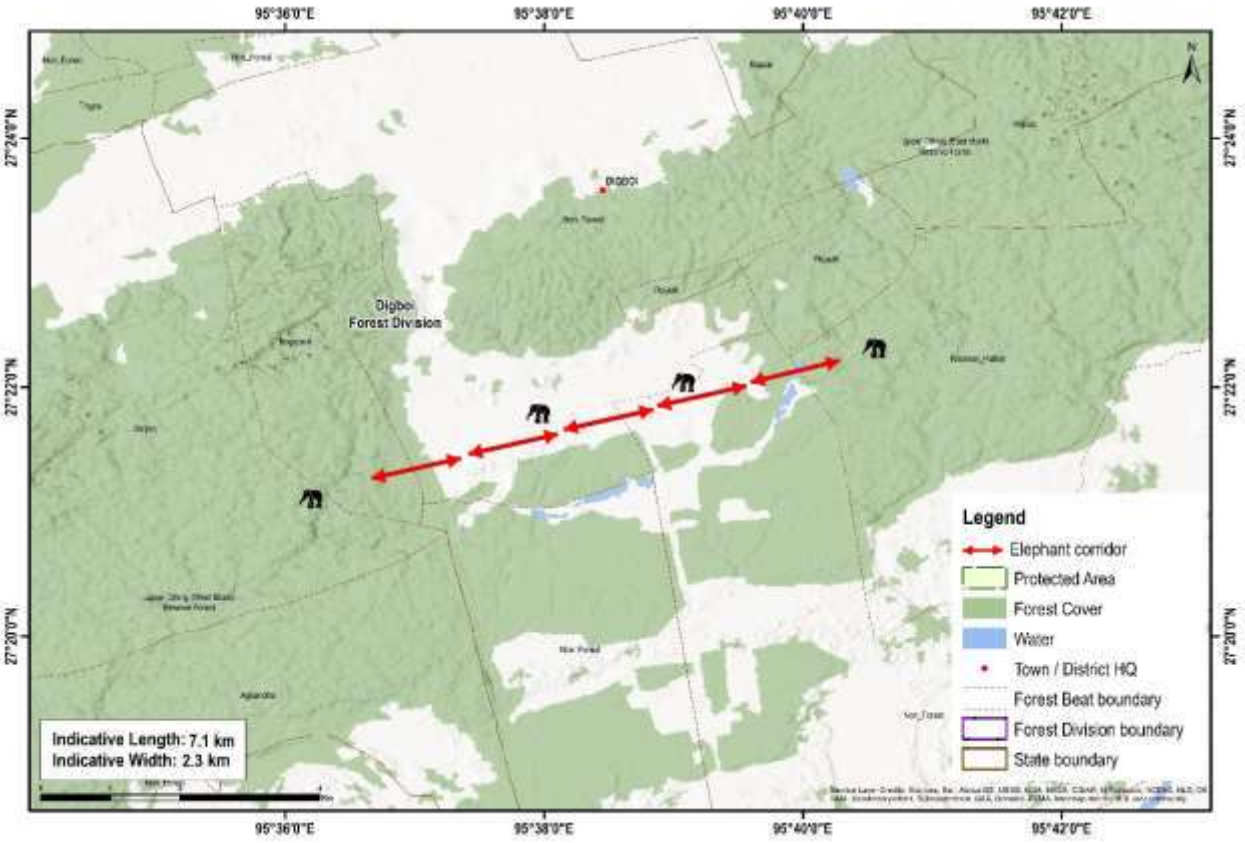
## 17. Haldhibari Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant habitats of Kaziranga National Park in the north with North Karbi Anglong Wildlife Sanctuary and the adjoining community forests of the Karbi Anglong Hills in the south.** |
| **State** | Assam |
| **Indicative length and width** | Length = 8.13 km, width = 2.46 km |
| **Geo coordinates** | N 26° 34'37.063", 26° 34' 54.424"<br>E 93° 17'53.772", 93° 20' 33.037" |
| **Forest ranges falling within corridor** | Central Western Range |
| **Revenue villages falling within corridor** | One |
| **Administrative details of the corridor** | Kaziranga National Park with North Karbi Anglong Wildlife Sanctuary |
| **Ecological importance** | The corridor is part of Kaziranga Nationa Park which harbors large number of elephants along with other mega fauna species like one-horned rhinoceros. |
| **Habitat type** | Tropical Moist Deciduous |
| **Major land use** | Forests |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) National Highway- 37, 7 km of road passes through the corridor<br>2) High vehicular traffic (around 1500 per day) |
| **Recommendations by the forest department to improve the corridor** | 1) Prevention of human induces disturbances in and around the corridor.<br>2) Land use change restrictions should be imposed. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



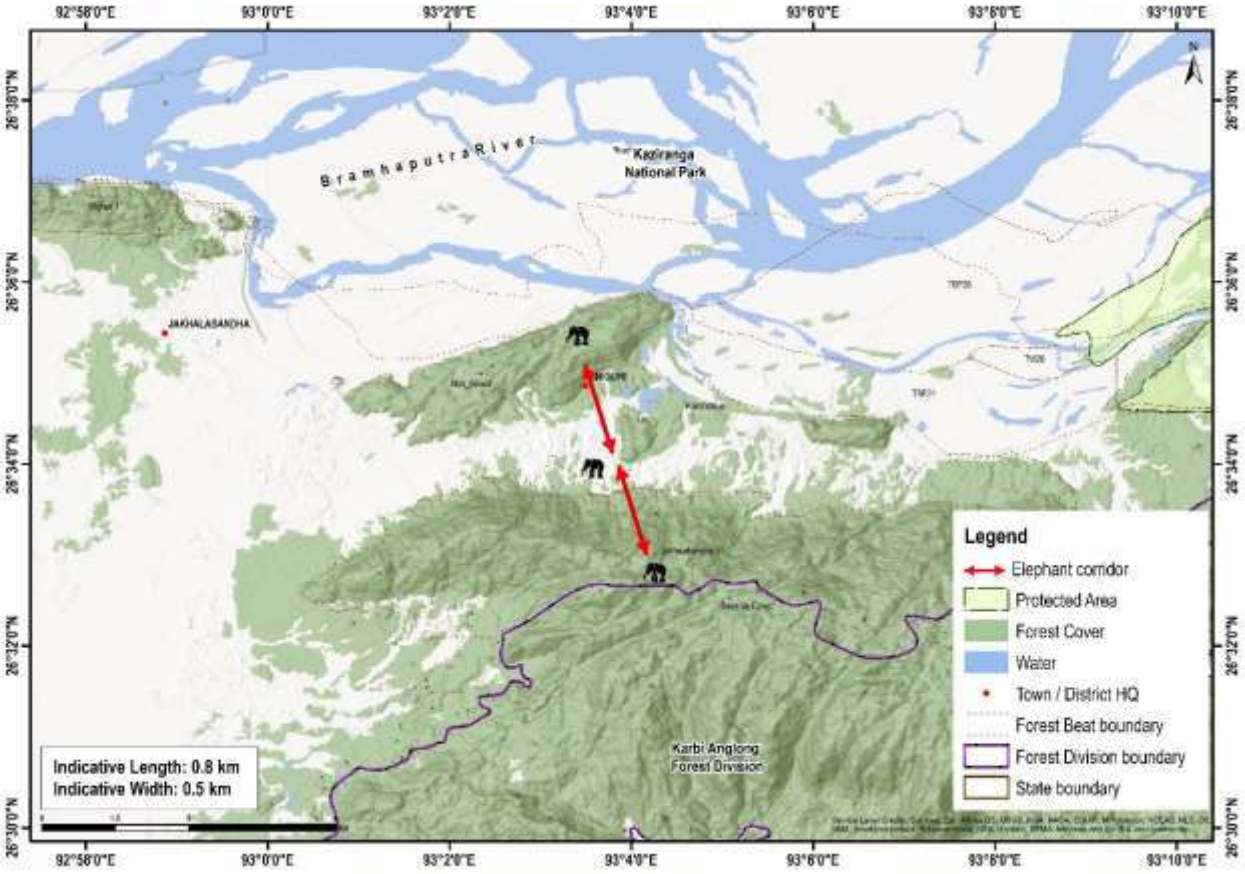
## 18. Golai- Pawai corridor- Upper Dihing East- Upper Dihing West Block Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects the East and West Blocks of Upper Dihing Reserve Forest of Digboi Forest Division.** |
| **State** | Assam |
| **Indicative length and width** | Length = 7.11 km, width = 2.36 km |
| **Geo coordinates** | N 27º 21' 38.416", 27º 21' 38.416"/ E 95º 36' 50.757", 95º 36' 50.757" |
| **Compartments falling within corridor** | Compartment 94 UDRF West Block and 21,22 & 23 Compartment in UDRF, East Block. |
| **Forest ranges falling within corridor** | Digboi, Marghertia West and Margherita East |
| **Revenue villages falling within corridor** | One |
| **Administrative details of the corridor** | Upper Dihing East and West block |
| **Ecological importance** | The corridor helps in the extended movement of elephants to and from Dihing-Patkai Elephant Reserve. |
| **Habitat type** | Tropical Evergreen Forest |
| **Major land use** | Forest<br>Agricultural land<br>Tea plantations |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) IOCL Campus<br>2) National Highway- 38<br>3) Single track non- electrified railway line connecting Tinsukia and Lidu<br>4) Amalgamated Tea company's tea estate |
| **Bottleneck in the corridor** | Tinsukia – Lidu railway track, National Highway 38, and IOCL terminal |
| **Recommendations by the forest department to improve the corridor** | 1) Removal of IOCL Terminus<br>2) Purchasing the private land falling in the corridor.<br>3) Constructing over bridges for the vehicular movement. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



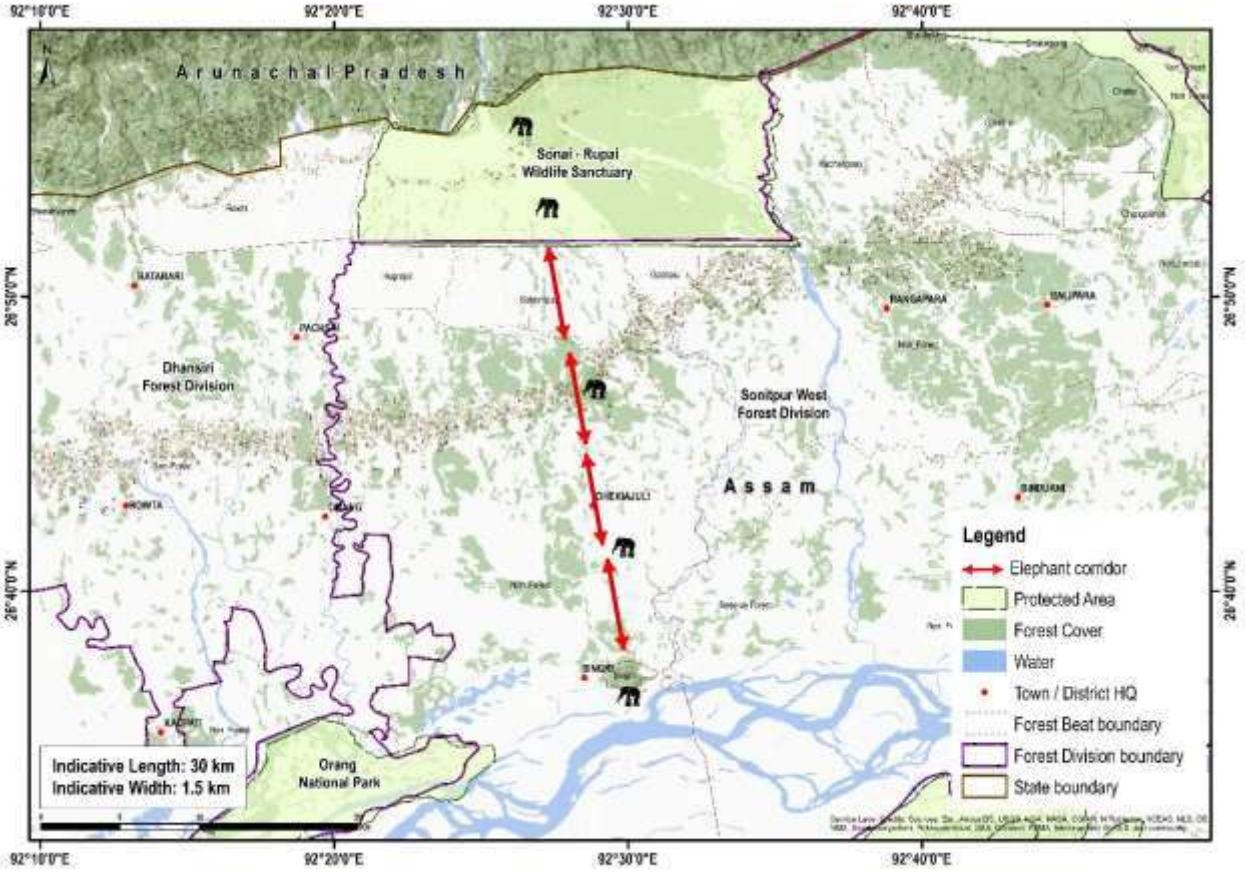
## 19. Kukurakata - Bagser at Amguri Corridor

| | |
|---|---|
| **Connectivity** | **Kaziranga National Park and Kukurakata Reserve Forest with Bagser Reserve Forest and the forest of Karbi Anglong.** |
| **State** | Assam |
| **Indicative length and width** | Length = 0.8 km, width = 0.5 km |
| **Geo coordinates** | 26°34'02"–26°34'04" N<br>93°03'49"–93°04'03" E |
| **Revenue villages falling within corridor** | 1 |
| **Ecological importance** | This corridor used to connect the elephant habitats of Kaziranga National Park and Kukurakata Reserve Forest with Bagser Reserve Forest and the forest of Karbi Anglong. |
| **Habitat type** | Tropical semi-evergreen forest, tea gardens and grassland |
| **Major land use** | Agriculture, tea garden and fores |
| **Elephant movement status** | None |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | 1) National Highway 37 and associated traffic<br>2) School<br>3) Road side dhabas and Hotels |
| **Bottleneck in the corridor** | Highway Road |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the state<br>2) Regulating night traffic along National Highway 37<br>3) Preventing destructive developmental activities<br>4) Relocation of the roadside *dhaba* and hotels outside the corridor |
| **Current status of the corridor** | Impaired |



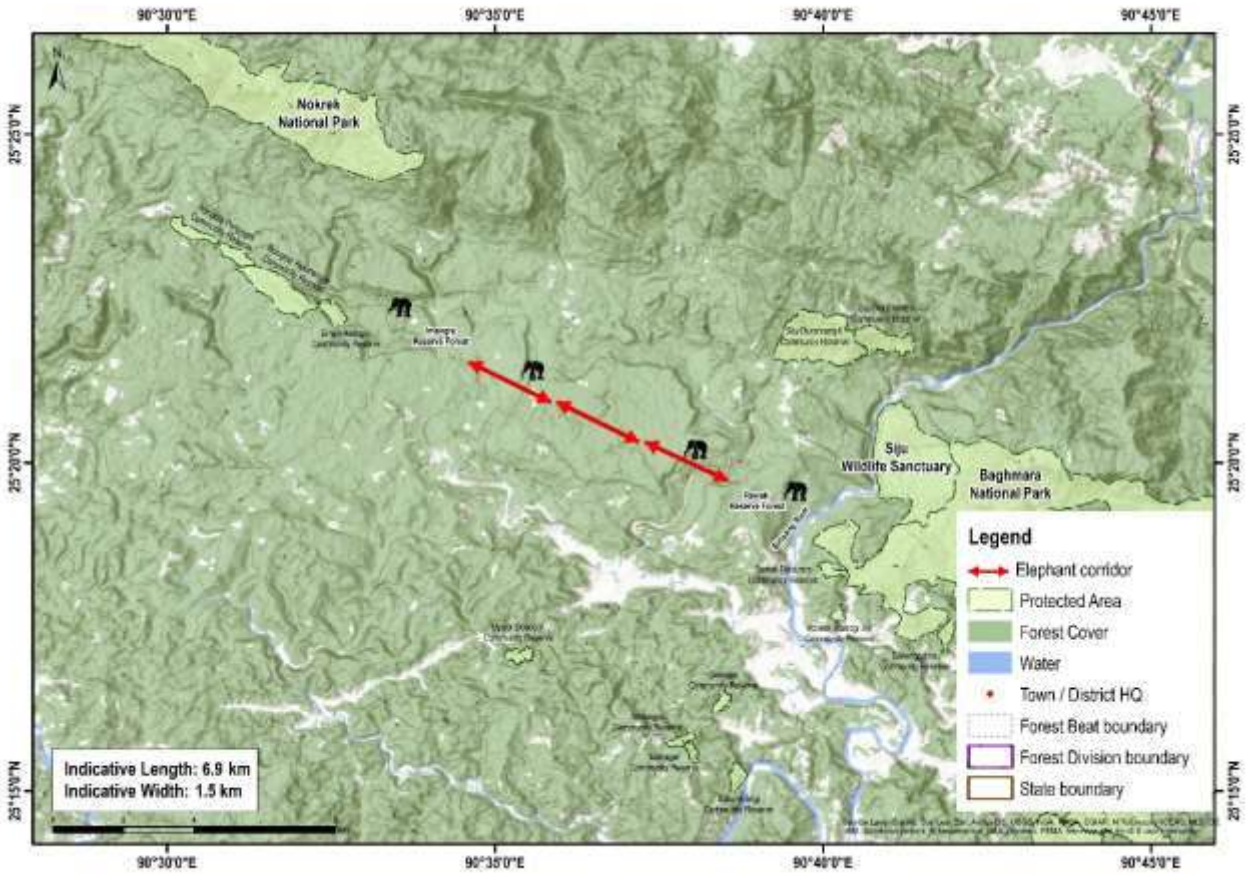
## 20. Charduar - Singri Hill Corridor

| | |
|---|---|
| **Connectivity** | **Sonai Rupai Wildlife Sanctuary and Charduar Reserve Forest and adjoining forests with Singri Hill Reserve Forest.** |
| **State** | Assam |
| **Indicative length and width** | Length = 30 km, width = 1.5 km |
| **Geo coordinates** | 26°36'41"–26°48'39" N<br>92°26'58"–92°29'37" E |
| **Revenue villages falling within corridor** | 8 |
| **Habitat type** | Tropical deciduous forest |
| **Major land use** | Agriculture, settlement and tea gardens |
| **Elephant movement status** | None |
| **Number of elephants using the corridor** | None |
| **Linear infrastructure in the corridor** | National Highway 52 (Guwahati to North Lakhimpur) |
| **Bottleneck in the corridor** | National Highway 52 (Guwahati to North Lakhimpur) |
| **Recommendations by the forest department to improve the corridor** | 1) Declaration, demarcation and legal protection of the corridor under various laws appropriate for the state<br>2) Lobbying with tea gardens to leave a part of the land for easy movement of elephants and prevention of change of land-use pattern in these tea gardens |
| **Current status of the corridor** | Impaired |



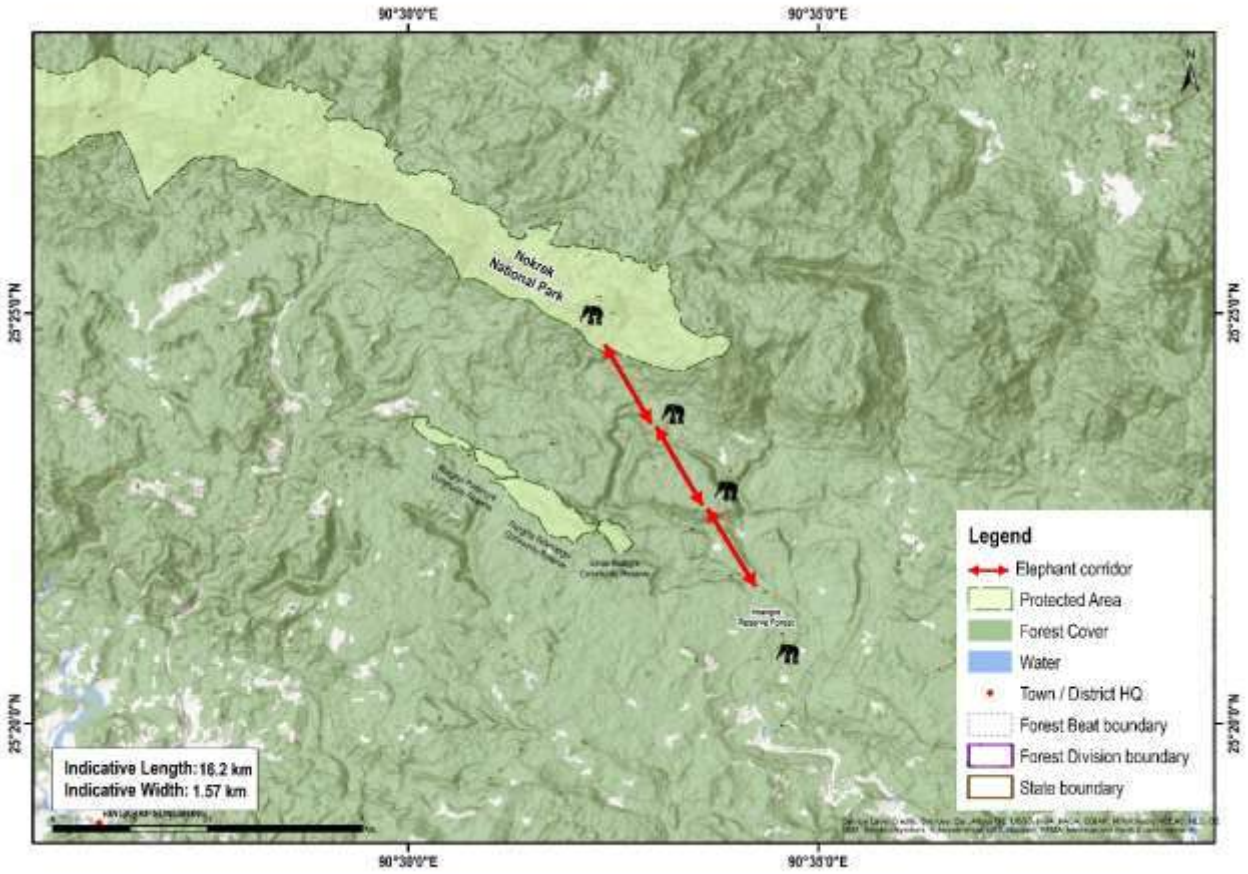
## 21. Rewak- Emangre Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Emangre Reserve Forest to Nokrek National Park. The corridor falls under South Garo Hills district under Siju Block and under Siju Wildlife Range and Baghmara Wildlife Range** |
| **State** | Meghalaya |
| **Indicative length and width** | Length = 6.90 km, Width = 1.57 km |
| **Geo coordinates** | 25º 19' 47" N, 90º 39' 14.98" E<br>25º 20' 38.25" N, 90º 35' 17.70" E |
| **Forest ranges falling within corridor** | Siju and Baghmara Ranges |
| **Revenue villages falling within corridor** | 8 |
| **Habitat type** | Tropical deciduous, semi-evergreen forest |
| **Major land use** | Forest = 419 ha<br>Agriculture = 280.4 ha<br>Habitation = 92.6 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 19 |
| **Linear infrastructure in the corridor** | Local roads and a low hanging power line (35 Kv) |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



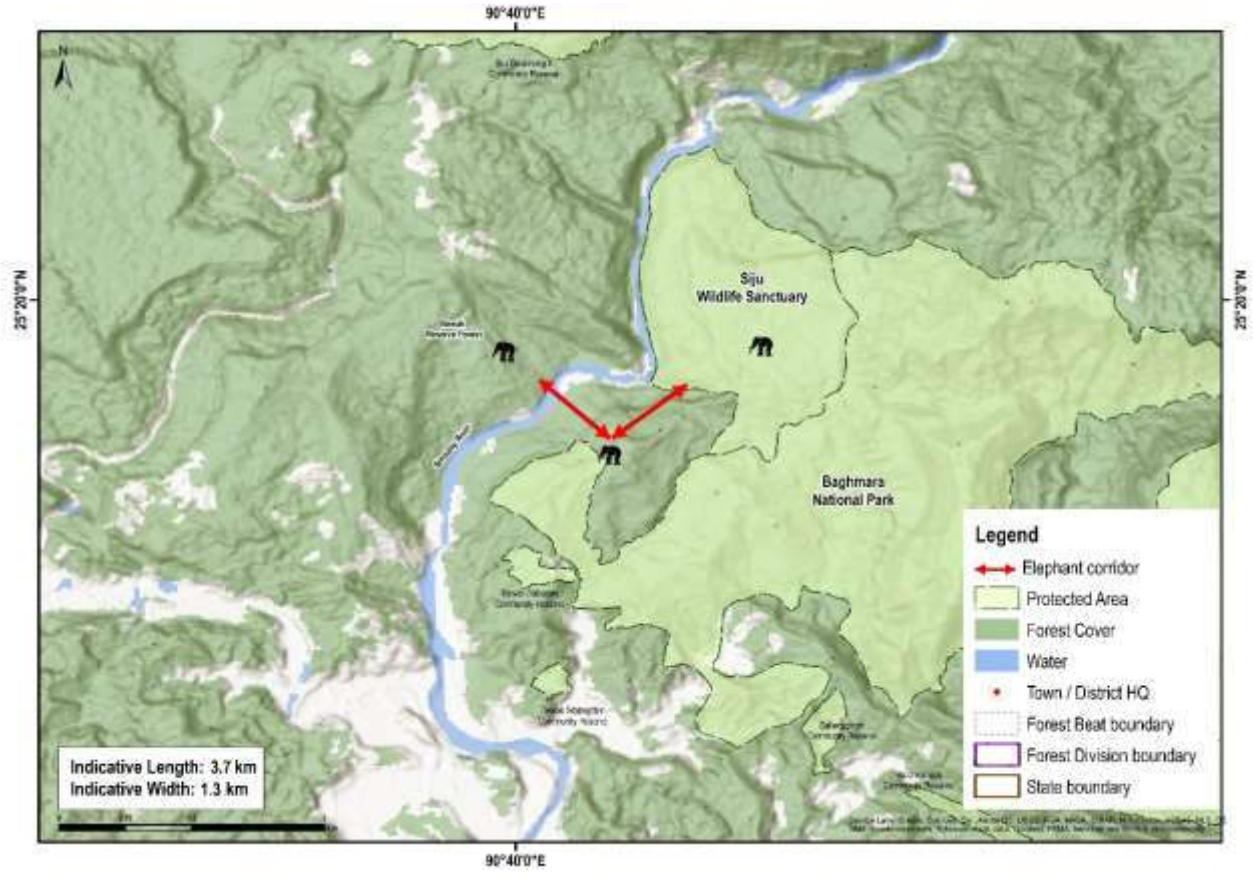
## 22. Nokrek- Emangre Corridor

| | |
|---|---|
| **Connectivity** | **The corridor connects Emangre Reserve Forest with Nokrek National Park. The corridor falls in the West and South Garo Hills district under Rongram, Chokpot and Siju Block and under Nokrek Wildlife Range and Baghmara Wildlife Range.** |
| **State** | Meghalaya |
| **Indicative length and width** | Length = 16.2 km, width = 1.57 km |
| **Geo coordinates** | 25º 26'49.49" N, 90º 27'54.14" E<br>25º 21'14.51" N, 90º 32'22.84" E |
| **Forest ranges falling within corridor** | Nokrek and Baghmara Ranges |
| **Revenue villages falling within corridor** | 15 |
| **Habitat type** | Tropical deciduous, semi-evergreen forest |
| **Major land use** | Forest = 1099 ha<br>Agriculture = 452 ha<br>Habitation = 189 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Local roads and a low hanging power line (35 Kv) |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



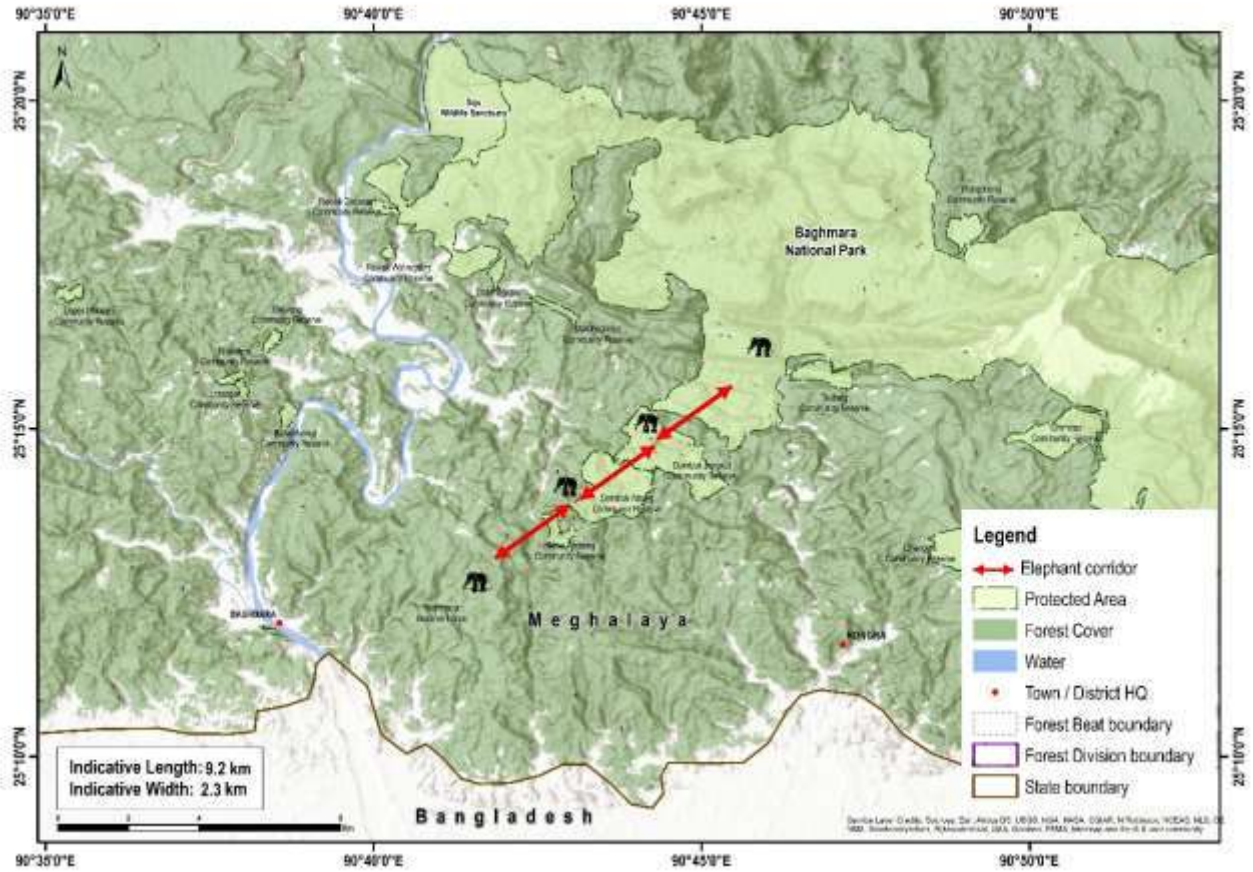
## 23. Siju- Rewak Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Siju Wildlife Sanctuary with Rewak Reserve and helps maintain the habitat continuity between Balpakram National Park, Siju Wildlife Sanctuary, Rewak and Emangre Reserve Forests, and Nokrek National Park. The corridor falls in the South Garo Hills district under Siju Block and under Siju Wildlife Range.** |
| **State** | Meghalaya |
| **Indicative length and width** | Length = 3.78 km, width = 1.38 km |
| **Geo coordinates** | 25º 19'42.33" N / 90º 41'24.60" E<br>25º 19' 53.26" N / 90º |
| **Forest ranges falling within corridor** | Siju Range |
| **Revenue villages falling within corridor** | 12 |
| **Ecological importance** | The corridor is also regularly used by elephants and other wildlife. The corridor is also an extension to the biodiversity rich Nokrek National Park |
| **Habitat type** | Tropical deciduous, semi-evergreen forest |
| **Major land use** | Forest = 184 ha<br>Agriculture = 24.1 ha<br>Habitation = 1.90 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 39 |
| **Linear infrastructure in the corridor** | 1) National Highway 62, 1.41 km of the road passes through the corridor<br>2) Low hanging power line (35 Kv) |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



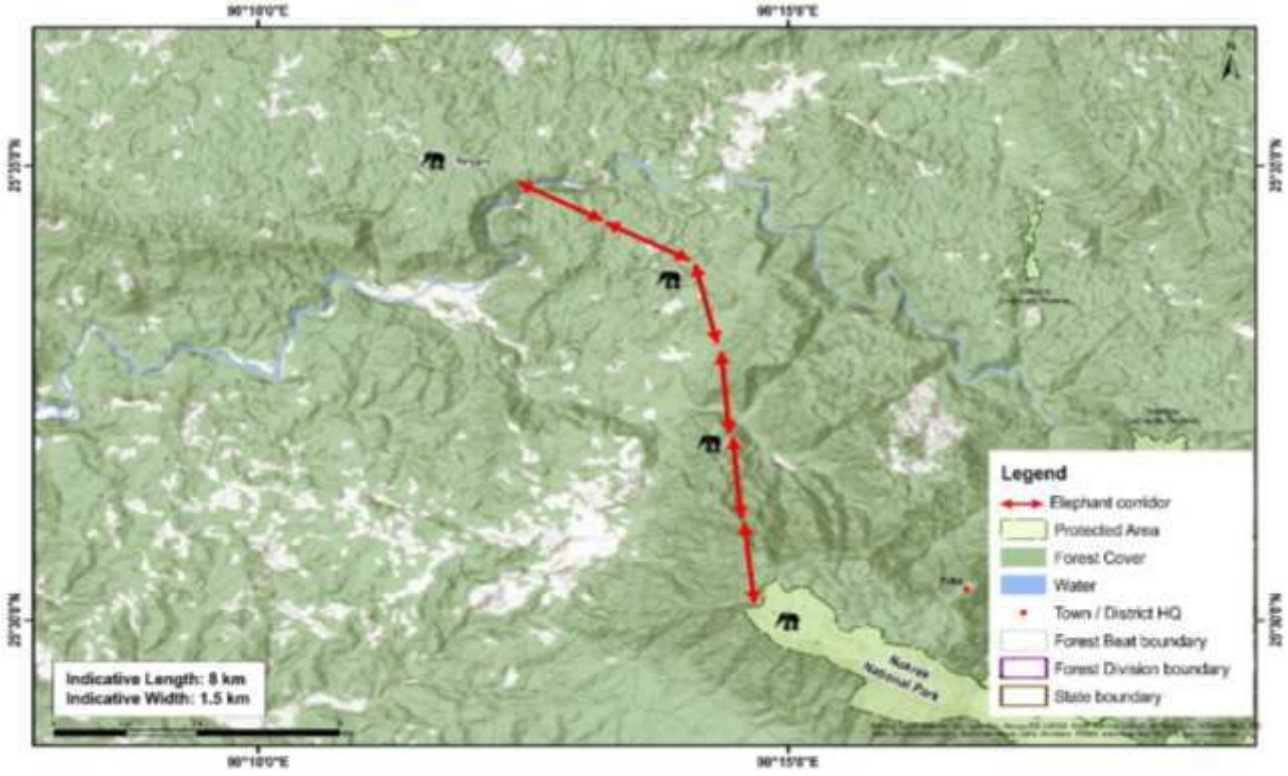
## 24. Balpakram- Baghmara

| | |
|---|---|
| **Connectivity** | **This corridor connects the Mahadeo Range in Balpakram National Park with Baghmara Reserve Forest. The corridor falls South Garo Hills district under Rongara Block and under Mahadeo Wildlife Range and Baghmara Wildlife Range** |
| **State** | Meghalaya |
| **Indicative length and width** | Length = 9.27 km, width = 2.30 km |
| **Geo coordinates** | 25º 14.755" N / 90º 44.329" E |
| **Forest ranges falling within corridor** | Mahadeo and Baghmara Ranges |
| **Revenue villages falling within corridor** | Ten |
| **Ecological importance** | The corridor is an important for connectivity between Balpakram National Park and Baghmara Reserved Forest and used by other wildlife including wild ungulates and leopard (*Panthera pardus*). |
| **Habitat type** | Tropical deciduous, semi-evergreen forest |
| **Major land use** | Forest = 1098 ha<br>Agriculture = 161.1 ha<br>Habitation = 20.9 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 68 |
| **Linear infrastructure in the corridor** | 1) State Highway 4, 3.75 km of the road passes through the corridor<br>2) Low hanging power line (35 Kv) |
| **Recommendations by the forest department to improve the corridor** | Information NA |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



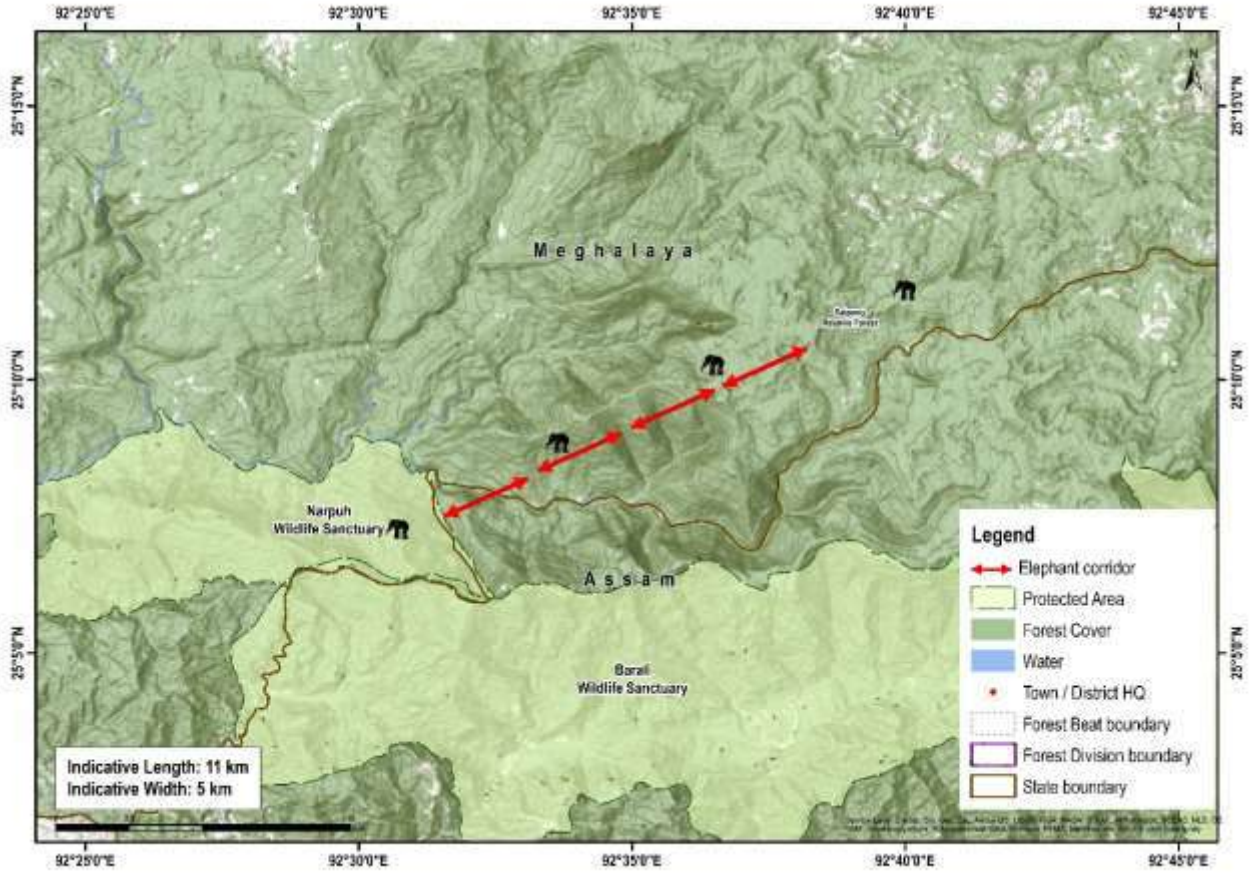
## 25. Ranggira- Nokrek Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Ranggira, Sanchangiri and Galwang Reserve Forest to Nokrek National Park** |
| **State** | Meghalaya |
| **Indicative length and width** | Length = 8 km, width = 1.5 km |
| **Geo coordinates** | 25º 30' 5" N / 90º 12' 3" E<br>25º 34' 59" N / 90º 15'10" E |
| **Forest ranges falling within corridor** | Tura |
| **Revenue villages falling within corridor** | Ten |
| **Ecological importance** | This corridor is very critical for movement of elephants and other wildlife from Ranggira to Nokrek National Park. |
| **Habitat type** | Tropical evergreen forest |
| **Major land use** | Forest<br>Agriculture<br>Plantation (tea/coffee)<br>Settlement |
| **Elephant movement status** | Occasional, but not through the corridor. |
| **Number of elephants using the corridor** | 40-50 in the past, but not now. |
| **Linear infrastructure in the corridor** | 1) National Highway- 51 and Asanang- Williamnagar Road<br>2) High tension powerline (11 kv and 33 kv)<br>3) NEHU Campus<br>4) Garo student union building<br>5) 2nd Police battalion |
| **Major bottleneck** | Establishment of NEHU campus, Garo students union building, fishery pond, 2nd Police battalion, and expansion of human settlements and horticultural crops |
| **Recommendations by the forest department to improve the corridor** | 1) State forest department should secure land on the other side of the road to NEHU campus to provide 500 m width to the corridor<br>2) Legal protection of the corridor area<br>3) Negotiation with NEHU authorities to spare about 44 ha of land near the hostel area for elephant movement<br>4) The Garo Students Union building (now school) has to be relocated to an alternate site outside the corridor |
| **Current status of the corridor** | Impaired |



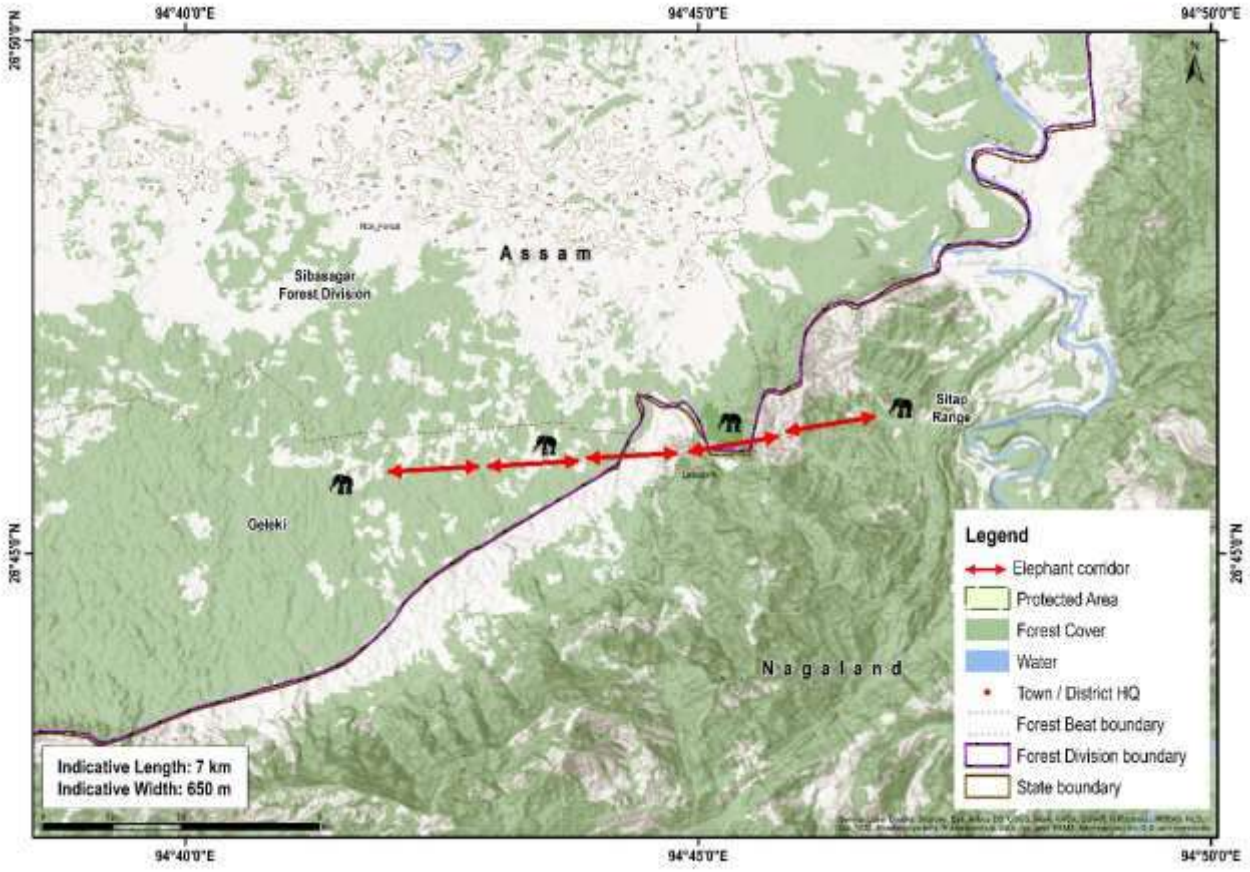
## 26. Saipung- Narpuh Corridor

| Connectivity | This corridor connects Saipung Reserve Forest and Narpuh Wildlife Sanctuary |
|---|---|
| State | Meghalaya |
| Indicative length and width | Length =11 km, width = 4-5 km |
| Geo coordinates | 25º 6' N / 92º 30' E<br>25º 15' N / 92º 41' E |
| Forest ranges falling within corridor | Saipung and Narpuh Ranges |
| Revenue villages falling within corridor | 2 |
| Habitat type | Tropical mixed evergreen |
| Major land use | Forests, Agricultural land and Settlements |
| Elephant movement status | None, last elephant seen in 2001 |
| Number of elephants using the corridor | None |
| Linear infrastructure in the corridor | Information NA |
| Major bottleneck | Information NA |
| Recommendations by the forest department to improve the corridor | Information NA |
| Current status of the corridor | Impaired |



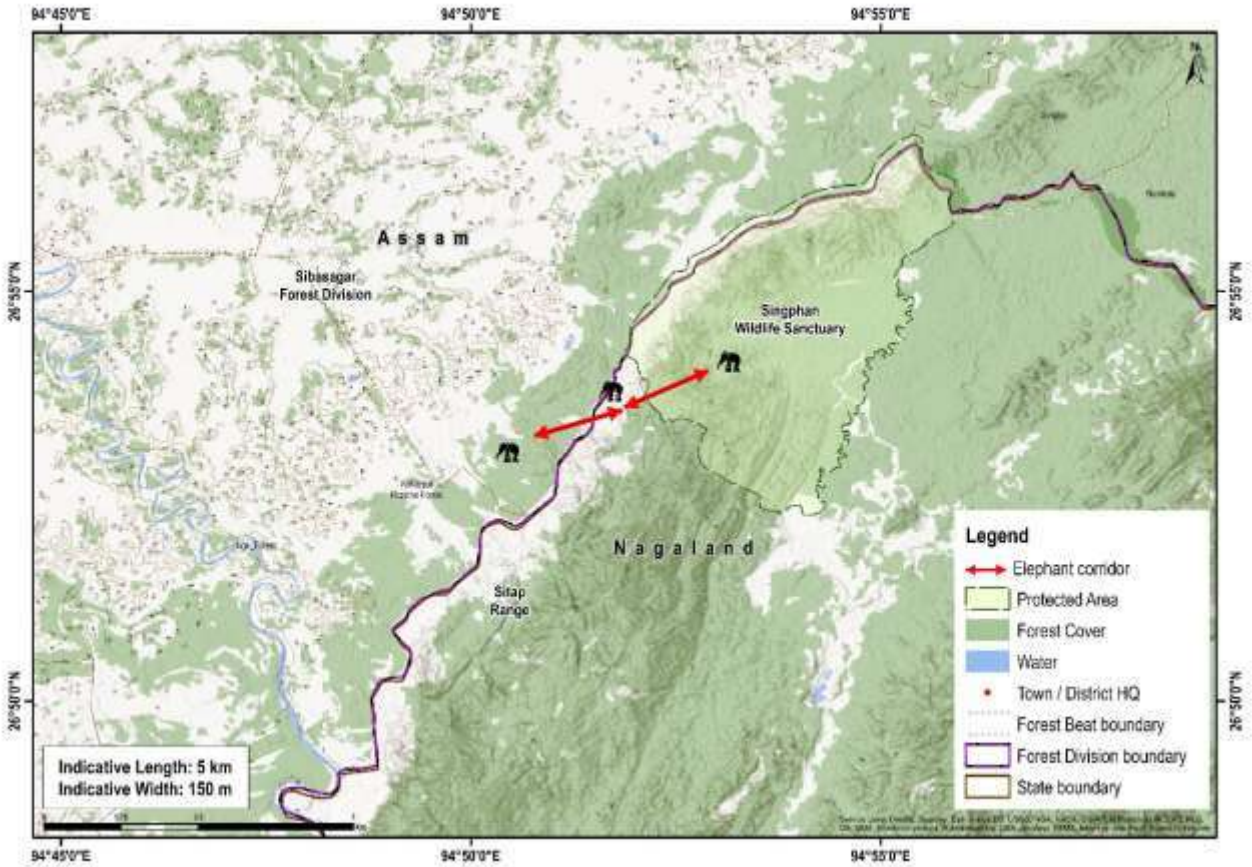
## 27. Geleki- Sitap corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant populations Geleki Reserve Forest to Sitap range** |
| **State** | Nagaland |
| **Indicative length and width** | Length = 7 km, width = 110 m - 650 m |
| **Geo coordinates** | 26° 47' 02" N, 94° 46' 22" E |
| **Forest ranges falling within corridor** | Galeki and Sitap range |
| **Revenue villages falling within corridor** | 8 |
| **Administrative details of the corridor** | Longleng district |
| **Ecological importance** | Unexplored biodiversity. Corridor is used by animals like Himalayan black bear (*Ursus thibetanus*), leopard (*Panthera pardus*), tiger (*Panthera tigris*) and others. |
| **Habitat type** | Hilly semi evergreen tropical forest |
| **Major land use** | Forest<br>Agriculture<br>Plantation<br>Settlement |
| **Elephant movement status** | Seasonal |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department** | 1. Proper survey of corridor is required. No such attempts were made earlier.<br>2. Systematic use of land prioritizing conservation is needed.<br>3. Sensitization and awareness programs<br>4. Creation of salt licks |
| **Status of the corridor** | Active. Intensity of use by elephants decreased. |



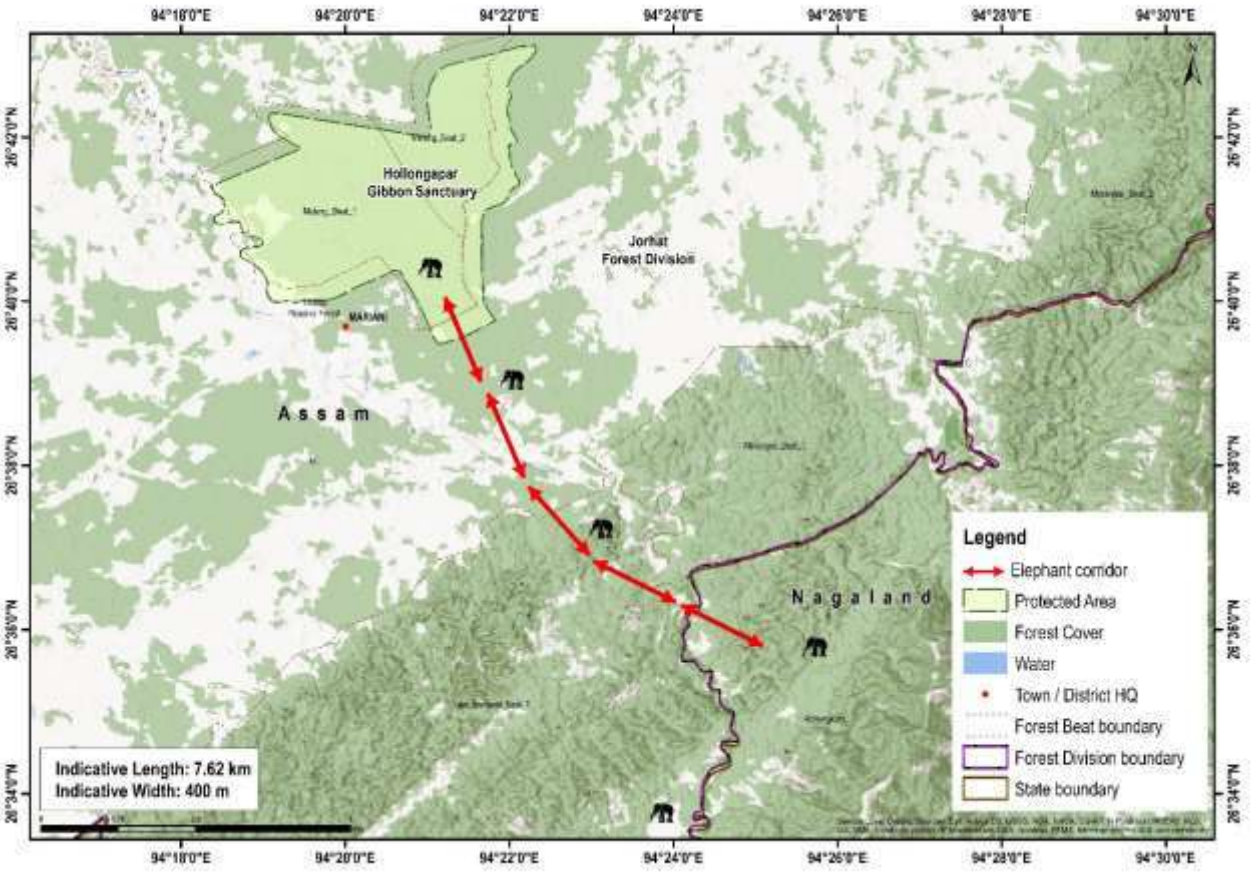
## 28. Abhaypur- Singphan corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Mon of Singhpan Wildlife Sanctuary in Nagaland with Abhaypur Reserve Forest in Sonari Forest Division of Assam across Tiru River. Corridor falls within the Singhpan Wildlife Sanctuary in Mon District.** |
| **State** | Nagaland |
| **Indicative length and width** | Length = 5 km, Width = 150 m |
| **Geo coordinates** | Lat = 26. 856923 / Lon = 94.863468 |
| **Forest ranges falling within corridor** | Abhaypur RF |
| **Revenue villages falling within corridor** | Nine |
| **Ecological importance** | Singphan Wildlife Sanctuary is home to rare and endangered flora species along with elephant, tigers (*Panthera tigris*), leopards (*Panthera pardus*), hoolock gibbon (*Hoolock hoolock*) and other wildlife. |
| **Habitat type** | Tropical semi-evergreen |
| **Major land use** | Forest |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 45 |
| **Linear infrastructure in the corridor** | Village road- 8 km |
| **Recommendations by the forest department to improve the corridor** | 1. Removal of mining road passing through Singhpan wildlife sanctuary.<br>2. Increase in wildlife staff<br>3. Fund release for compensation<br>4. Ecological restoration of the lost forest cover |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



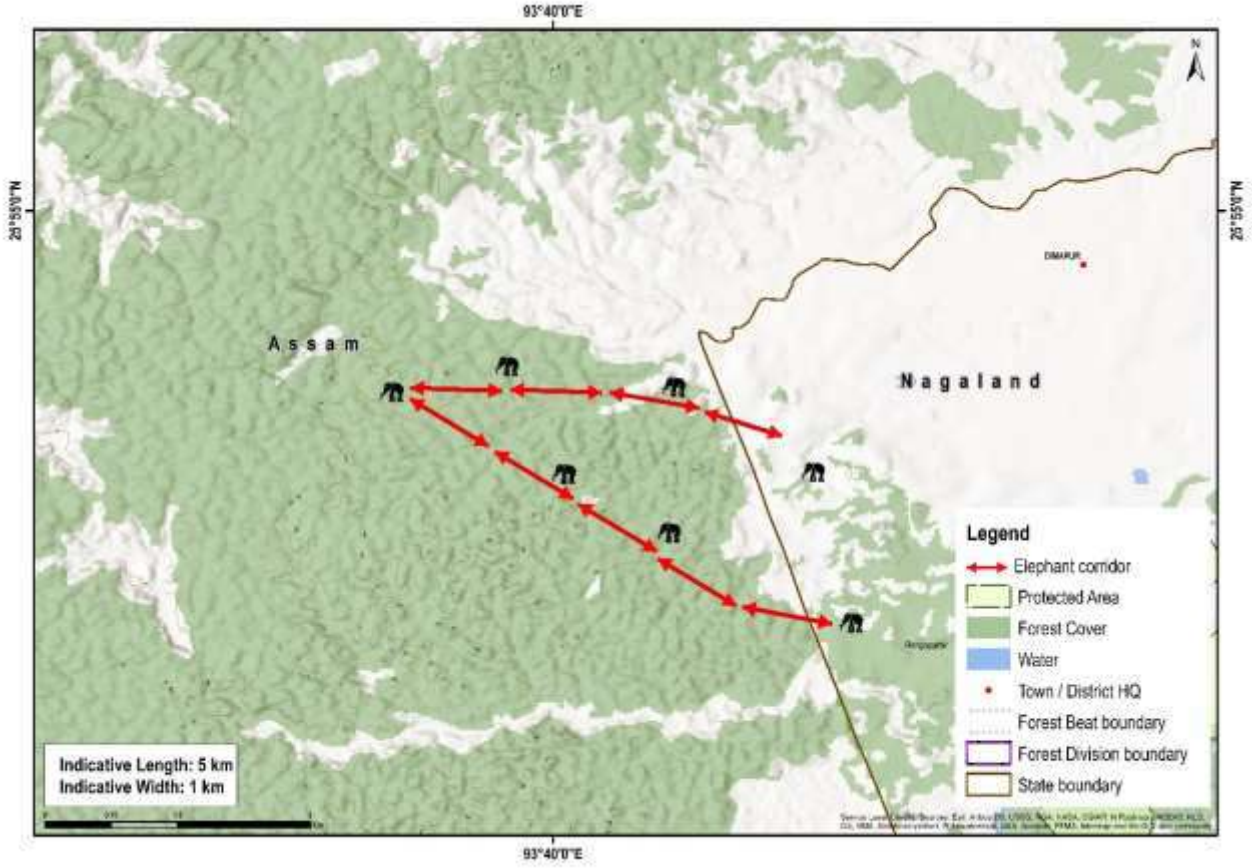
## 29. Hollongapar- Longtho corridor

| Connectivity | Meleng Reserve forest, Hollongapar Gibbon Sanctuary to Longtho Range |
|---|---|
| State | Nagaland |
| Indicative length and width | Length = 7.62 km, width = 400 m |
| Geo coordinates | 26° 36' 03" N / 94° 23' 21" E |
| Forest ranges falling within corridor | Longtho range |
| Revenue villages falling within corridor | 3 |
| Ecological importance | Corridor is possibly used by species including hoolock gibbon (*Hoolock hoolock*), slow loris (*Nycticebus bengalensis*), leopard (*Panthera pardus*), stump-tailed macaque (*Macaca arctoides*), pig-tailed macaque (*Macaca leonine*), Assamese macaque (*Macaca assamensis*) among others. |
| Habitat type | Tropical wet evergreen, wet temperate, secondary moist bamboo forest |
| Major land use | Forest (mostly under private and community forests)<br>Agricultural land<br>Plantations<br>Settlements |
| Elephant movement status | Seasonal |
| Number of elephants using the corridor | 40 |
| Linear infrastructure in the corridor | National Highway |
| Recommendations by the forest department to improve the corridor | 1) Ecological restoration of the lost forest cover<br>2) Awareness and sensitization programs |
| Current status of the corridor | Active. Intensity of use by elephants decreased. |



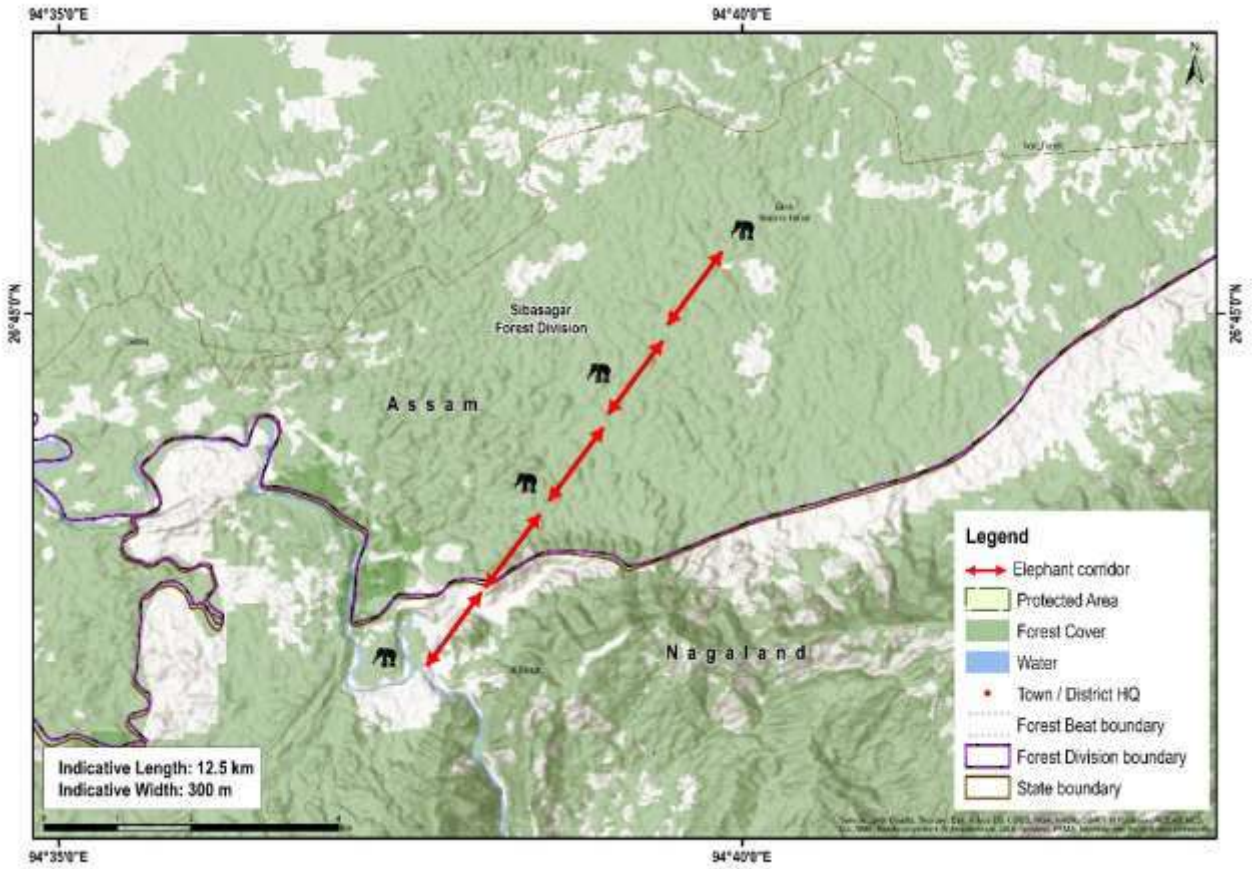
## 30. Daldali- Dimapur corridor

| Connectivity | This corridor connects the Daldali Reserved Forest to Dimapur Reserve Forest in the Dimapur district. |
|---|---|
| **State** | Nagaland |
| **Indicative length and width** | Length = 5 km, width = 1 km |
| **Geo coordinates** | 25º 53' 33" N / 94º 40' 42" E |
| **Forest ranges falling within corridor** | Ranga Pahar and Kuhuboto ranges |
| **Revenue villages falling within corridor** | 5 |
| **Ecological importance** | Elephants and other wildlife including leopard (*Panthera pardus*) and dhole (*Cuon alpinus*) use this corridor. |
| **Habitat type** | Tropical wet evergreen forest |
| **Major land use** | Forest (Private and community conservation areas, Daldali RF)<br>Agriculture<br>Plantations<br>Settlement |
| **Elephant movement status** | Occasional |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | Information NA |
| **Major bottleneck in the corridor** | Indisen and Aryimkum areas falling within corridor |
| **Recommendations by the forest department to improve the corridor** | Awareness and sensitization programs to local communities |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



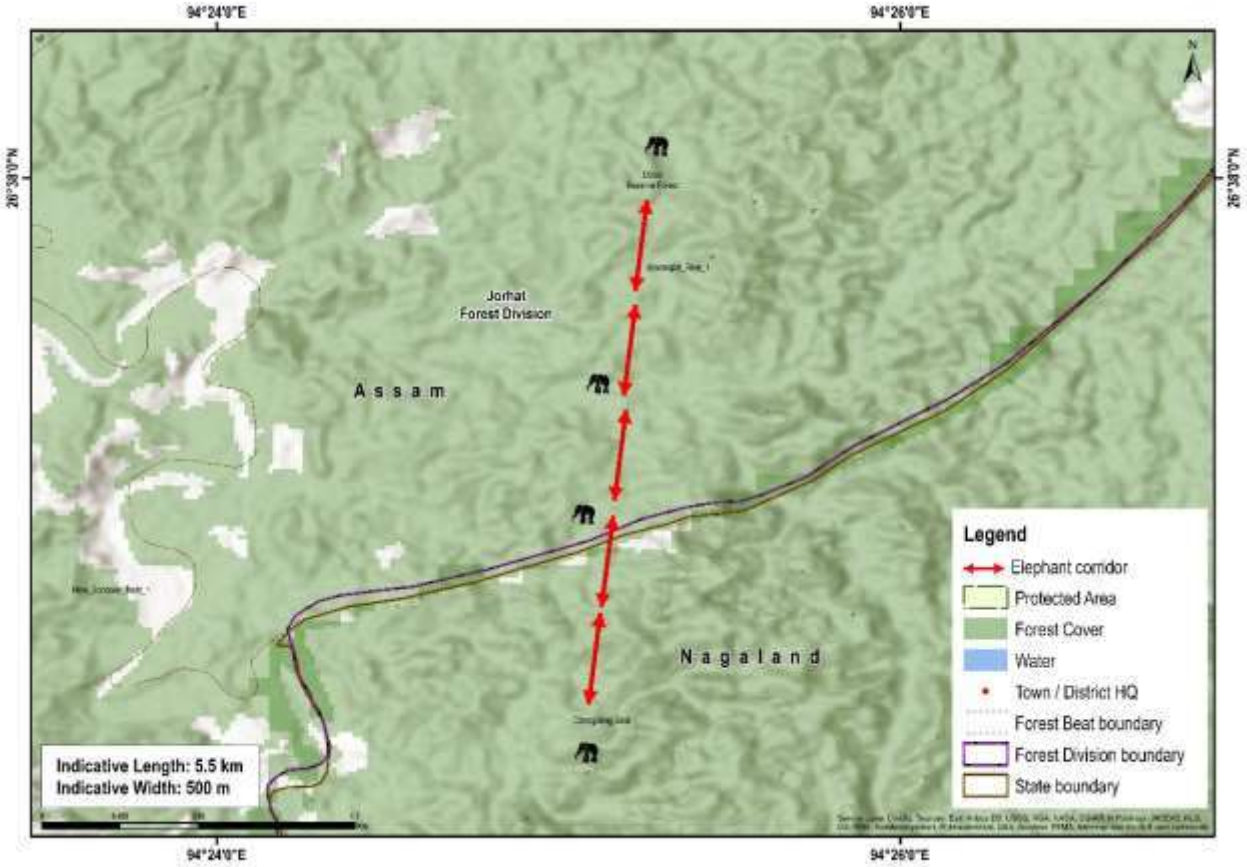
## 31. Geleki- Tuli corridor

| Connectivity | Geleki Reserve Forest to Tuli Range Forest Division of Dimapur district. |
|---|---|
| State | Nagaland |
| Indicative length and width | Length = 12.5 km, width = 300 m |
| Geo coordinates | 26° 43' 38" N / 94° 40' 02" |
| Forest ranges falling within corridor | Tuli range |
| Revenue villages falling within corridor | 7 |
| Administrative details of the corridor | Dimapur district |
| Ecological importance | Besides elephants, tigers (*Panthera tigris*) and leopards (*Panthera pardus*) also use this corridor. |
| Habitat type | Tropical wet evergreen and bamboo-dominated forests |
| Major land use | Forest (private forests and community conservation areas)<br>Agriculture<br>Plantation (rubber + tea) |
| Elephant movement status | Seasonal |
| Number of elephants using the corridor | 2 (as on 2022) |
| Linear infrastructure in the corridor | National highway |
| Major bottleneck in the corridor | Teudikong, Wamaken, and Anaki Yimsen in the corridor due to mining and infrastructure |
| Recommendations by the forest department to improve the corridor | 1) Awareness and sensitization programs<br>2) Engagement with the Community Conservation Areas (CCA) to prevent further fragmentation of forests<br>3) Training of the forest staff for timely monitoring of the corridor areas. |
| Current status of the corridor | Active. Intensity of use by elephants decreased. |



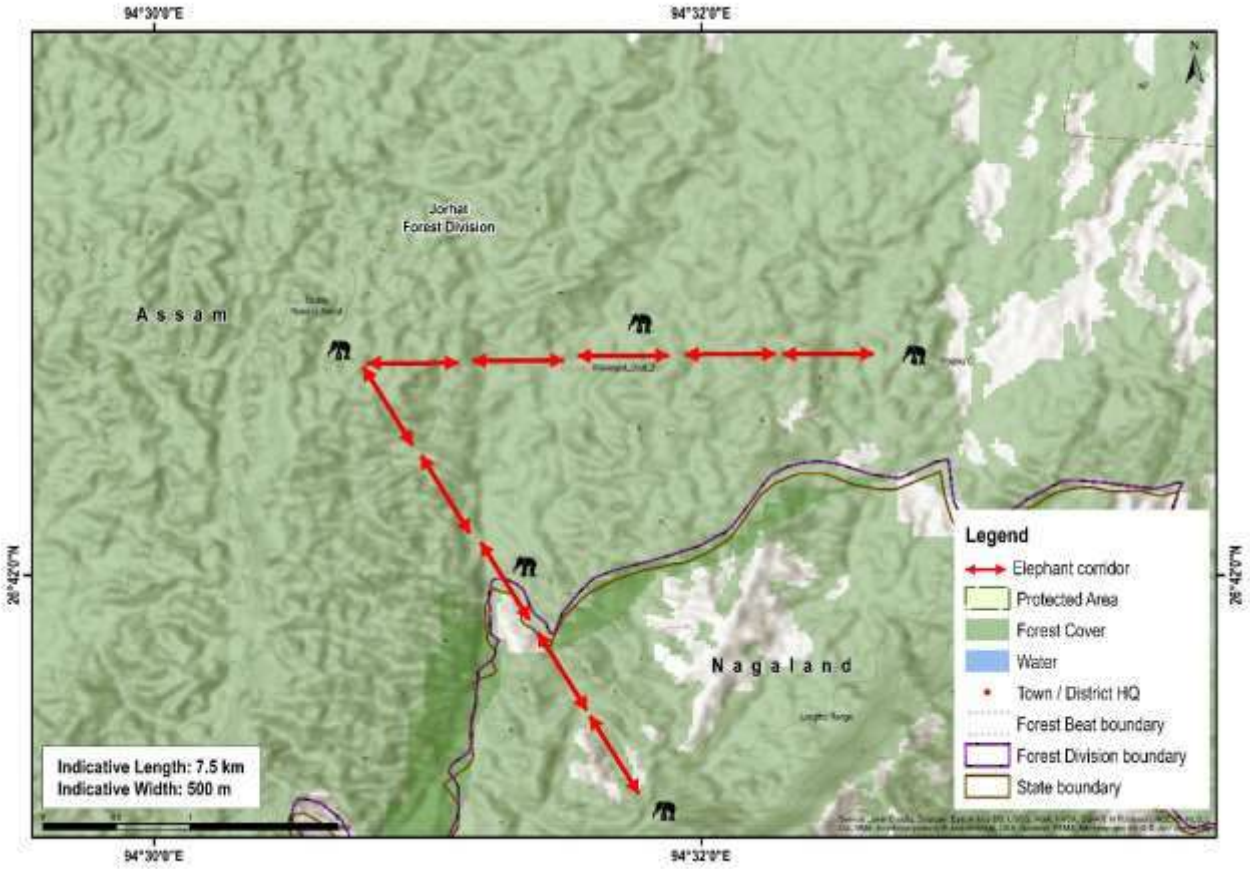
## 32. Desoi- Changdang corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Changdang beat of the Desoi Reserve Forest to Longchem Range in the Mokokchung district** |
| **State** | Nagaland |
| **Indicative length and width** | Length = 5.5 km, width = 300 m |
| **Geo coordinates** | 26° 36' 41" N / 94° 25' 49" E |
| **Forest ranges falling within corridor** | Longchem range |
| **Revenue villages falling within corridor** | 10 |
| **Ecological importance** | Elephants and wildlife like tiger (*Panthera tigris*), dhole (*Cuon alpinus*), leopard (*Panthera pardus*) and Himalayan black bear (*Ursus thibetanus*) use this corridor |
| **Habitat type** | Eastern Himalayan moist mixed deciduous, Naga Hills wet temperate and montane forest |
| **Major land use** | Forest (private and community forests)<br>Agricultural land<br>Plantations<br>Settlements |
| **Elephant movement status** | Seasonal |
| **Number of elephants using the corridor** | 20 - 30 |
| **Linear infrastructure in the corridor** | Information NA |
| **Recommendations by the forest department** | 1. Engagement with the Community Conservation Areas (CCA) to prevent further fragmentation of forests<br>2. Awareness and sensitization programs<br>3. Training of the forest staff for timely monitoring of the corridor areas.<br>4. Constructing a few forest offices for monitoring purposes. |
| **Status of the corridor** | Active. Intensity of use by elephants decreased. |



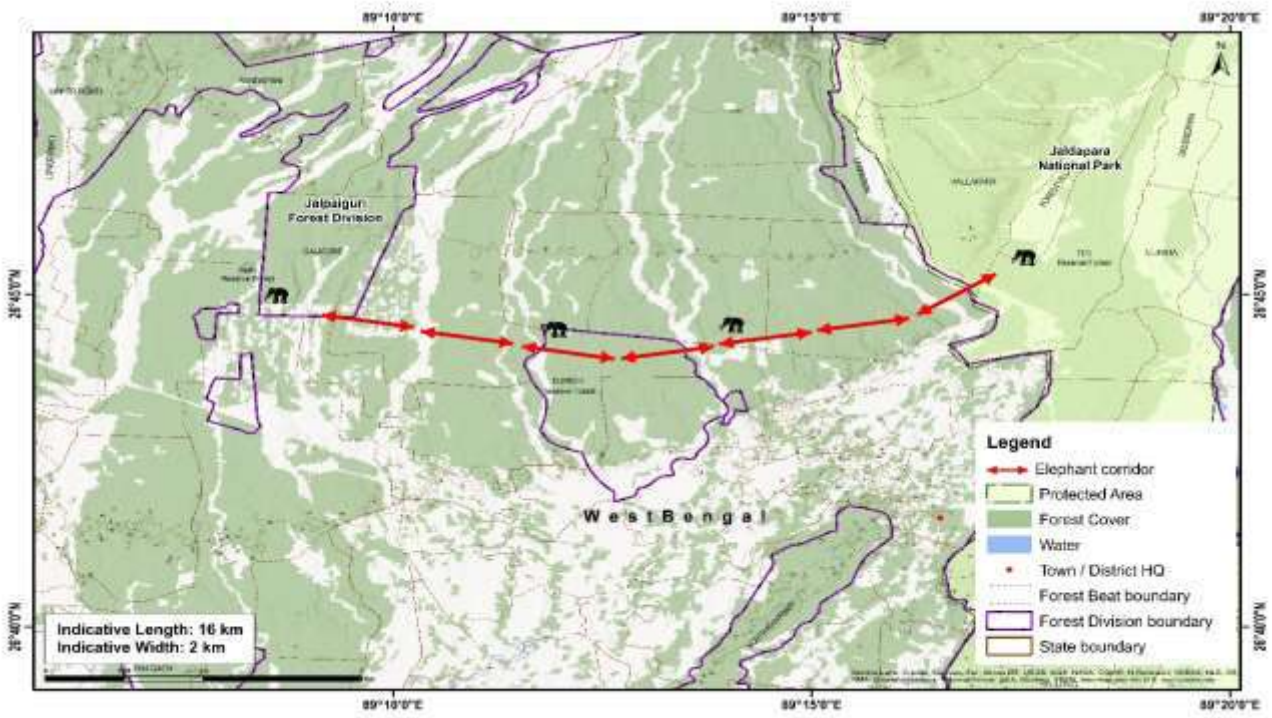
## 33. Tirutilip- Longchem

| | |
|---|---|
| **Connectivity** | **This corridor connects the Tirutilip Reserve Forest with the Longchem Range in the Mokokchung District.** |
| **State** | Nagaland |
| **Indicative length and width** | Length = 7.5 km, width = 500 m |
| **Geo coordinates** | 26° 41' 38" N / 94° 31' 07" E |
| **Forest ranges falling within corridor** | Longhem range |
| **Revenue villages falling within corridor** | 5 |
| **Administrative details of the corridor** | Changdang beat, Longchem Range |
| **Ecological importance** | Elephants and wildlife like tiger (*Panthera tigris*), dhole (*Cuon alpinus*), leopard (*Panthera pardus*) and Himalayan black bear (*Ursus thibetanus*) use this corridor |
| **Habitat type** | Norhern tropical semi evergreen forests |
| **Major land use** | Agricultural land, Plantations, forests, settlements |
| **Elephant movement status** | Seasonal |
| **Number of elephants using the corridor** | 5 |
| **Linear infrastructure in the corridor** | National Highway |
| **Major bottleneck in the corridor** | Yajang B and Yajang C areas within the corridor |
| **Recommendations by the forest department to improve the corridor** | 1. Conservation of remnant habitat through the community conservation area (CCA)<br>2. Awareness and sensitization programs<br>3. Habitat improvement such as creation of salt licks. |
| **Current status of the corridor** | Active. Intensity of use by elephants decreased. |



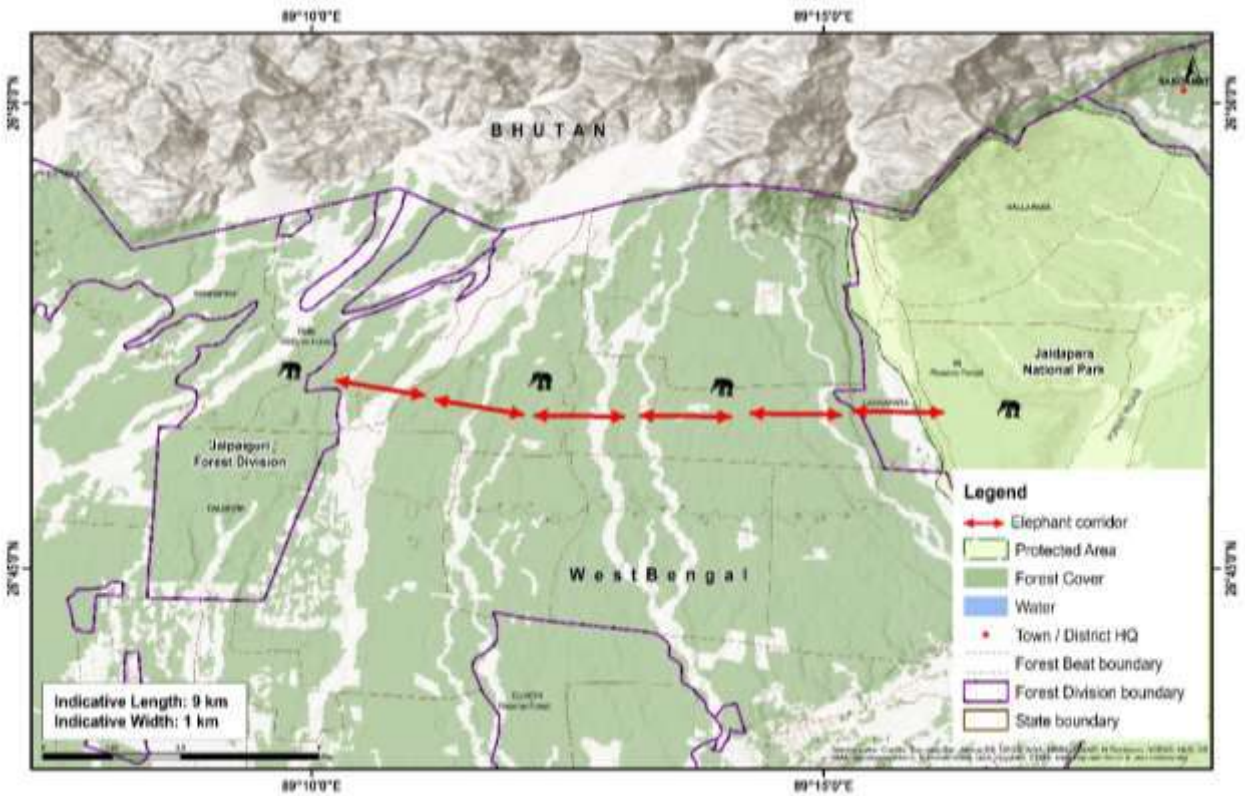
## 34. Titi- Dumchi - Reti

| | |
|---|---|
| **Connectivity** | **The corridor links Titi Reserve Forest in Lankapara and Madarihat Ranges of northern part of Jaldapara National Park (Wildlife Division III) with Rethi Reserve Forest in Dalgaon Range of Jalpaiguri Forest Division), passing through Dumchi Reserve Forest.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 14-16 km, width = 1.2 km |
| **Geo coordinates** | Titi to Dumchi = 26°44'54.492" N, 89°16'29.4744" E & 26°43'29.7732" N, 89°13'39.8388" E<br>Dumchi to Reti = 26°43'40.26" N, 89°11'32.8416" E & 26°44'40.4962" N, 89°9'8.2362" E |
| **Beats falling within corridor** | Titi 3A, Titi extension to DMC 1,2 compt. to Rethi forest of Jalpaiguri Forest Division |
| **Forest ranges falling within corridor** | Lankapara, Madarighat and Dalgaon ranges |
| **Revenue villages falling within corridor** | Five |
| **Administrative details of the corridor** | Titi 3A, Titi extension to DMC 1, 2 compt to Rethi forest of Jalpaiguri Division. |
| **Ecological importance** | This is the main corridor used by elephants to move from Alipurduar to Jalpaiguri maintaining to connectivity between the Protected Areas of Jaldapara and Gorumara National Parks through the Reserved Forests of Jalpaiguri Forest Division. |
| **Habitat type** | Tropical semi evergreen, Sal-dominated northern dry deciduous and riverine forest |
| **Major land use** | Forest = 1245 ha<br>Agriculture = 2455 ha<br>Habitation = 300 |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 65 - 75 |
| **Linear infrastructure in the corridor** | 1) I*ndian Oil filtration unit* and its settlements bounded by high walls.<br>2) High heavy vehicular traffic<br>3) Irrigation canal at Tulsipara tea garden<br>4) High power tension line (11000 v) |
| **Major bottleneck** | Jamtola Bazar to Hantupara tea garden |
| **Recommendations by the forest department to improve the corridor** | 1) 200 metre section of the southern part of the Hantapara Tea Garden Labour Line (Bigan Bari) towards Jamtola needs to be secured to increase the effective width of the corridor.<br>2) Vehicular speed should be controlled using suitable barriers on Lankapara Birpara state highway. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



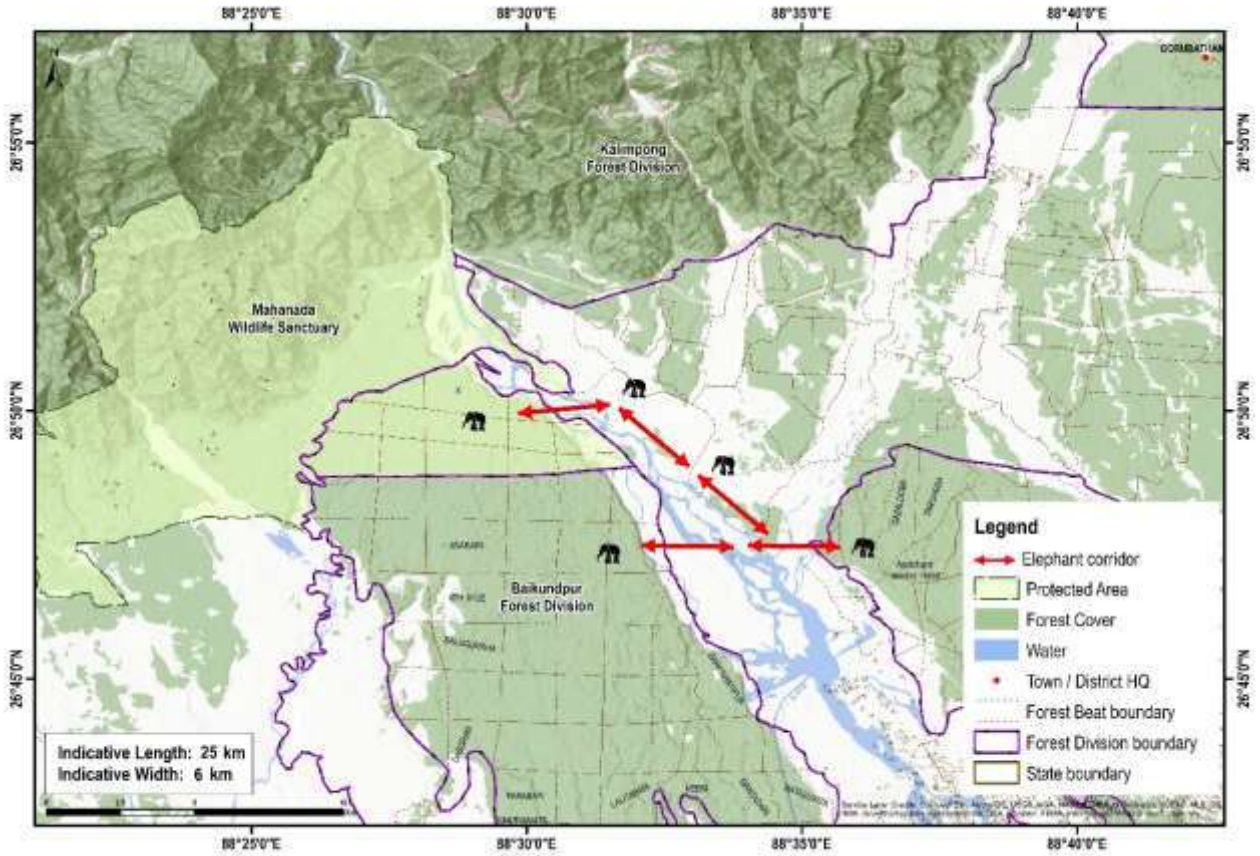
## 35. Titi- Reti

| | |
|---|---|
| **Connectivity** | **The corridor links Titi Reserve Forest in Lankapara Range and Madarihat Range of the northern part of Jaldapara National Park (Wildlife Division III) with Rethi Reserve Forest in Dalgaon Range of Jalpaiguri Forest Division passing through Dumchi Reserve Forest.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 8-9 km, width = 700 m – 1300 m |
| **Geo coordinates** | 26º 45' 59" N, 89º 10' 12" E<br>26º 47' 37" N, 89º 15' 49" E |
| **Compartments/beats falling within corridor** | Titi 3A, Titi extension to DMC 1, 2 compt to Rethi forest of Jalpaiguri Division. |
| **Forest ranges falling within corridor** | Lankapara, Madarighat and Dalgaon ranges |
| **Revenue villages falling within corridor** | Five |
| **Ecological importance** | This is one of the important corridors that elephants use to move from Jaldapara National Park to the forests of Jalpaiguri Forest Division. |
| **Habitat type** | Tropical semi-evergreen, Sal-dominated northern dry deciduous and riverine forest |
| **Major land use** | Forest = 0<br>Tea garden = 1200 ha<br>Habitation = 100 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 65 - 75 |
| **Linear infrastructure in the corridor** | 1) *Indian Oil filtration unit* and its settlements bounded by high walls.<br>2) High heavy vehicular traffic<br>3) Irrigation canal at Tulsipara TG<br>4) High power tension line (11000 v) |
| **Major bottleneck** | Labour lines of Lankapara and Garganda tea gardens |
| **Recommendations by the forest department to improve the corridor** | 1) 200 metre section of the southern part of the Hantapara Tea Garden Labour Line (Bigan Bari) towards Jamtola needs to be secured to increase the effective width of the corridor.<br>2) Vehicular speed should be controlled using suitable barriers on Lankapara Birpara state highway. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased |



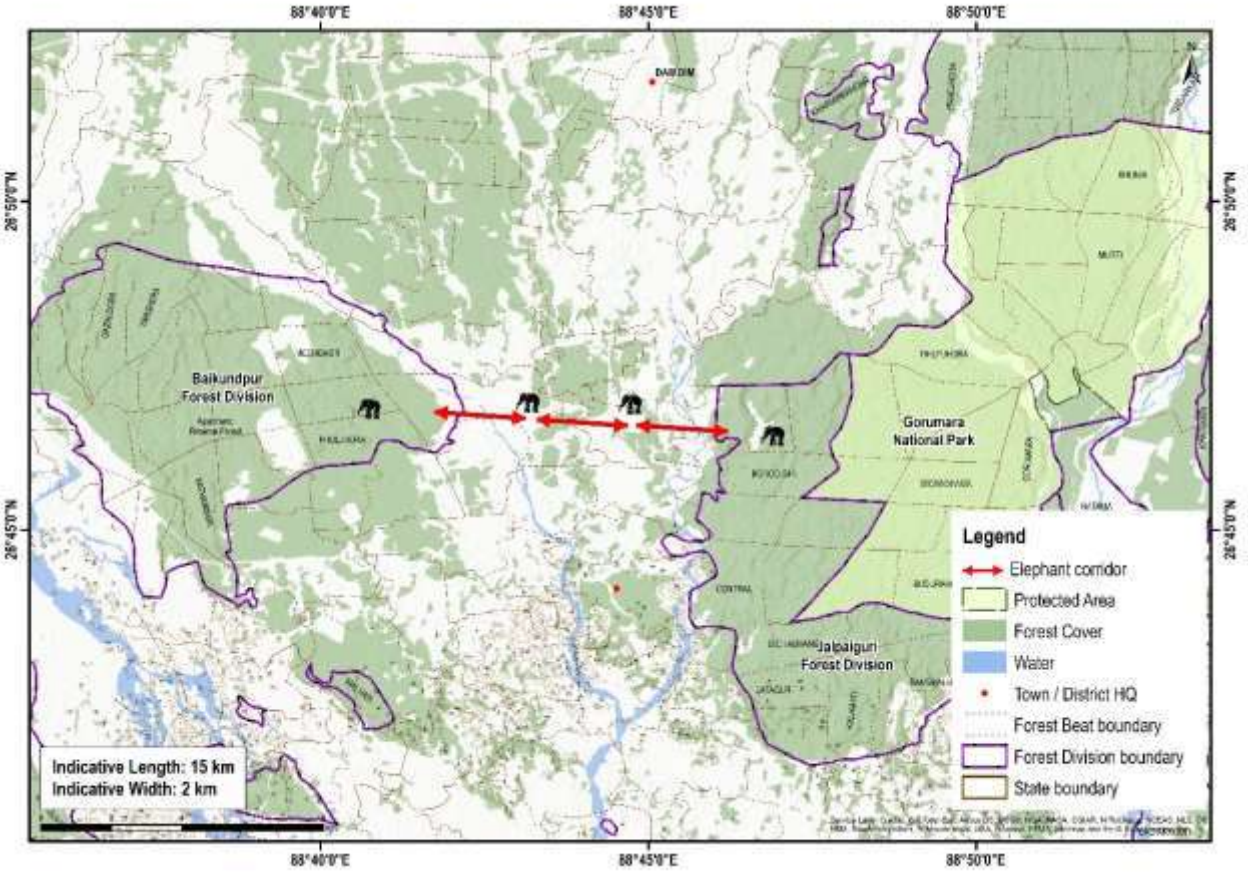
## 36. Apalchand- Mahananda

| | |
|---|---|
| **Connectivity** | **This corridor connects Apalchand Reserve Forest (Baikunthapur Forest Division) with Mahananda Wildlife Sanctuary.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 25 km, width = 6 km |
| **Geo coordinates** | 26°46'58" N / 088°28'10" E<br>26°52'22" N / 088°35'39" E |
| **Compartments falling within corridor** | Laltong compartment 3, 8 and 13 of South range |
| **Forest ranges falling within corridor** | Apalchand, Targhera, Sarugarh, Ranges and North, South and west ranges of Mahananda Wildlife Sanctuary |
| **Revenue villages falling within corridor** | 12 |
| **Ecological importance** | The riparian tract along river Teesta is an important dry season habitat for elephants. |
| **Habitat type** | Grassland |
| **Major land use** | Forest = 3500 ha<br>Agriculture = 2000 ha<br>Habitation = 2500 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) Teesta filed firing range<br>2) Bituminous road form Trghera checkpost to Apalchand checkpost (10 km) and Bagarmore to Gazoldoba Bazar road (10 km)<br>3) Teesta canal with concrete embankment<br>4) National Highway 10A (NH 31) |
| **Major bottleneck** | Saugoan, Kalagati, Washabari, Ellenbari, Totgoan, Sundari busty, Nipania, Saraswatipur village, Chumakdangi |
| **Recommendations by the forest department to improve the corridor** | 1) Teesta filed firing range should be immediately be shifted to some other area |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



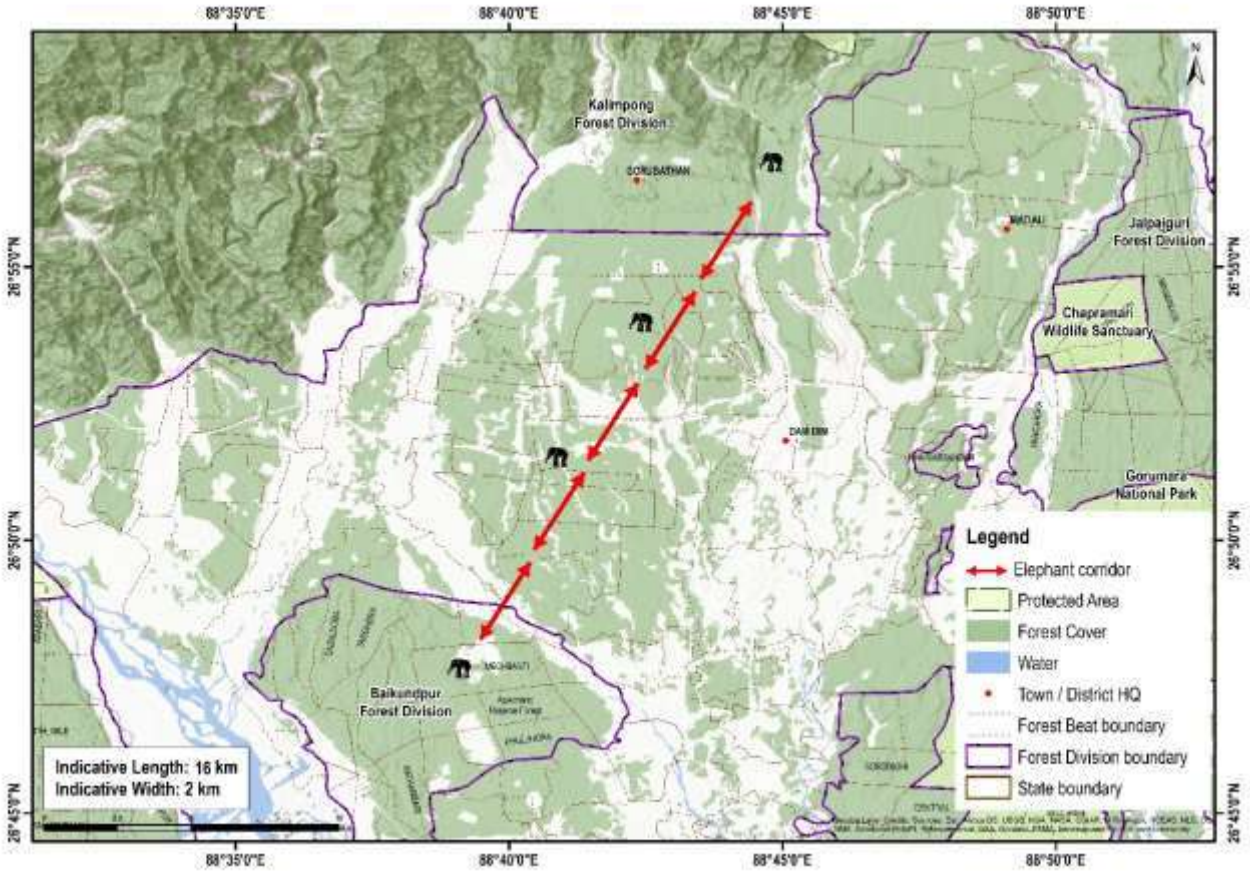
## 37. Apalchand- Gorumara

| | |
|---|---|
| **Connectivity** | **This corridor connects the elephant population of Gorumara National Park with Apalchand Reserve Forest.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 15 km, width = 2 km |
| **Geo coordinates** | 26°44'38" N / 088°40'30" E<br>26°48'14" N / 088°48'39" E |
| **Forest ranges falling within corridor** | Apalchand, Targhera and Lataguri Ranges |
| **Revenue villages falling within corridor** | Seven |
| **Habitat type** | River bed |
| **Major land use** | Forest = 3000<br>Agriculture = 500<br>Habitation = 700 |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) *National Highway 31* and associated vehicular traffic<br>2) A broad-gauge railway line connecting Mal Bazar to Jalpaiguri<br>3) Teesta canal with concrete embankment |
| **Major bottleneck** | Barodighi, Nepuchapur, Damdim, Bethguri, Kumlai, Kranti and Neora |
| **Recommendations by the forest department to improve the corridor** | 1) Shifting of human habitations from the area. |
| **Current status of the corridor** | Impaired |



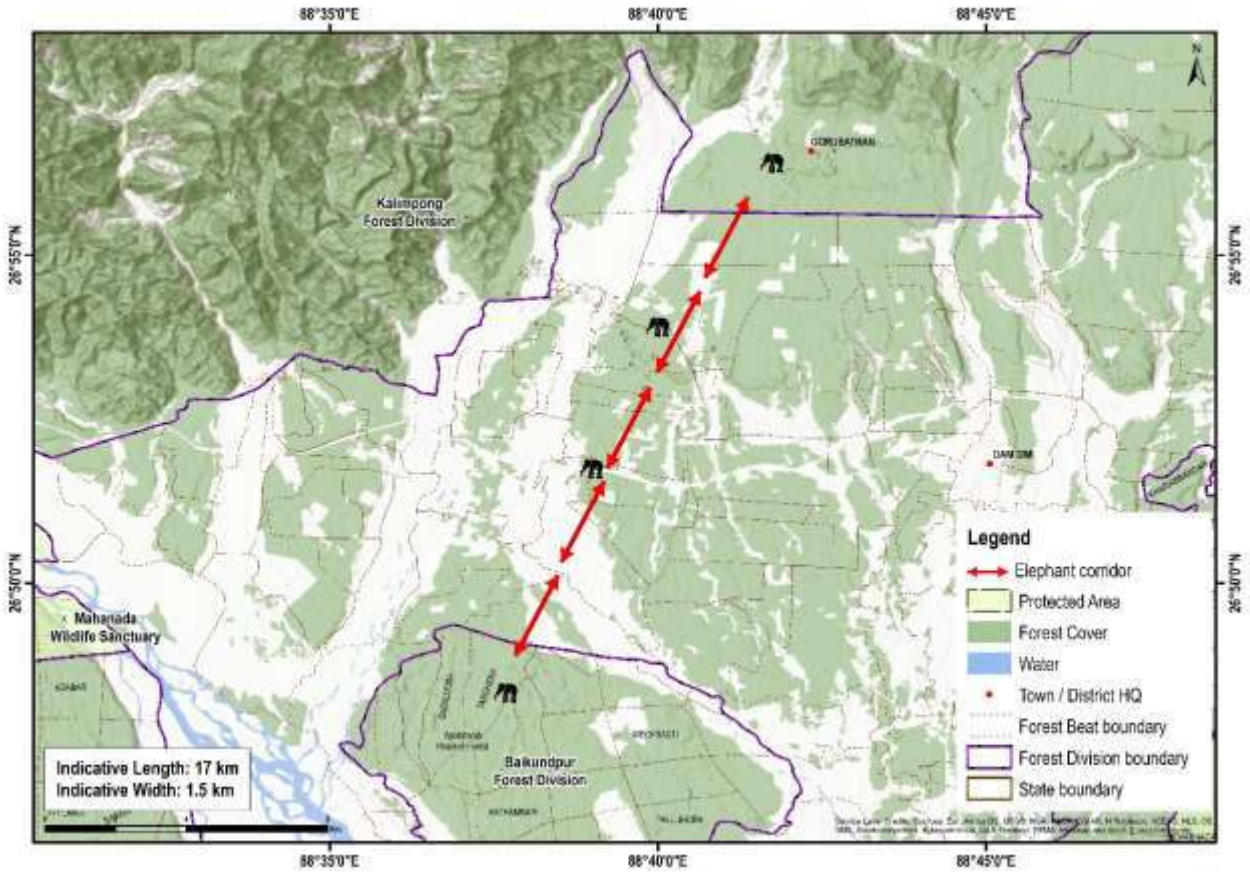
## 38. Apalchand- Klimpong at Mal block (via Meenglass)

| | |
|---|---|
| **Connectivity** | **This corridor facilitates elephant movement from Apalchand Reserve Forest in the Baikuntapur Forest Division to Mal Block in Bhuttabari Forest of Kalimpong Forest Division.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 16 km, width = 2 km |
| **Geo coordinates** | 26°48'14" N / 088° 39'07" E<br>26°55'37" N / 088°45'06" E |
| **Forest ranges falling within corridor** | Apalchand, Targhera and Gorubathan ranges |
| **Revenue villages falling within corridor** | Nine |
| **Habitat type** | Riparian |
| **Major land use** | Forest = 2800 ha<br>Agriculture = 100 ha<br>Habitation = 250 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) National Highway 31 and associated vehicular traffic<br>2) A broad-gauge railway line connecting Mal Bazar to Jalpaiguri<br>3) High tension power line (11000 v), 15 km |
| **Recommendations by the forest department to improve the corridor** | 1) Shifting of human habitations from the area. |
| **Current status of the corridor** | Impaired<br>Elephants diverted from their route and using a different nearby corridor. |



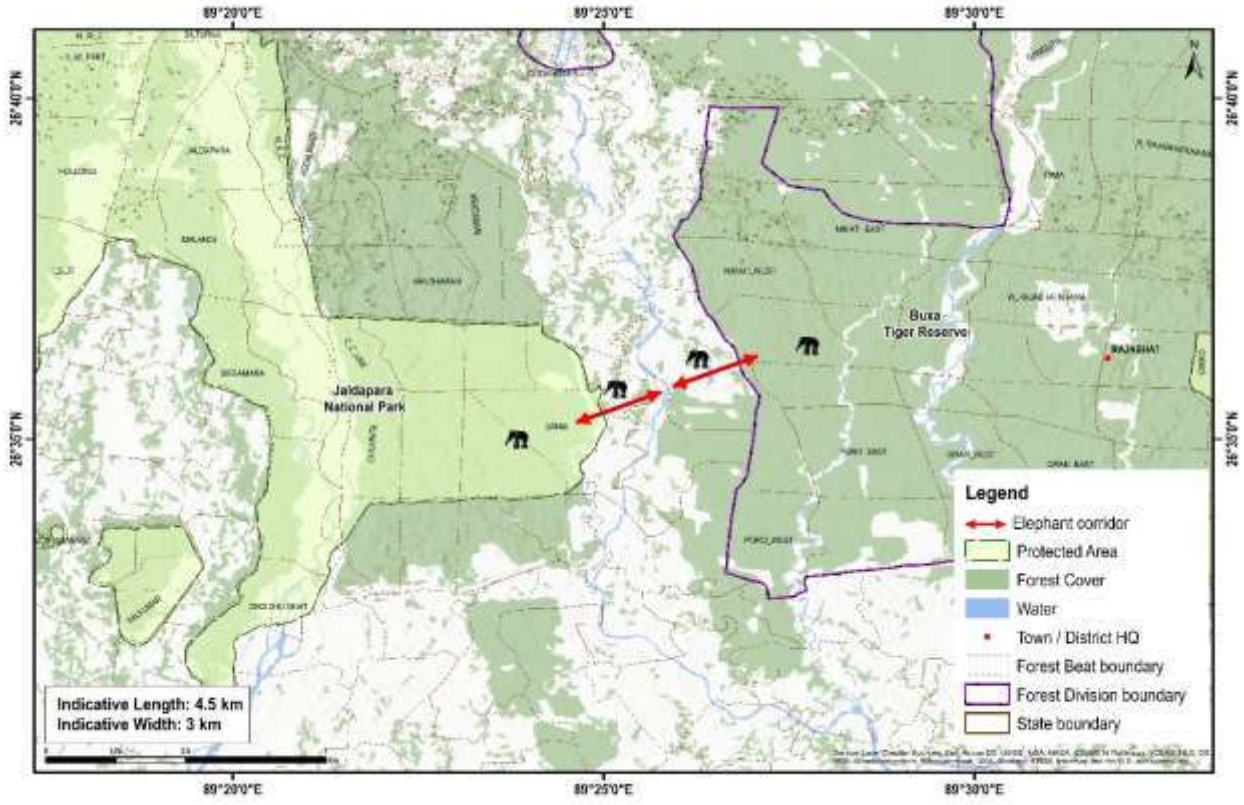
## 39. Apalchand- Klimpong at Mal block (via Sylee)

| | |
|---|---|
| **Connectivity** | **This corridor connects Apalchand Reserve Forest (Baikanthapur Forest Division) with Mal Block (Kalimpong Forest Division)** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 17 km, width = 1.5 km |
| **Geo coordinates** | 26° 48' 53" N / 088° 39' 40" E<br>26° 55' 36" N / 088° 42' 18" E |
| **Forest ranges falling within corridor** | Apalchand, Targhera and Gorubathan Ranges |
| **Revenue villages falling within corridor** | Nine |
| **Administrative details of the corridor** | Mal block |
| **Habitat type** | Riparian forests and grasslands |
| **Major land use** | Forest = 1800 ha<br>Agricultural land = 150 ha<br>Habitation = 280 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) *National Highway 31* and associated vehicular traffic<br>2) A broad-gauge railway line connecting Mal Bazar to Jalpaiguri<br>3) High tension power line (11000 v), 10 km |
| **Major bottleneck** | Damdim, Ranichera, Sylee, Chakla basti, Kumlai, Rungamatee, Dalim Kote, Gurjan Jhora, Bhutta Bari villages falling within the corridor |
| **Recommendations by the forest department to improve the corridor** | 1) Shifting of human habitations from the area and raising plantations in those areas. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



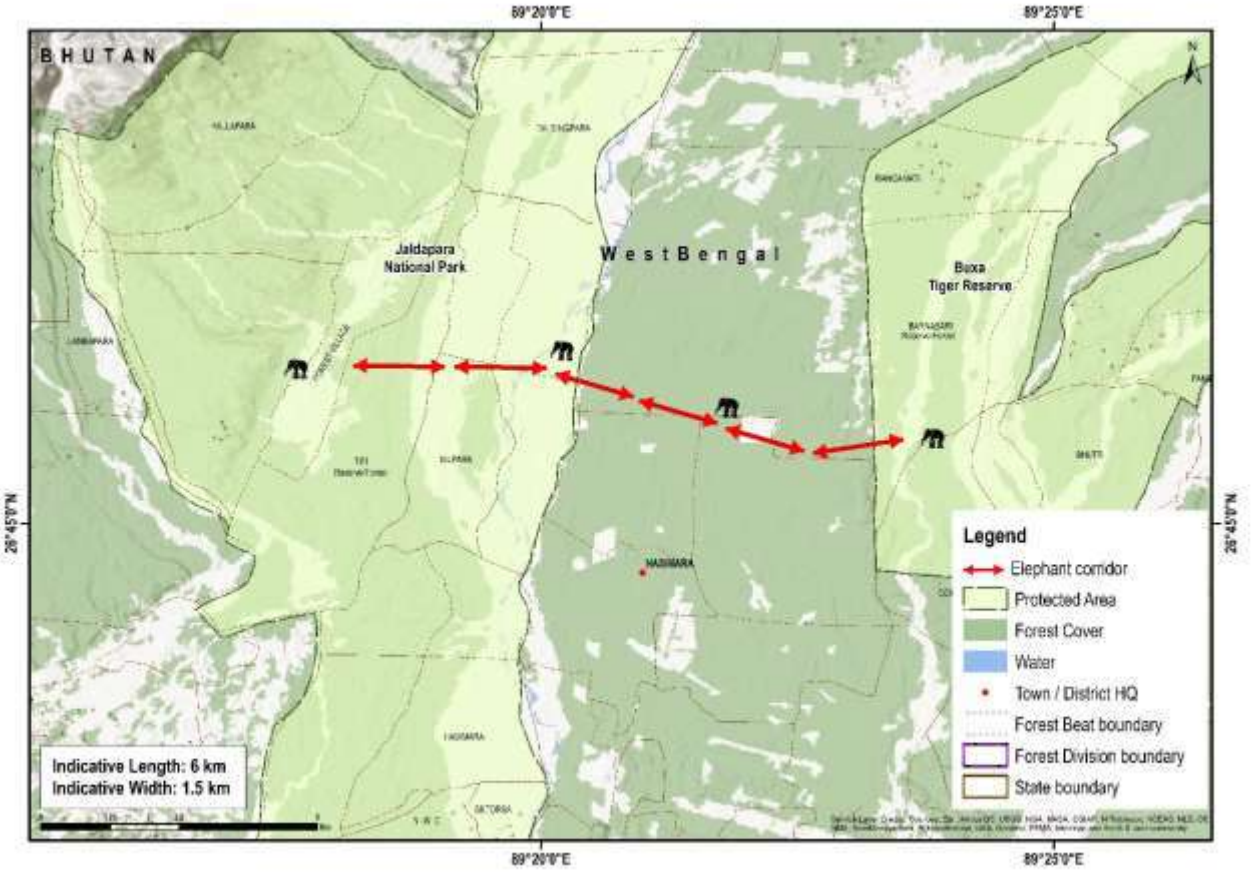
## 40. Nimati- Chilpata (Buxa- Chilpata)

| | |
|---|---|
| **Connectivity** | **This corridor facilitates elephant movement between the Nimati Range of Buxa Tiger Reserve and Chilapata Reserve Forest of Wildlife III Division, thereby maintaining elephant movement between Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 4.5 km, width = 3 km |
| **Geo coordinates** | 26° 34' 45" N, 89° 24'15" E<br>26° 36' 41" N, 89° 26'43" E |
| **Compartments falling within corridor** | Poro 5,6,11 |
| **Forest ranges falling within corridor** | Nimati range |
| **Revenue villages falling within corridor** | 5 |
| **Ecological importance** | This is one of the most important corridor used by elephants for moving between Jaldapara National Park and Buxa Tiger Reserve. |
| **Habitat type** | Sub-Himalayan secondary wet mixed forest, Eastern Bhabar and Terai Sal |
| **Major land use** | Forest = 650 ha<br>Agriculture = 500 ha<br>Habitation = 100 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Around 290 elephants occur in the landscape. Many of them use the corridor. |
| **Linear infrastructure in the corridor** | 1) National Highway 31 and associated vehicular traffic<br>2) PWD Roads including Nimati – Patkapara road and Mendabari road<br>3) 10 Km of High tension (11 KV) power line<br>4) Tea estate factories, hotels and *dhabas*<br>5) Ishtikutum Khamar Bari lodge |
| **Major bottleneck** | Bhutia Basti and Patkapra village |
| **Recommendations by the forest department to improve the corridor** | 1) Notification of the corridors and its legal protection<br>2) The southern part of Nimtijhora Tea Garden line should be secured to increase the effective width<br>3) Ishtikutum Khamar Bari lodge should be relocated |
| **Corridor status of the corridor** | Active. Intensity of use by elephants increased. |



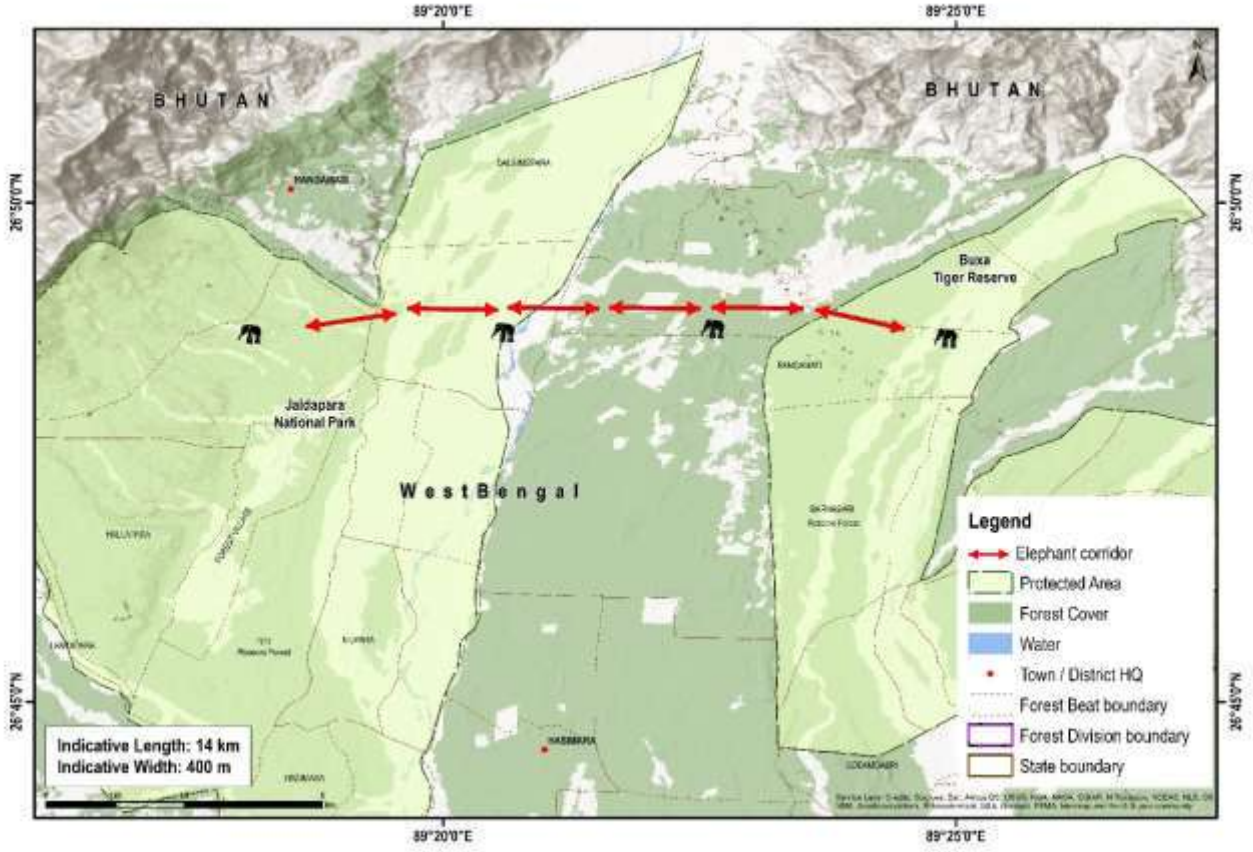
## 41. Buxa- Titi (via Beech and Bharnobari Tea Garden)

| | |
|---|---|
| **Connectivity** | **This corridor connects Buxa Tiger Reserve and Titi Reserve Forest (Wildlife III Division), thereby connecting the elephant population between Buxa Tiger Reserve and Jaldapara National Park.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 6 km, width = 1.5 km |
| **Geo coordinates** | 26° 44' 22" N, 89° 18' 24" E<br>26° 47' 19" N, 89° 23' 26" E |
| **Compartments falling within corridor** | BNB 1 of the Bharnabari beat |
| **Forest ranges falling within corridor** | Hamiltonganj and Nilpara range |
| **Revenue villages falling within corridor** | 3 |
| **Ecological importance** | One of the most important corridors intensively used by the elephants. |
| **Habitat type** | Sub-Himalayan secondary wet mixed forest, Eastern Bhabar and Terai Sal |
| **Major land use** | Forest = 150 ha<br>Agriculture = 350 ha<br>Habitation = 100 |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Around 290 elephants occur in the landscape. Many of them use the corridor. |
| **Linear infrastructure in the corridor** | 1) State Highway 12 A and associated vehicular traffic<br>*2)* Old railway line trench<br>3) Factories of Bharnabari and Beech Tea Graden |
| **Major bottleneck** | Topline of Beech Tea Garden |
| **Recommendations by the forest department to improve the corridor** | 1) Notification of the corridors and its legal protection<br>2) Expansion of tea gardens and settlements should be regulated.<br>3) Trenches meant for waste water drainage in tea gardens should be leveled. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



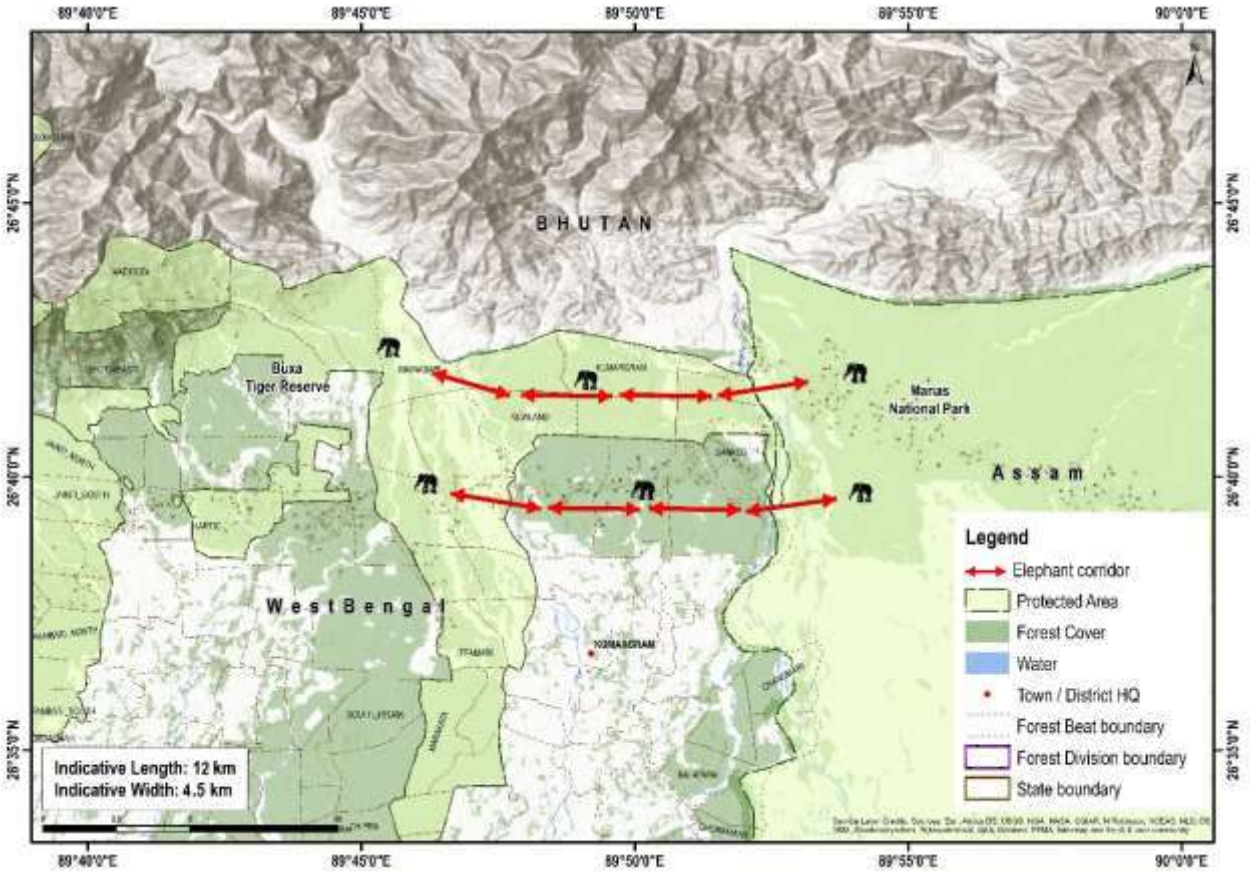
## 42. Buxa- Titi (via Torsha)

| | |
|---|---|
| **Connectivity** | **This corridor connects Buxa Tiger Reserve and Titi Reserve Forest (Wildlife III Division), thereby connecting the elephant population between Buxa Tiger Reserve and Jaldapara National Park in Alipurduar District.** |
| **State** | West Bengal |
| **Indicative length and width** | Length 14 km, width = 400 m |
| **Geo coordinates** | 26° 48' 11" N, 89° 18' 43" E<br>26° 49' 34" N, 89° 24' 45" E |
| **Compartments falling within corridor** | Rangamati block of Hamiltonganj range of Buxa Tiger Reserve and Titi Forest of Lankapara Range of Jaldapara Wildlife Division |
| **Forest ranges falling within corridor** | Hamiltonganj and Lankapara range |
| **Revenue villages falling within corridor** | Four |
| **Ecological importance** | Important elephant corridor between Buxa Tiger Reserve and Titi Reserved Forests that is widely used by elephants. |
| **Habitat type** | Tropical semi evergreen forest, northern Sal-dominated dry deciduous forest, Eastern sub-montane semi-evergreen forest, Riparian Forest and Forest plantations |
| **Major land use** | Forest = 160 ha<br>Agriculture = 300 ha<br>Habitation = 100 |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Around 290 elephants occur in the landscape. Many of them use the corridor. |
| **Linear infrastructure in the corridor** | 1) State Highway 12 A and associated vehicular traffic<br>2) High vehicular traffic on hasimara- Pasakha road<br>3) Old railway line trench<br>4) Factories of Torsa Tea Garden |
| **Recommendations by the forest department to improve the corridor** | 1)Notification of the corridors and its legal protection<br>2) Expansion of tea gardens and settlements should be regulated.<br>3) Trenches meant for waste water drainage in tea gardens should be leveled |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



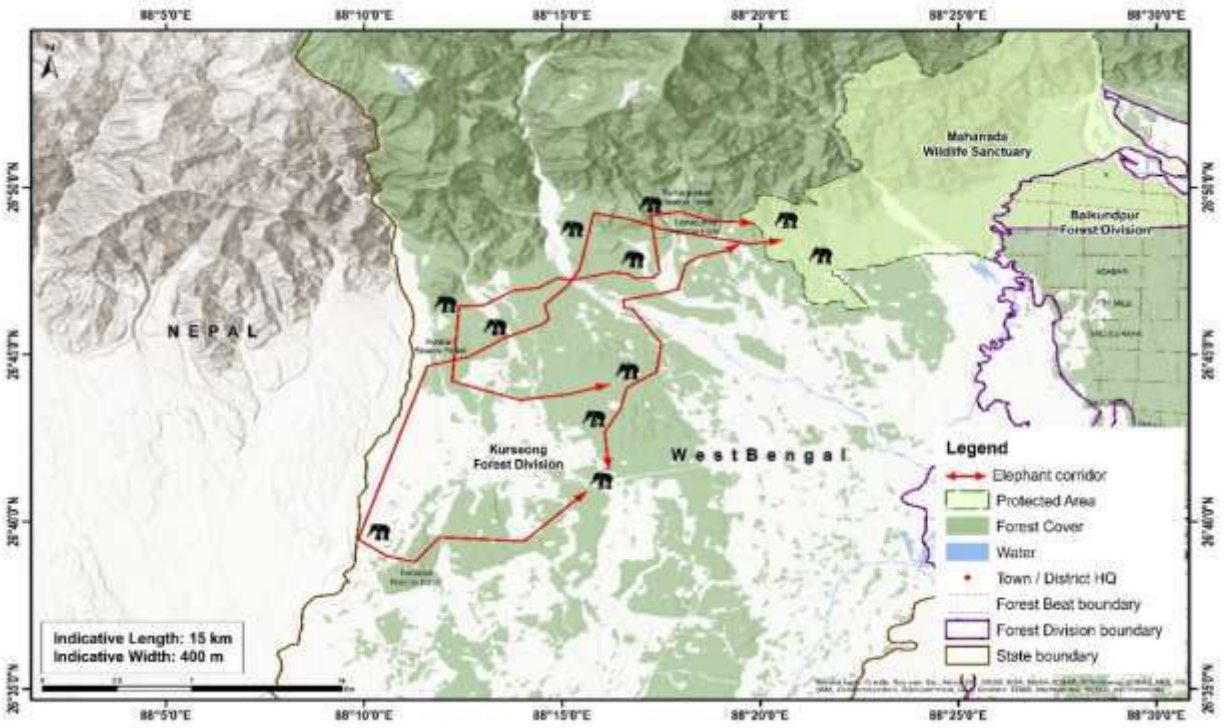
## 43. Buxa- Ripu at Sankosh

| | |
|---|---|
| **Connectivity** | **This corridor connects Buxa Tiger Reserve (West Bengal) with the Ripu forest in Kochugaon Forest Division (Assam).** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 12 km, width = 4.5 km |
| **Geo coordinates** | 26° 38' 58" N, 89° 46' 47" E<br>26° 42' 40" N, 89° 53' 55" E |
| **Compartments falling within corridor** | Newland- 1, 2A, 2B, Kumargram- 1, 2, Sankosh- 1a, 1b, 2, 3a, 3b |
| **Forest ranges falling within corridor** | Kumargram range |
| **Revenue villages falling within corridor** | 3 |
| **Ecological importance** | It provides linkage between Buxa Tiger Reserve in West Bengal to Raimona National Park and Manas Tiger Reserve in Assam. It acts as satellite habitat for spill over population. |
| **Habitat type** | Tropical semi evergreen and tropical deciduous forest |
| **Major land use** | Forest = 3099 ha<br>Agriculture = 141 ha<br>Habitation = 54 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | 215 (approximately) |
| **Linear infrastructure in the corridor** | 1) Electric fence – 1 km<br>2) 400 kv DC power line- 3.5 km<br>3) Borobisha- Sankosh- Bhutan state highway, 3 km |
| **Major bottleneck** | Kumargram and Sankosh forest villages falling right in the corridor. |
| **Recommendations by the forest department to improve the corridor** | 1)Notification of the corridors and its legal protection<br>2) Relocation of forest villages |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



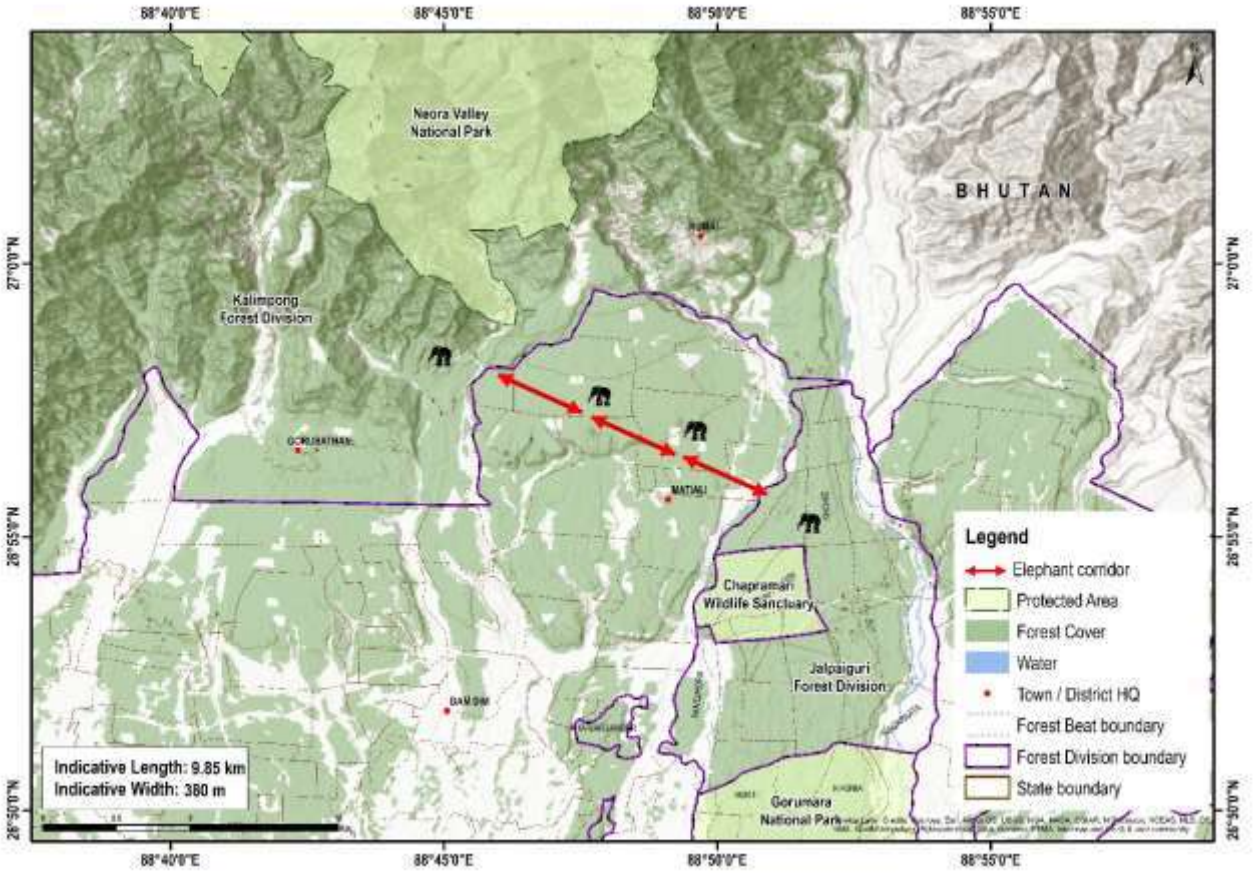
## 44. Mahananda- Kolabari- Tukriajhar

| | |
|---|---|
| **Connectivity** | **This corridor connects the Sukna and West range under Mahananda Wildlife Sanctuary with Bamonpokhri, Panighatta, Bagdogra Range and Tukriajhar Ranges of Kurseong Forest Division.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 15 km, width = 400 m |
| **Geo coordinates** | 26°48'25.4" N, 88°20'34.0" E to 26°40'54.6" N, 88°15'37.2" E<br>26°48'56" N, 88°19'50.8" E to 26°44'06.3" N, 88°16'11.9" E<br>26°41'33.7" N, 88°16'10.3" E to 26°48'18.5" N, 88°19'28.4" E |
| **Beats falling within corridor** | Sukna, Lamgumpha, Rakti, Balasan, Tatari, Panighatta, and Marapur |
| **Forest ranges falling within corridor** | Sukna Range, West Range, Bamonpokhri Range ,Panighatta Range, Bagdogra Range and Tukriajhar Range |
| **Revenue villages falling within corridor** | 50- 60 |
| **Ecological importance** | The corridor provides movement to elephant from Baikunthapur Forest Division to Mahananda WLS and Kurseong Division. |
| **Habitat type** | Moist mixed forests, teak (*Tectona grandis*) plantations |
| **Major land use** | Forest = 500 ha<br>Agriculture = 2500 ha<br>Habitation = 200 ha |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) In Bamanpokhri Range: Kurseong Connecting road Via Rohini and Khaprail, MatigaraPankhabari Road<br>2) In Bagdogra Range: Asian Highway and Broad Guage Train. Bengdubi Panighatta Road.<br>3) Vehicular traffic on Asian Highway<br>4) About 2 -3 km long boulder sausage and concrete embankment along Mechi River.<br>5) High tension power line |
| **Major bottleneck** | Sukna and Bengdubi cantonment. Railway lines and presence of HT lines. |
| **Recommendations by the forest department to improve the corridor** | 1) No further extension of human settlement to be allowed by district administration in areas falling within elephant corridors.<br>2) Innovative conflict mitigation strategies.<br>3) Regular Checking of illegal hooking, sagging power lines along the corridor by electricity department |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



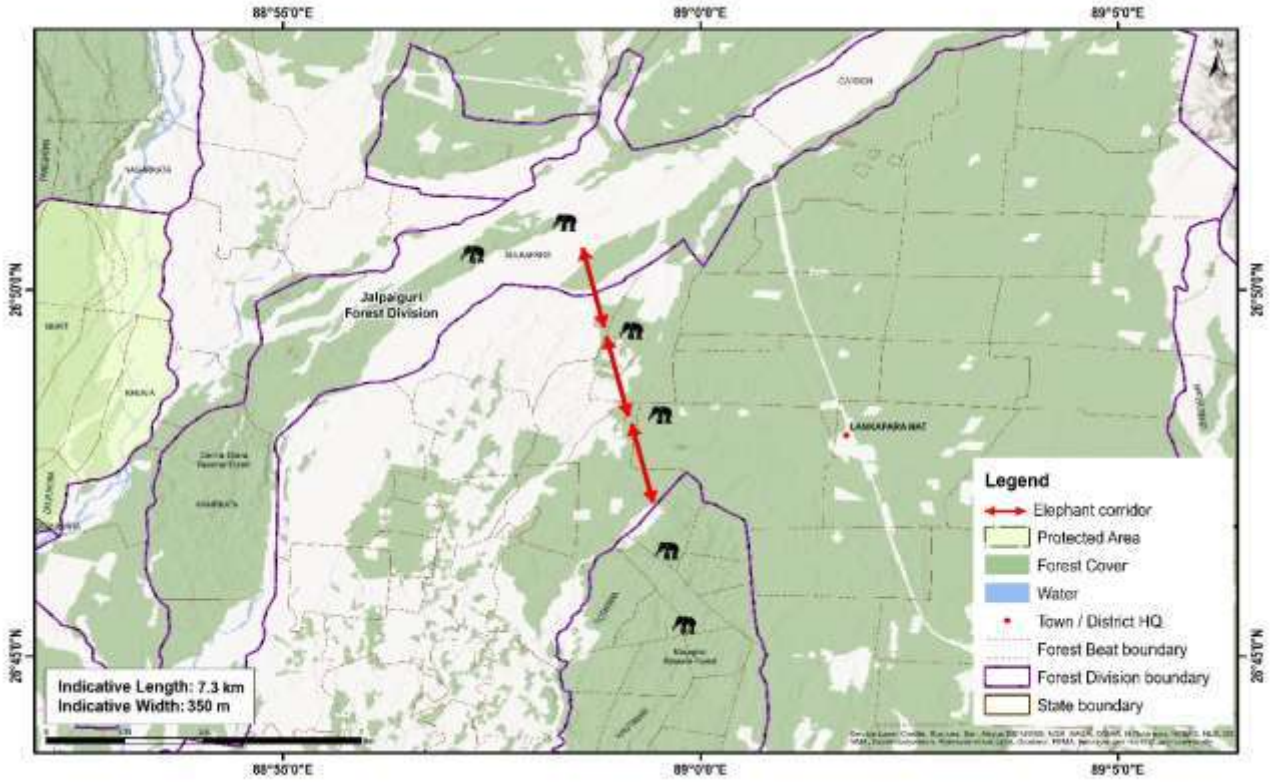
## 45. Chapramari - Kalimpong

| | |
|---|---|
| **Connectivity** | **This corridor connects the Chapramari Wildlife Sanctuary (Jalpaiguri District) to Kalimpong Division – Bhuttabari Forest (Kalimpong District)** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 9.8 km, width = 380 m |
| **Geo coordinates** | 26°56'30.92" N, 88°51'10.79" E<br>26°57'41.49" N, 88°45'27.59"E |
| **Forest ranges falling within corridor** | Gorumara North, Chalsa, Neora South, Gorubathan and Jaldhaka Ranges |
| **Revenue villages falling within corridor** | 10 |
| **Ecological importance** | This corridor facilitates elephant movement between the Mal Block of Kalimpong Forest Division and Chapramari Wildlife Sanctuary of Gorumara Wildlife Division. |
| **Habitat type** | Tropical moist deciduous forest, Riparian Forest |
| **Major land use** | Tea plantations and settlements |
| **Elephant movement status** | Regular, the usage has increased |
| **Number of elephants using this corridor** | 80- 90 |
| **Major Bottleneck** | Tea Garden and Labour Lines |
| **Linear infrastructure in the corridor** | 1) Chalsa-Matiali road, Gorubathan road<br>2) T.G Irrigation canals<br>3) High-tension power line (11000 V)<br>4) Razor blade fencing<br>6) Tea garden factories |
| **Recommendations by the forest department to improve the corridor** | 1) No new construction should be permitted inside the corridor areas.<br>2) Limit expansion of Labour lines of Kilcot TG, Indong TG and Aibheel TG<br>3) Habitat should be restored in Gorubathan Reserve Forest.<br>4) Planned expansion of semi – urban agglomerations and convergence modules to be taken up by District Administration (District Planning Officer) with that of the Forest Dept. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



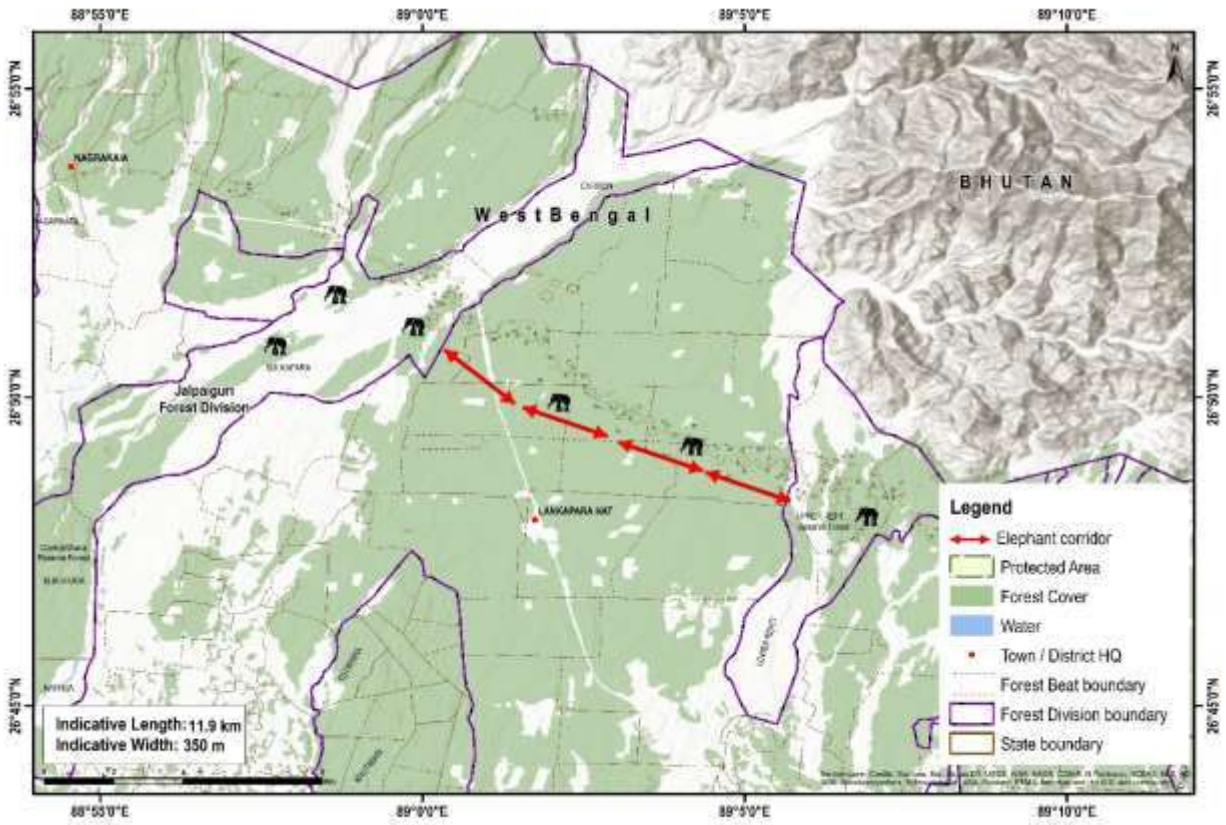
## 46. Moraghat–Central Daina

| | |
|---|---|
| **Connectivity** | **The corridor connects Moraghat Reserve Forest with Diana Reserve Forest of Jalpaiguri Forest Division, leading on to Gorumara National Park.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 7.3 km, width = 350 m |
| **Geo coordinates** | 26°47'12.22"N, 88°59'57.88"E<br>26°50'14.32"N, 88°58'57.83"E |
| **Forest ranges falling within corridor** | Banarkat Range |
| **Revenue villages falling within corridor** | 4 |
| **Ecological importance** | There is a good population of Elephants in Moraghat Reserve Forest which forms an important forest patch connecting forest of Central Daina. |
| **Habitat type** | Plantations |
| **Major land use** | Tea garden |
| **Elephant movement status** | Regular, the usage has increased |
| **Number of elephants using this corridor** | 75 |
| **Bottleneck** | Tea garden labour lines |
| **Linear infrastructure in the corridor** | 1) Banarhat - Totapara Road<br>2) Khairkata - Prayagpur road<br>3) Banarhat - Hridaypur road<br>4) Tea garden Irrigation canals<br>5) Tea garden Factory |
| **Recommendations by the forest department to improve the corridor** | 1) Overpass and underpass construction in selected areas of elephant passage.<br>2) Insulation and periodical maintenance of aerial HT and LT power lines.<br>3) Preserve continuity of corridors by preventing rampant building of infrastructures and inculcating the planning of civil administration with that of the Forest Dept.<br>4) Planned expansion of semi – urban agglomerations and convergence modules to be taken up by District Administration (District Planning Officer) with that of the Forest Deptt.<br>5) Change in cropping pattern and crop variations at specific areas.<br>6) Securing elephant corridors by creating dedicated route through Intra T.G jurisdictions. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



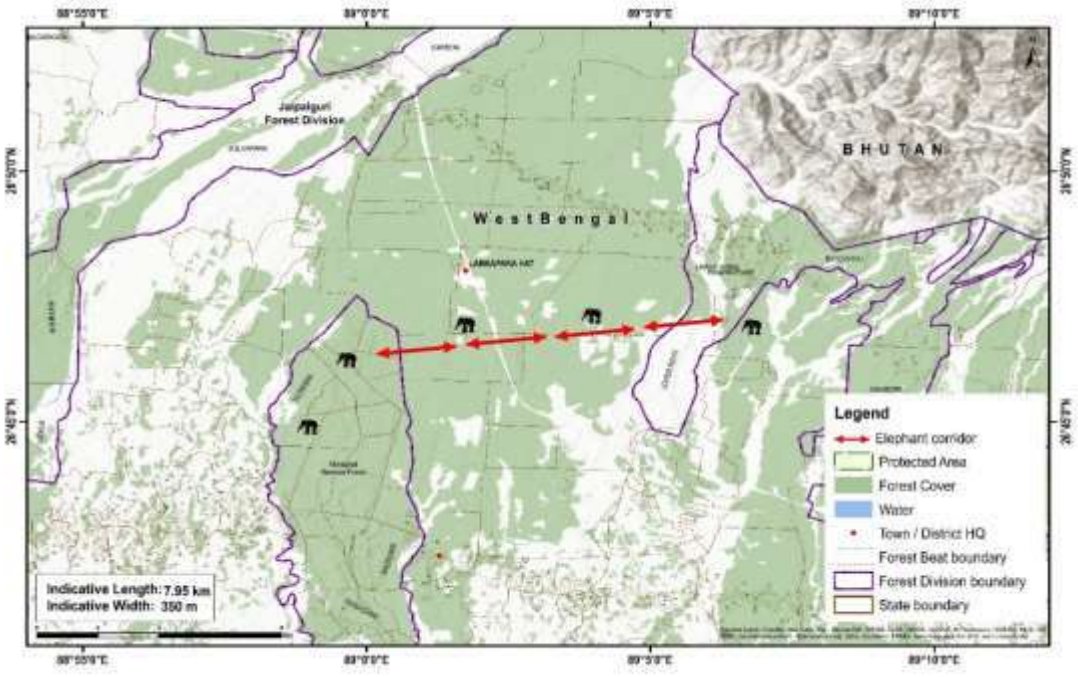
## 47. Reti–Central Daina

| | |
|---|---|
| **Connectivity** | **The corridor connects Reti Reserve Forest with Diana Reserve Forest of Jalpaiguri Forest Division, leading on to Gorumara National Park.** |
| **State** | West Bengal |
| **Indicative length and width** | Length = 11.9 km, width = 350 m |
| **Geo coordinates** | 26°48'20.84" N, 89° 5'22.11" E<br>26°52'3.68" N, 89° 1'27.06" E |
| **Forest ranges falling within corridor** | Banarhat Range |
| **Revenue villages falling within corridor** | 5 |
| **Habitat type** | Tea garden |
| **Major land use** | Tea garden |
| **Elephant movement status** | Regular, Increased use |
| **Number of elephants using this corridor** | 80-90 |
| **Bottleneck** | Tea garden labour lines |
| **Linear infrastructure in the corridor** | 1) National Highway- 31C<br>2) Banarhat - Chamurchi Road<br>3) Alipurduar to Siliguri Double track railway line, electrified, 1 km<br>4) T.G Irrigation canals.<br>5) High-tension power line (11000V)<br>6) Tea Garden Factory |
| **Recommendations by the forest department to improve the corridor** | 1) Insulation and periodical maintenance of aerial HT and LT power lines.<br>2) Preserve continuity of corridors by preventing rampant building of infrastructures and inculcating the planning of civil administration with that of the Forest Dept.<br>3) Planned expansion of semi – urban agglomerations and convergence modules to be taken up by District Administration (District Planning Officer) with that of the Forest Dept.<br>4) Securing elephant corridors by creating dedicated route through Intra tea garden jurisdictions. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



## 48. Moraghat- Reti

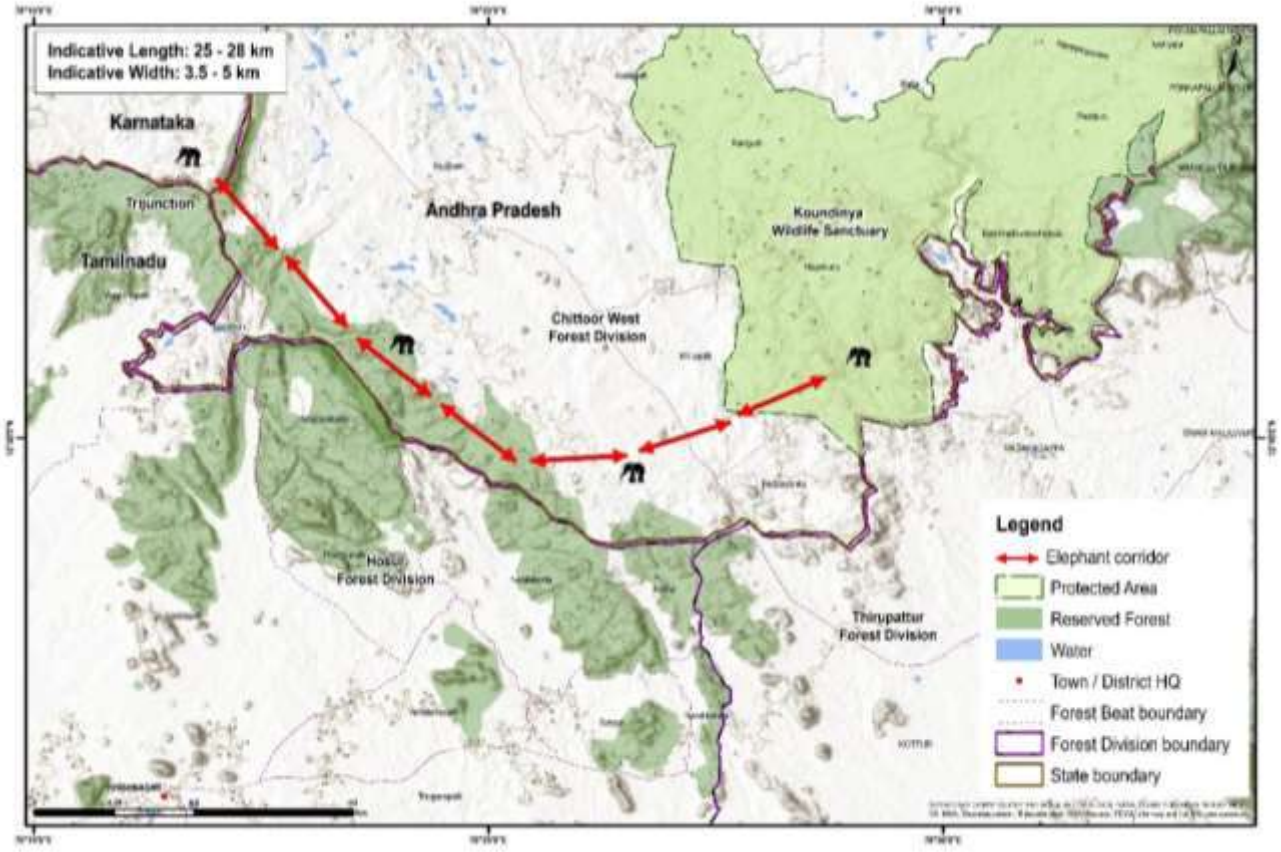
| Connectivity | This corridor connects Moraghat Reserve Forest with Reti Reserve Forest (Jalpaiguri Forest Division) |
|---|---|
| **State** | West Bengal |
| **Indicative length and width** | Length = 7.9 km, width = 350 m |
| **Geo coordinates** | 26°47'12.22"N, 88°59'57.88"E<br>26°50'14.32"N, 88°58'57.83"E |
| **Forest ranges falling within corridor** | Banarhat Range |
| **Revenue villages falling within corridor** | NA |
| **Ecological importance** | The area consists of more than 80 - 90 elephants which keep travelling between these forest patches. |
| **Habitat type** | Tea Garden |
| **Major land use** | Tea Garden and Army Cantonment |
| **Elephant movement status** | Regular, increased |
| **Number of elephants using this corridor** | 80- 90 |
| **Bottleneck** | 1) Siliguri – Alipurduar Railway line<br>2) National Highway 31 and associated heavy vehicular traffic |
| **Linear infrastructure in the corridor** | 1) National Highway 31C.<br>2) DBITA Road.<br>3) Banarhat – Chamurchi – Samtsa Road<br>4) One km of Alipurduar to Siliguri electrified double track railway line<br>5) One km of Irrigation canal<br>6) One km of High-tension power line (11000 V)<br>7) Tea garden factories |
| **Recommendations by the forest department to improve the corridor** | 1) Overpass and underpass construction in selected areas of elephant passage.<br>2) Insulation and periodical maintenance of aerial HT and LT power lines.<br>3) Monitoring of rail movement and speed limit fixed for the stretch through thermal sensor.<br>4) Preserve continuity of corridors by preventing rampant building of infrastructures and inculcating the planning of civil administration with that of the Forest Dept.<br>5) Planned expansion of semi–urban agglomerations and convergence modules to be taken up by District Administration (District Planning Officer) in coordination with Forest Dept.<br>6) Securing elephant corridors by creating dedicated route through Intra tea garden jurisdictions. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



# *Elephant Corridors*
# Southern Region

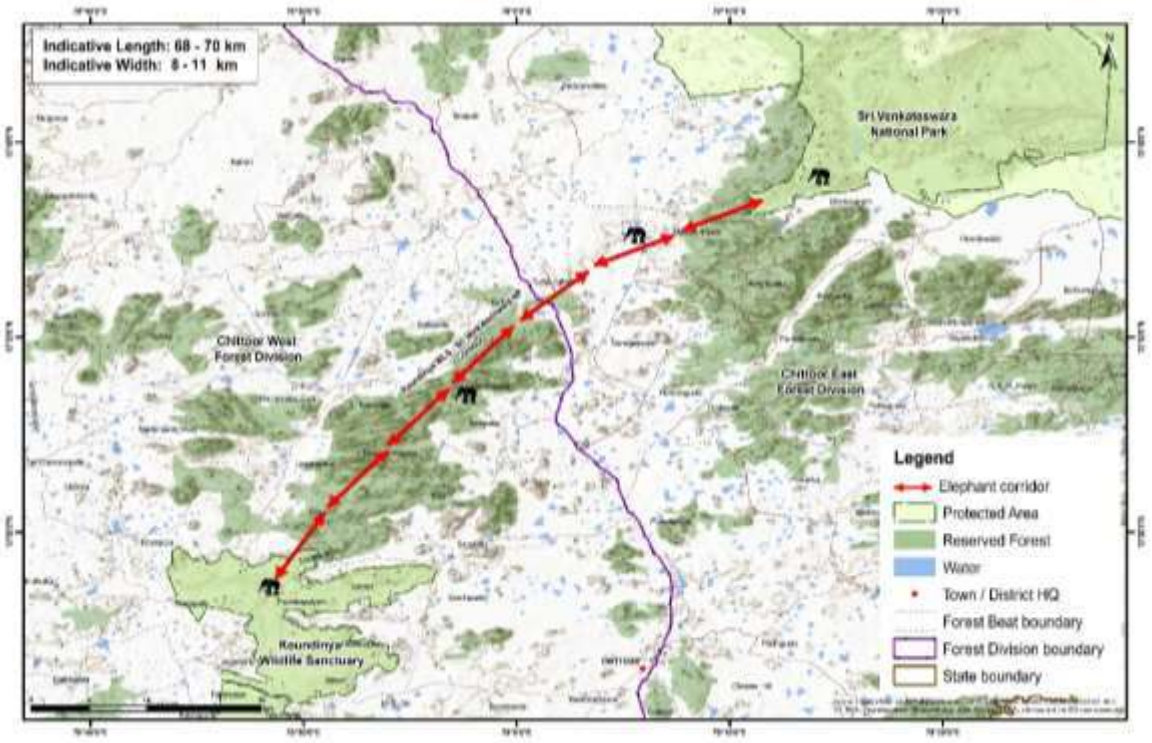
## 1. Tri-Junction Corridor

| | |
|---|---|
| **Connectivity** | **This corridor is used by elephants moving from (i) Kamasamudram SF of Bangarapet Range in Kolar Forest Division, Karnataka, (ii) Veppanapalli RF of Hosur Forest Division in Tamil Nadu, (iii) Nedumuru RF of Kuppam Range in Chittoor West Forest Division into Koundinya Wildlife Sanctuary through the village of Mallanoor.** |
| **State** | Andhra Pradesh |
| **Indicative length and width** | Length = 28 km, width = 3.5 - 5 km |
| **Geo coordinates** | 12.661704 / 78.383441 |
| **Compartments falling within corridor** | Compartment No- 328 to 334, 381, and 382 |
| **Forest ranges falling within corridor** | Kuppam Range of Chittoor West Forest Division |
| **Revenue villages falling within corridor** | 40 |
| **Ecological Importance** | This is the only corridor used by elephants dispersing from Karnataka and Tamil Nadu into southern Andhra Pradesh. In the absence of this corridor, the elephants of southern Andhra Pradesh would occur as a small and isolated population. The number of elephants in the area has also increased in the recent years |
| **Habitat type** | Dry deciduous forest, scrub forest with boulder hills and revenue lands |
| **Major land use** | Agricultural land along with human habitation |
| **Elephant movement status** | Seasonal, with movement of few loner males throughout the year |
| **Number of elephants using the corridor** | 15 - 20 |
| **Linear infrastructure in the corridor** | 1) Krishnagiri- Palamaner National Highway (NH42)<br>2) Bengaluru – Chennai Railway Line (approx. 25 km) passes through the corridor. Within Kothur RF of Tamil Nadu, there are two Railway lines<br>3) Other major district roads pass through the corridor |
| **Bottlenecks in the corridor** | Bangalore – Chennai Railway lines |
| **Recommendations by the forest department to improve the corridor** | Long term monitoring of the elephant movement required. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased |



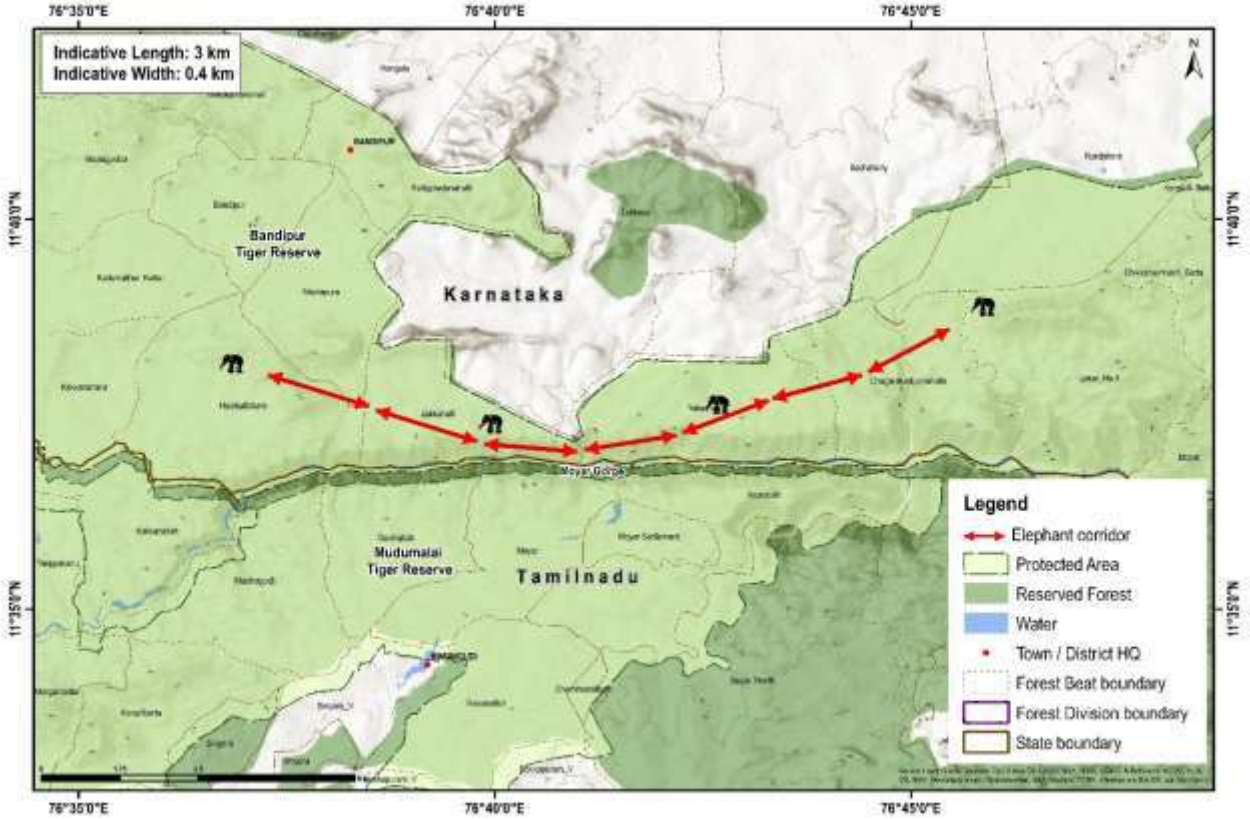
## 2. Rayala Elephant Reserve Corridor

| Corridor name | Rayala Elephant Reserve Corridor |
|---|---|
| State | Andhra Pradesh |
| Connectivity | Koundinya Wildlife Sanctuary to Sri Venkateswara National Park |
| Indicative length and width | Length = 70 km, Width = 11 km |
| Geo coordinates | 13.491271 / 79.006550 |
| Compartments falling within corridor | Compartment No- 78-83, 103- 108, 117, 118, 121- 131, 139- 195, 305- 323, 384, 1000 |
| Forest ranges falling within corridor | Punganur and Chittoor west ranges of Chittoor west Forest Division and Bakarapet Range of Chittoor east Forest Division |
| Revenue villages falling within corridor | 20 |
| Administrative details of the corridor | This area is extended Reserve forest of Koundinya Wildlife Sanctuary and a part of the elephant range |
| Ecological importance | This is the only corridor that elephants occurring in Sri Venkateswara National Park have used to move from Koundinya Wildlife Sanctuary. The corridor is also used by wildlife including leopard (*Panthera pardus*), slender loris (*Loris lydekkerianus*), four-horned antelope (*Tetracerus quadricornis*), dhole (*Cuon alpinus*), sloth bear (*Melursus ursinus*), sambar (*Rusa unicolor*), and others. The number of elephants in the area has also increased in the recent years. |
| Habitat type | Dry deciduous, scrub forest with boulder hills and revenue lands |
| Major land use | Forest area, with presence of few villages, agricultural land and mango orchards |
| Elephant movement status | Regular |
| Number of elephants using the corridor | 50 - 60 |
| Linear infrastructure in the corridor | 1) Bangalore- Tirupati Highway (NH4)- have heavy vehicular movement with reported animal hits<br>2) Kadapa- Chitoor Highway (NH40)<br>3) Proposed Bangalore- Chennai Expressway<br>4) High tension power line (approx. 50 km) passes through the corridor |
| Bottlenecks in the corridor | Elephant movement status between Pudiputlabylu and Mangalampettai beats of Chitoor East Forest Division remains unclear. |
| Recommendations by the forest department to improve the corridor | Long term monitoring of the elephant movement required. |
| Current status of the corridor | Active. Intensity of use by elephants increased.<br>However, elephant movement status between Pudiputlabylu and Mangalampettai beats of Chitoor East Forest Division remains unclear. |



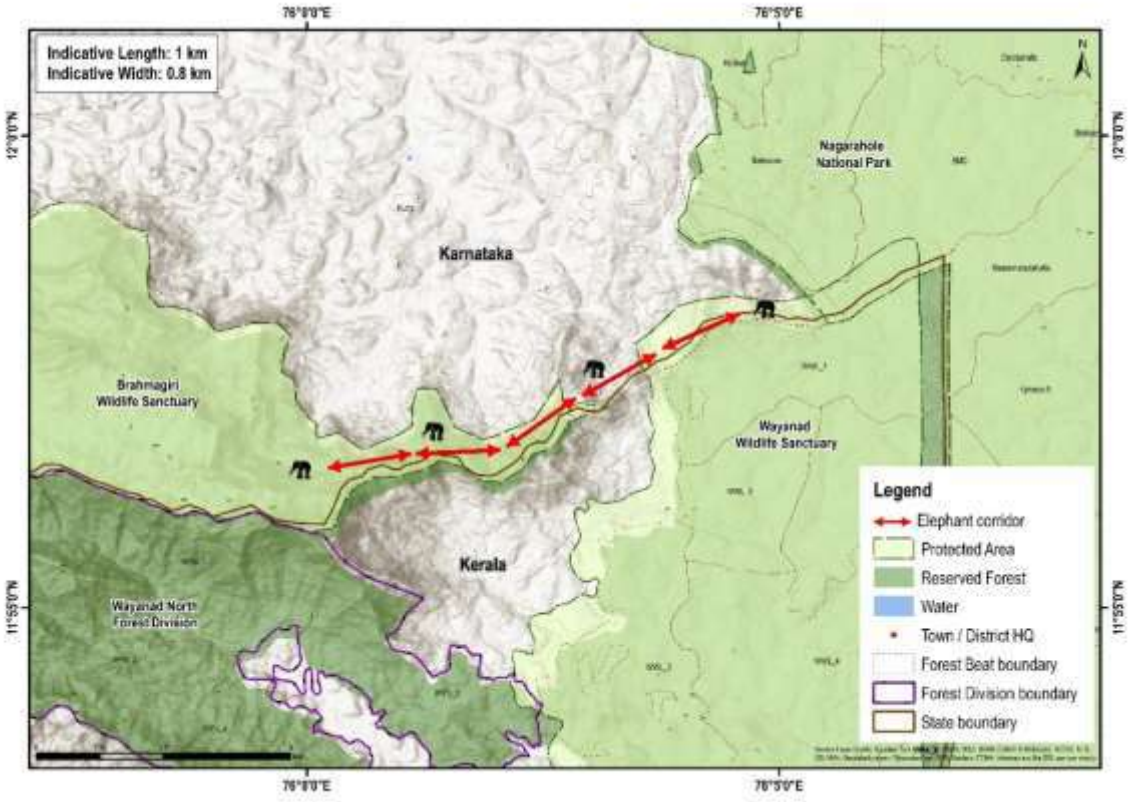
## 3. Kaniyanpura- Moyar Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects the Kaniyanpura Reserve Forest with the Moyar Reserve Forest of Bandipur Tiger Reserve and is located on the inter-state boundary of Karnataka and Tamil Nadu.** |
| **State** | Karnataka |
| **Indicative length and width** | Length = 3 km, width = 0.4 km |
| **Geo coordinates** | 11° 37' 1", 11° 39' 6" N<br>76° 38' 22", 76° 44' 49" E |
| **Forest ranges falling within corridor** | Kundakere Range |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Dry deciduous and mixed thorn forest |
| **Major land use** | Agricultural land, Plantations |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | 1) Mangala-Jakkahalli-Yelchetti road<br>2) The emergence of resorts near the corridor |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the state forest department.<br>2) Reduce dependency of fringe villagers on the corridor forest through suitable eco-developmental support and assistance.<br>3) More area (south of the Mangala-Jakkahalli-Yelchetti road) could be secured to widen the corridor at its bottleneck. The Karnataka Forest Department has plans to add more area to the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



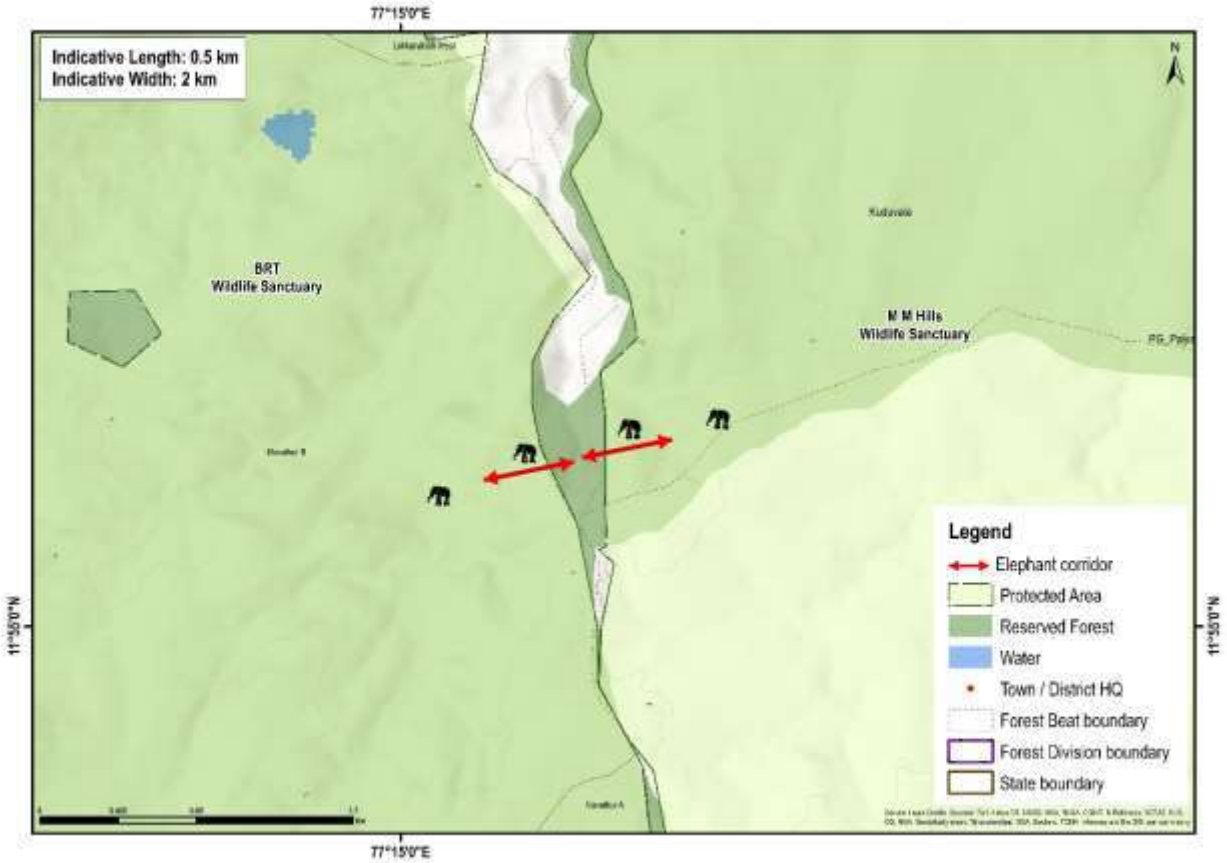
## 4. Begur – Brahmagiri Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Begur Reserve Forest and the Tholpetty Range of Wayanad Wildlife Sanctuary with Brahmagiri Reserve Forest and the Srimangala Range of Brahmagiri Wildlife Sanctuary.** |
| **State** | Karnataka |
| **Indicative length and width** | Length = 1 km, width = 0.8 km |
| **Geo coordinates** | 11° 55' 55"- 11° 57' 60" N<br>76° 0' 36"- 76° 4' 15" E |
| **Forest ranges falling within corridor** | Tholpetty and Srimangala Range |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Moist deciduous forest |
| **Major land use** | Coffee estate and human habitation |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | 1) Mananthavady-Kutta State Highway<br>2) Electric fences and Elephant Proof Trenches (EPTs) around the coffee estates |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the state forest department and legally protected under an appropriate law to prevent encroachment and development activities detrimental to animal movement.<br>2) Electric fences and EPTs in the corridor area should be removed on a priority basis.<br>3) About 375 acres of land identified in the Huvinakadu and Faith Coffee Estates in Karnataka needs to be secured in consultation with the management of these estates. Similarly, about 100 acres of land identified in the Narikkal Coffee Estate in Kerala should be secured for the long-term conservation of elephants in the region.<br>4) Inter-state border checkposts in the corridor area should be shifted.<br>5) No construction should be allowed on either side of the road passing through the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



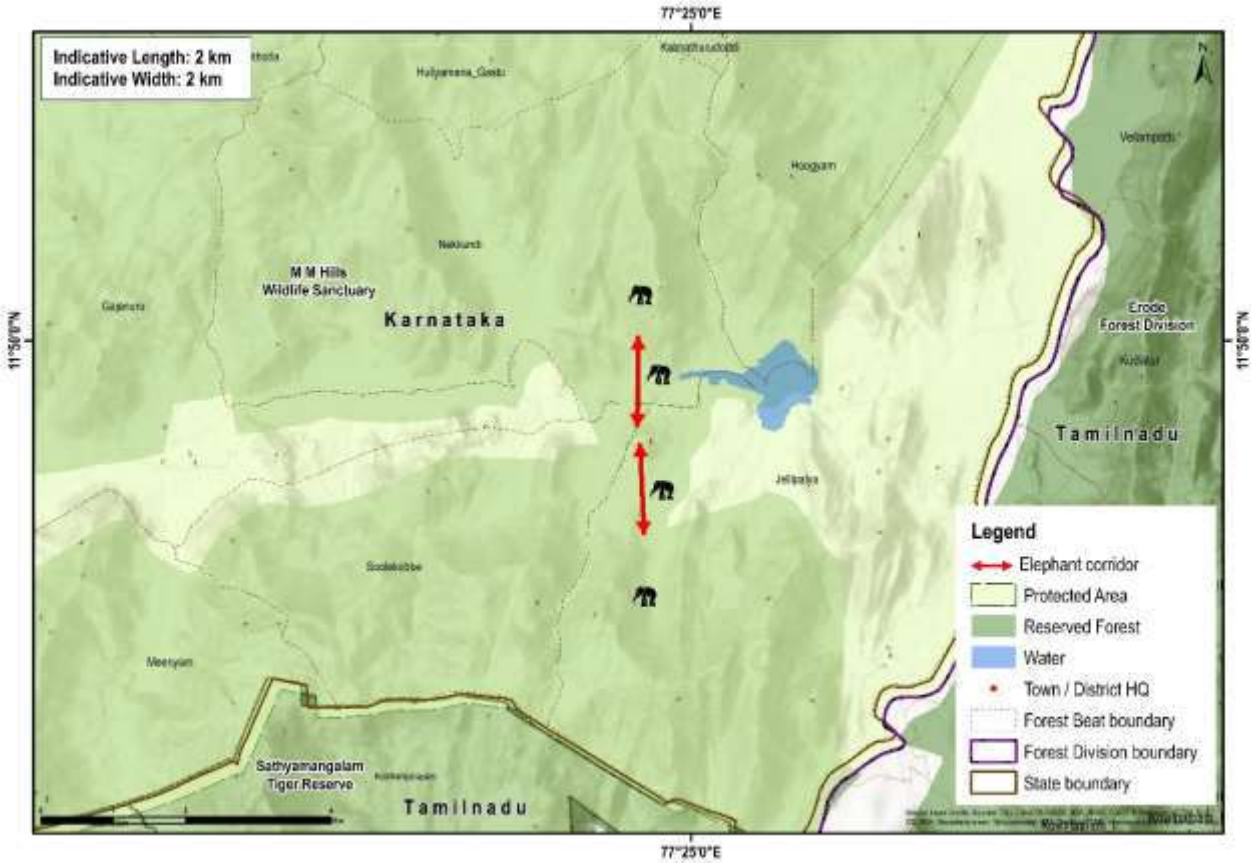
## 5. Edayarhalli – Doddasampige Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Edayarhalli Reserve Forest of Malai Madeshwara Wildlife Sanctuary with Doddasampige Reserve Forest of Biligiri Rangaswamy Temple (BRT) Tiger Reserve.** |
| **State** | Karnataka |
| **Indicative length and width** | Length = 0.5 km, width = 2 km |
| **Geo coordinates** | 11° 55' 12"- 11° 55' 52" N<br>77° 15' 21"- 77° 16' 1" E |
| **Forest ranges falling within corridor** | Bylore Range |
| **Revenue villages falling within corridor** | 6 |
| **Habitat type** | Tropical thorn and mixed deciduous forest |
| **Major land use** | Forest and agricultural land |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | Kollegal- Sathyamangalam (State Highway 38) |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the state forest department and legally protected under an appropriate law to prevent encroachment and developmental activities detrimental to animal movement.<br>2) Suitable eco-development activities need to be initiated in corridor fringe villages, especially to reduce fuel wood extraction and cattle grazing. Energy efficient cook stoves could be provided to the villagers to minimize fuel wood extraction |
| **Current status of the corridor** | Active. Information on intensity of use not available. |



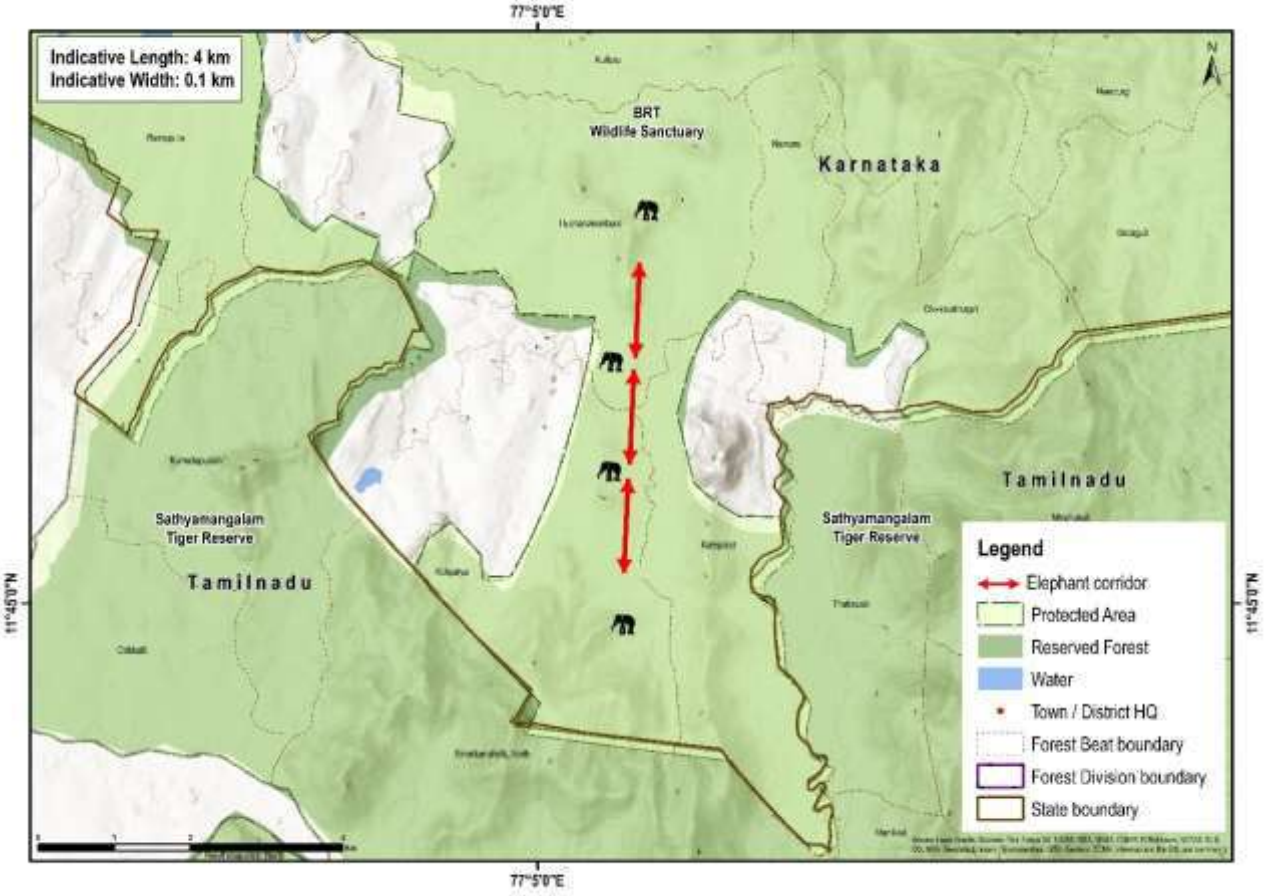
## 6. Edayarhalli – Guthiyalathur Corridor

| Connectivity | This corridor connects Malai Madeshwara Wildlife Sanctuary with Sathyamangalam Tiger Reserve |
|---|---|
| **State** | Karnataka |
| **Indicative length and width** | Length = 2 km, width = 2.1 km |
| **Geo coordinates** | 11° 48' 38"- 11° 49' 52" N<br>77° 23' 60"- 77° 25' 10" E |
| **Forest ranges falling within corridor** | Hoogyam Range |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Dry deciduous, mixed dry deciduous and shrub forests |
| **Major land use** | Human habitation |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | Encroachment by families in Kallatibyalur has further reduced the width of the corridor |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the state forest department and legally protected under an appropriate law to prevent encroachment and developmental activities detrimental to animal movement.<br>2) Encroachments in Kallatibyalur should be removed in consultation with settlers. |
| **Current status of the corridor** | Active. Information on intensity of use not available. |



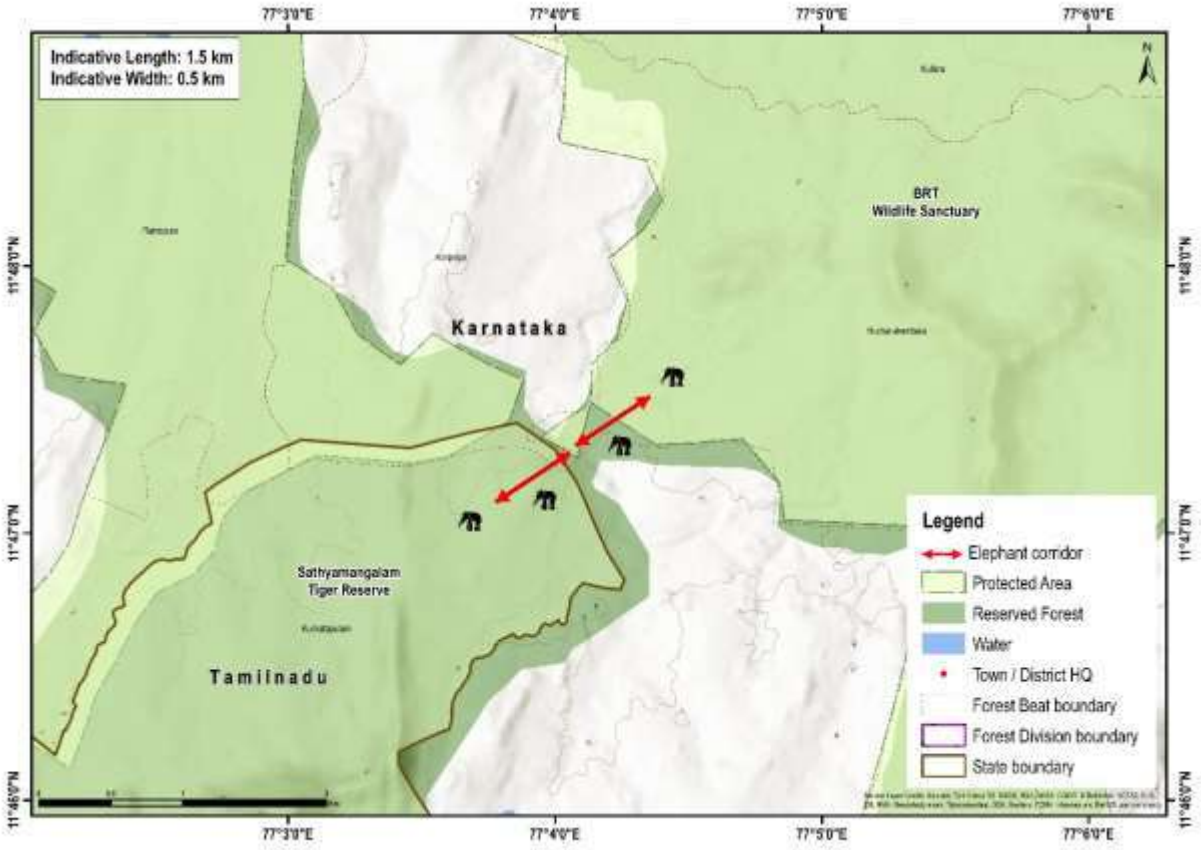
## 7. Chamarajanagar – Talamalai at Punjur Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the K Gudi Range of Chamarajanagar Wildlife Division (BRT Tiger Reserve) with the Thalavadi Range of Sathyamangalam Tiger Reserve through the Punjur Range.** |
| **State** | Karnataka |
| **Indicative length and width** | Length = 4 km, width = 0.1 km |
| **Geo coordinates** | 11° 46' - 11° 47' N<br>77° 05'- 77° 06' E |
| **Forest ranges falling within corridor** | K Gudi and Thalavadi Range |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Human habitation |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | National highway 209 and the associated vehicular traffic |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified and legally protected by the state forest department under an appropriate law, and action should be taken to prevent encroachment and developmental activities detrimental to animal movement.<br>2) In consultation with villagers, about 126 acres of the corridor land belonging to 86 families in the Hosaboddoddi and Srinivasapuram settlements needs to be secured on a priority basis. To further strengthen the corridor, efforts should be made to secure land from Muneeshwara Colony in the second stage, following due consultations with the local community.<br>3) No construction should be allowed on either side of NH 209 in the area passing through the corridor |
| **Current status of the corridor** | Impaired. |



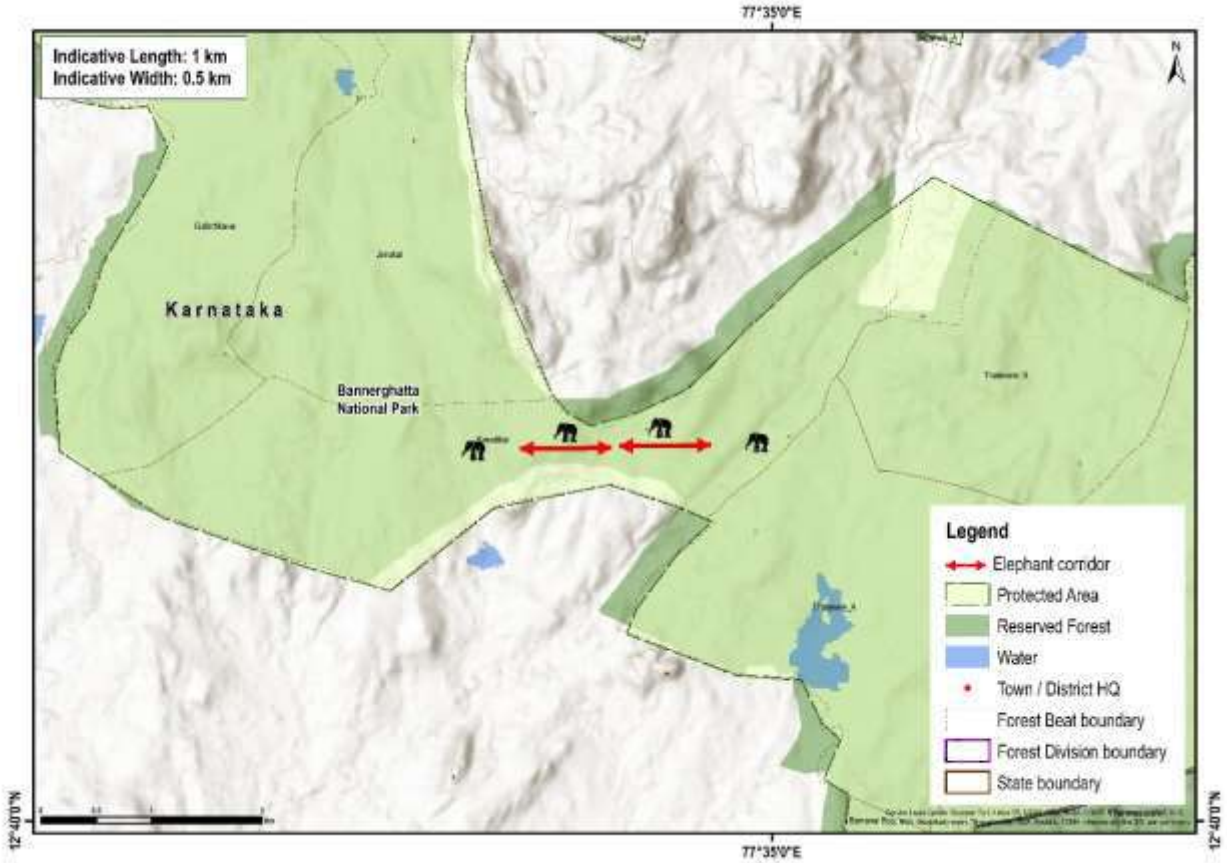
## 8. Chamarajanagar – Talamalai at Muddahalli Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Punjur Range of Chamarajanagar Wildlife Division (BRT Tiger Reserve) with the Thalavadi Range of Sathyamangalam Tiger Reserve and is located at the inter-state boundary of Karnataka and Tamil Nadu.** |
| **State** | Karnataka and Tamil Nadu |
| **Indicative length and width** | Length = 1.5 km, width = 0.5 km |
| **Geo coordinates** | 11° 47' 12"- 11° 47' 37" N<br>77° 3' 50"- 77° 4' 20" E |
| **Forest ranges falling within corridor** | Punjur and Thalavadi Range |
| **Revenue villages falling within corridor** | 6 |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forests and settlements |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | National highway 209 and the associated vehicular traffic |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified and legally protected by the state forest department under an appropriate law, and action should be taken to prevent encroachment and developmental activities detrimental to animal movement.<br>2) In consultation with villagers, 27.39 acres of land belonging to six families from Goramadu Doddi, and 10 acres of forest leased land from the Muddahalli Joint Farming Cooperative Society, should be secured as a priority to increase the width of the corridor.<br>3) No construction should be allowed on either side of the national highway passing through the corridor.<br>4) In consultation with the National Highway Authority of India, speed breakers should be created on the stretch passing through the corridor to minimize vehicular speeds and facilitate elephant movement. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



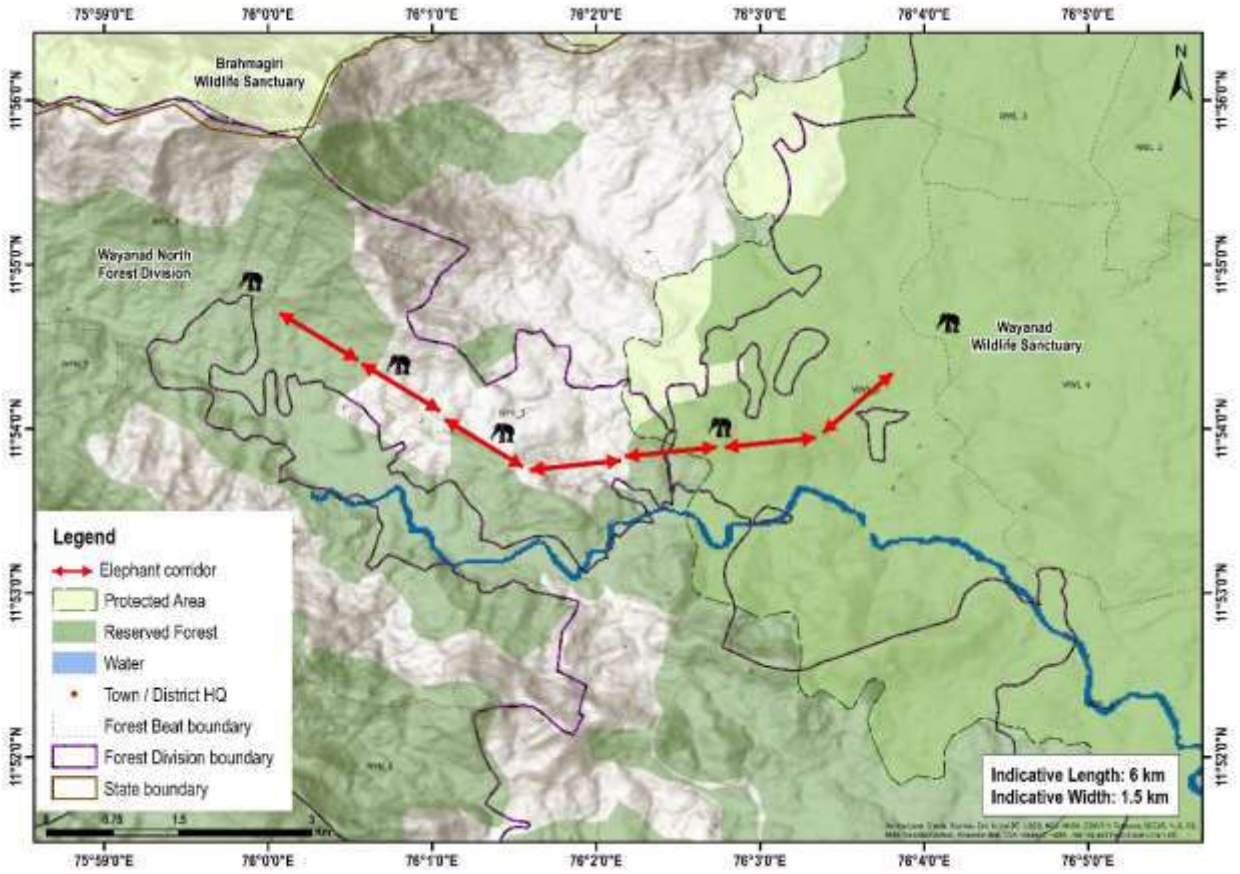
## 9. Karadikkal – Madeshwara Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Karadikkal State Forest and Madheshwara State Forest of Bannerghatta National Park, Karnataka.** |
| **State** | Karnataka |
| **Indicative length and width** | Length = 1 km, width = 0.5 km |
| **Geo coordinates** | 12° 41' 29"- 12° 42' 30" N<br>77° 33' 46"- 77° 34' 49" E |
| **Forest ranges falling within corridor** | Harohalli Range |
| **Revenue villages falling within corridor** | 6 |
| **Ecological importance** | This area facilitates the movement of elephants from Bannerghatta to Hosur Forest Division in Tamil Nadu, further leading on to Cauvery Wildlife Sanctuary, Karnataka. |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forests |
| **Elephant movement status** | Regular |
| **Linear infrastructure in the corridor** | 1) Stone quarries inside Bannerghatta National Park.<br>2) Anekal-Harohalli State Highway and associated vehicular traffic.<br>3) Resorts being developed on the southern boundary of the corridor at Jayapuradoddi |
| **Recommendations by the forest department to improve the corridor** | 1) The corridor should be notified by the state forest department and legally protected under an appropriate law to prevent encroachment and developmental activities detrimental to animal movement.<br>2) A total of about 87 acres of land belonging to private estates could be secured to increase the width of the corridor from 510 m to 1000 m.<br>3) Mining and stone quarries near the corridor need to be prohibited |
| **Current status of the corridor** | Active. Information on intensity of use not available. |



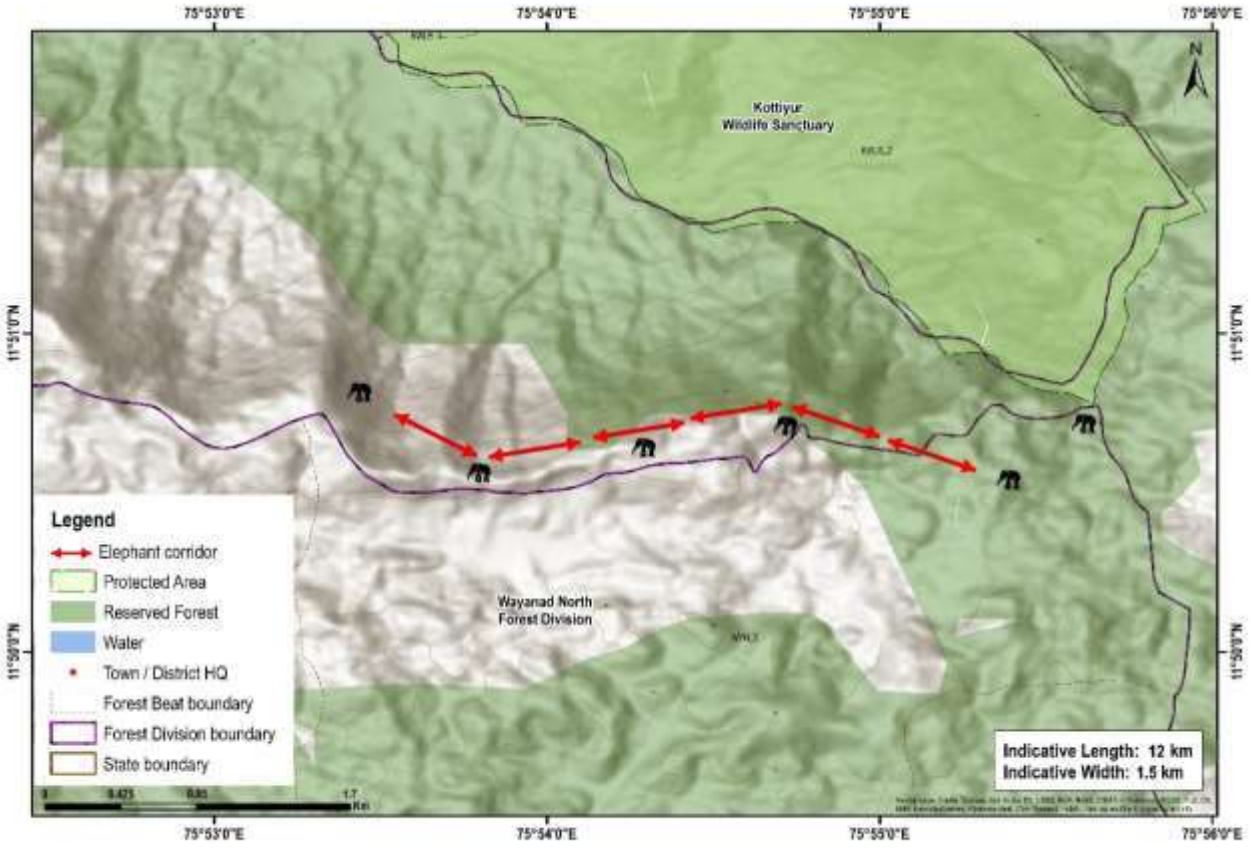
## 10. Kudrakote- Thirunelli Corridor

| | |
|---|---|
| **Connectivity** | **Connectivity is from Tholpetty Range of Wayanad Wildlife Sanctuary to Appapara station of Begur Range of the North Wayanad Division** |
| **State** | Kerala |
| **Indicative length and width** | Length = 6 km, width = 1.8 km |
| **Geo coordinates** | 11.899945˚ N, 76.012624 ˚E to 11.892096 ˚N , 76.075286 ˚E |
| **Forest ranges falling within corridor** | Thopetty, Appapara and Begur ranges |
| **Revenue villages falling within corridor** | 3 |
| **Habitat type** | Forest and forest plantations |
| **Major land use** | Teak plantations with secondary vegetation growth |
| **Elephant movement status** | Regular |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) Thetturoad- Thirunelly Road- 1.6 km<br>2) Panavally- Appapara Road- 9 km<br>3) Hgh tension power line (220 KV)- 1.6 km<br>4) Electric fence- 8 km<br>5) Elephant proof trench- 6 km |
| **Bottleneck in the corridor** | Stretch between Pulivalmoola to Appappra and Panavally, where the width is reduced. Additionally, a HT line and a minor road further impede the movement. |
| **Recommendations by the Forest Department to improve the corridor** | 1) Habitat enhancement of forest.<br>2) Check on the vehicular movement and restriction on the nighttime movement on Thetturoad- Thirunelly Road. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



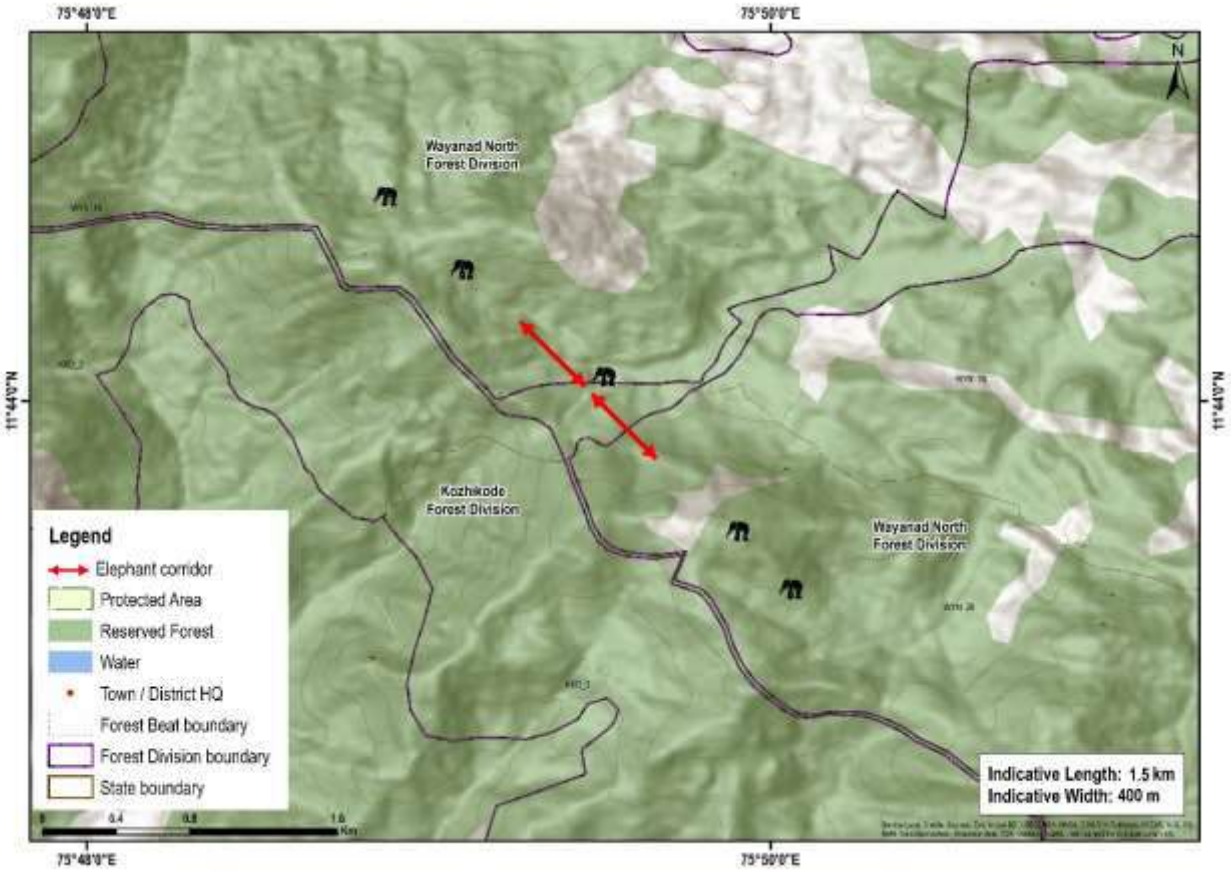
## 11. Kottiyur- Peria Corridor

| Connectivity | Connectivity is from Kottiyur Wildlife Sanctuary to Peria Reserve Forest of Peria Range |
|---|---|
| State | Kerala |
| Indicative length and width | Length = 12 km; width = 1.5 km |
| Geo coordinates | 11.848266˚N, 75.817852˚E to 11.847653˚N , 75.929685˚E |
| Forest ranges falling within corridor | Peria Range |
| Revenue villages falling within corridor | 2 |
| Ecological importance | This is the narrowest corridor in the division and is characterized by dense human population, making this corridor important for the movement of the elephants from Peria Reserve Forest. |
| Habitat type | Evergreen forests and scattered grassland |
| Major land use | Forest = 835 ha<br>Agriculture = 85 ha<br>Habitation = 30 ha |
| Elephant movement status | Occasional, the movement has decreased. |
| Number of elephants using the corridor | Not recorded by forest department |
| Linear infrastructure in the corridor | 1) Boystown- Kottiyur Hill highway<br>2)High tension power line from Chandanathodu to Peria (440 KV), 3 km<br>3) Electric fence, 12 km<br>4) Boystown, Varayal Forest station building |
| Bottleneck in the corridor | Kottiyur road running along the stream creates a steep and inaccessible terrain for elephants. |
| Recommendations by the forest department to improve the corridor | 1) Establishment of elephant specific overpass across Boystown- Kottiyur road.<br>2) Construction of underpass along the Thalasery- Mananthavady road at Peria between district border and Peria 35.<br>3) Acquiring estates within forested areas<br>4) Considering ban on the erection of electric fences for preserving their natural movement. |
| Current status of the corridor | Active. Intensity of use by elephants decreased. |



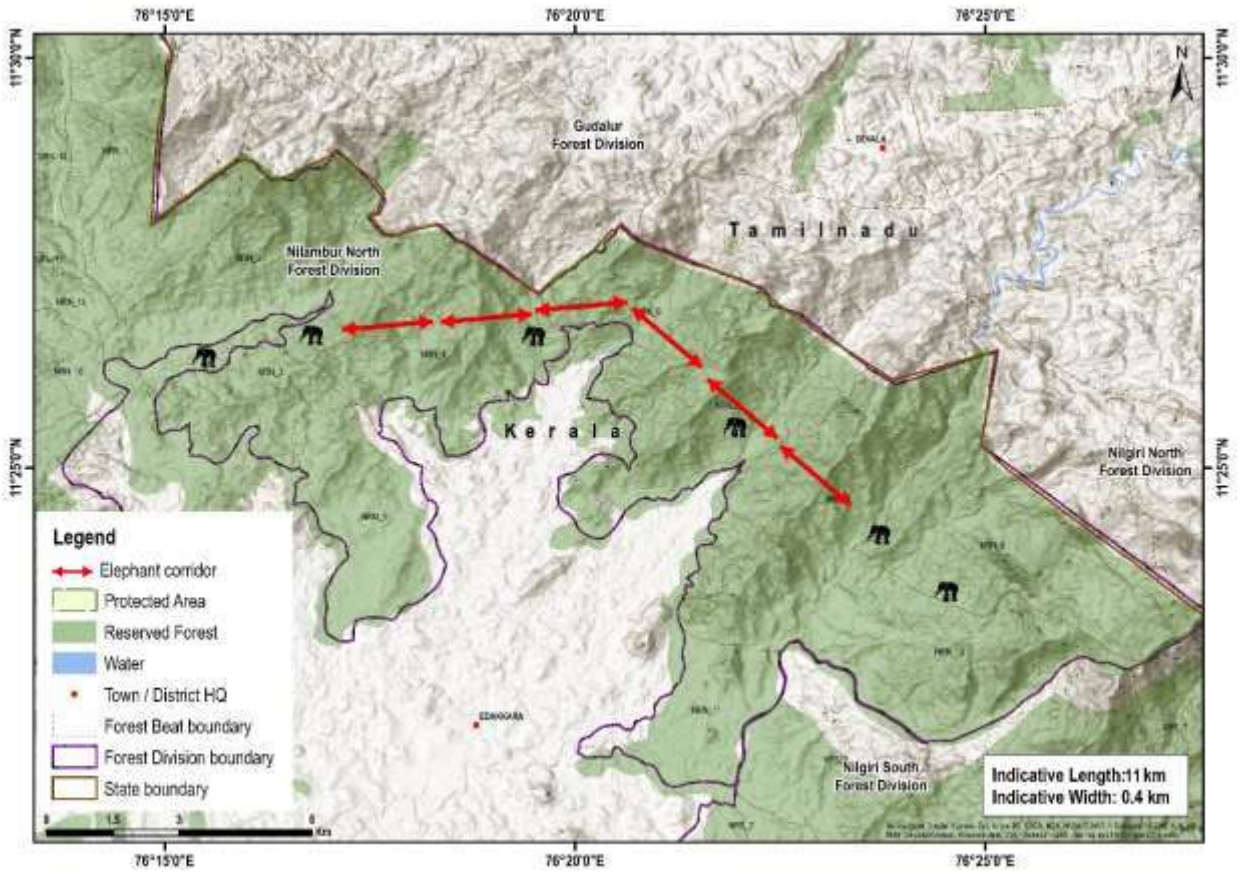
## 12. Peria- Pannippad (Peria at Pakranthalam) Corridor

| Connectivity | Connectivity is from Peria Reserve Forest of Peria Range to Mananthavady Range, Kozhikode Division and South Wayanad Division |
|---|---|
| **State** | Kerala |
| **Indicative length and width** | Length = 1.5 km; width = 400 m |
| **Geo coordinates** | 11.726990˚ N, 75.828181 ˚E to 11.740851˚ N , 76.820213 ˚E |
| **Forest ranges falling within corridor** | Peria and Mananthavady Ranges |
| **Revenue villages falling within corridor** | Information NA |
| **Ecological importance** | The corridor plays significant role in maintaining ecological as well as genetic connectivity and diversity between the elephant populations of Peria Reserve Forest, Kozhikode Forest Division and South Wayanad Forest Division for elephants and other wildlife. |
| **Habitat type** | Evergreen Forest |
| **Major land use** | Forest = 85 ha<br>Agriculture = 14 ha<br>Habitation = 1 ha |
| **Elephant movement status** | Occasional, the movement has increased |
| **Number of elephants using the corridor** | Not recorded by forest department |
| **Linear infrastructure in the corridor** | 1) Mananthavady Kuttiyadi Road and its associated traffic.<br>2) Electric fence along the boundaries of the private land.<br>3) Mobile tower<br>4) Resorts |
| **Bottleneck in the corridor** | Private area between the Peria and Mananthavady range and Mananthavady Kuttiyadi Road. |
| **Recommendations by the forest department to improve the corridor** | 1) Acquiring land from the nearby estates<br>2) Relocation of the mobile tower to a more suitable location. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



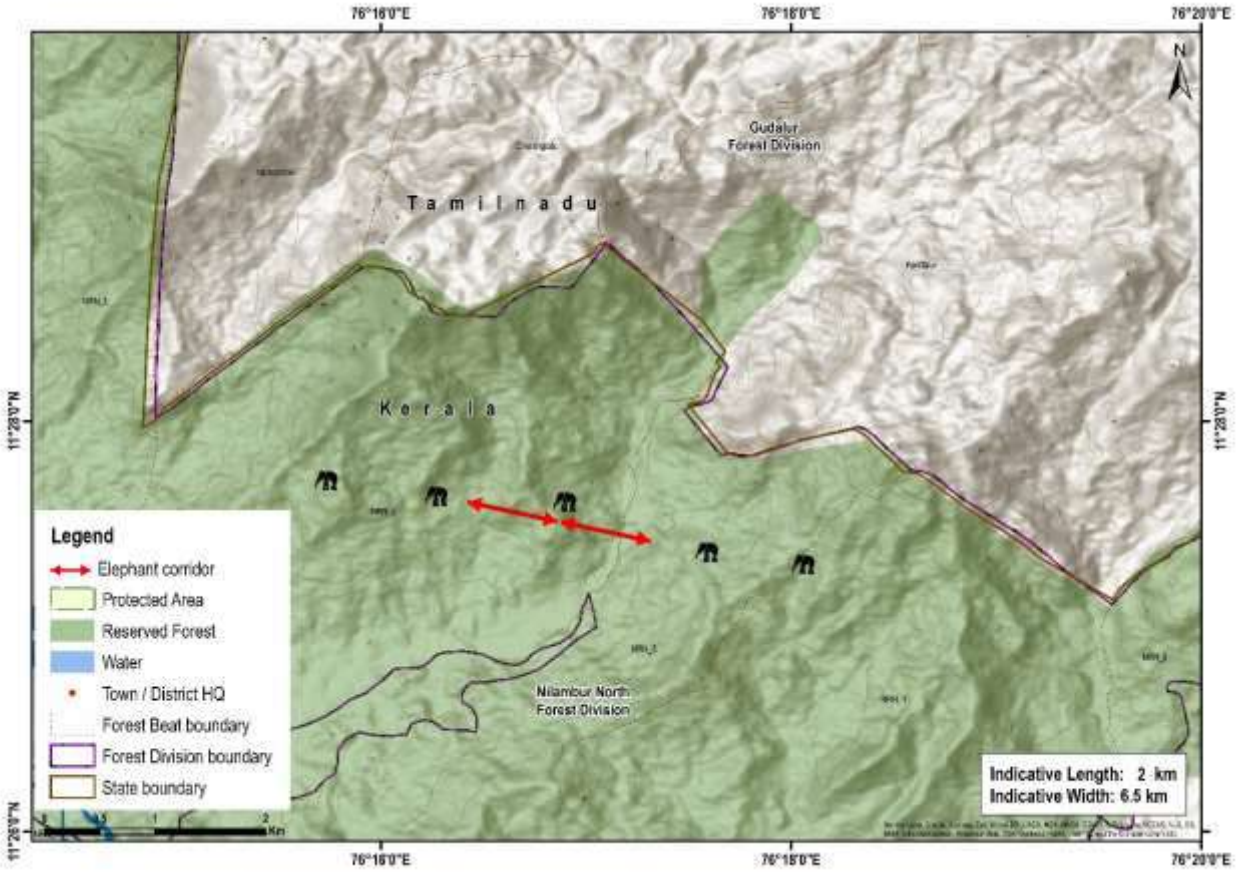
## 13. Nilambur Kovilakam- New Amarambalam Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Nilambur Kovilam Reserve Forest of Nilambur North Division (Vazhikkadavu area) with New Amarambalam Reserve Forest of Nilambur South Division in the Malappuram district.** |
| **State** | Kerala and Tamil Nadu |
| **Indicative length and width** | Length = 11 km; width = 0.4 km |
| **Geo coordinates** | N 11°23'12.71", E 76° 21'18.67"<br>N 11°26'30", E 76° 23'23" |
| **Forest ranges falling within corridor** | Vazhikadavu |
| **Revenue villages falling within corridor** | 4 |
| **Habitat type** | Moist Deciduous and Semi Evergreen forest |
| **Major land use** | Forest = 440 ha |
| **Elephant movement status** | Regular, the movement has increased. |
| **Number of elephants using the corridor** | 162 |
| **Linear infrastructure in the corridor** | 1) Calicut- Nilambur State Highway<br>2) Electric fence- 12 km but do not affect the elephant movement |
| **Bottleneck in the corridor** | CNG road, PCK Rubber plantation, Panchakolly |
| **Recommendations by the forest department to improve the corridor** | Restriction on the vehicular movement between 8 PM to 6 AM. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



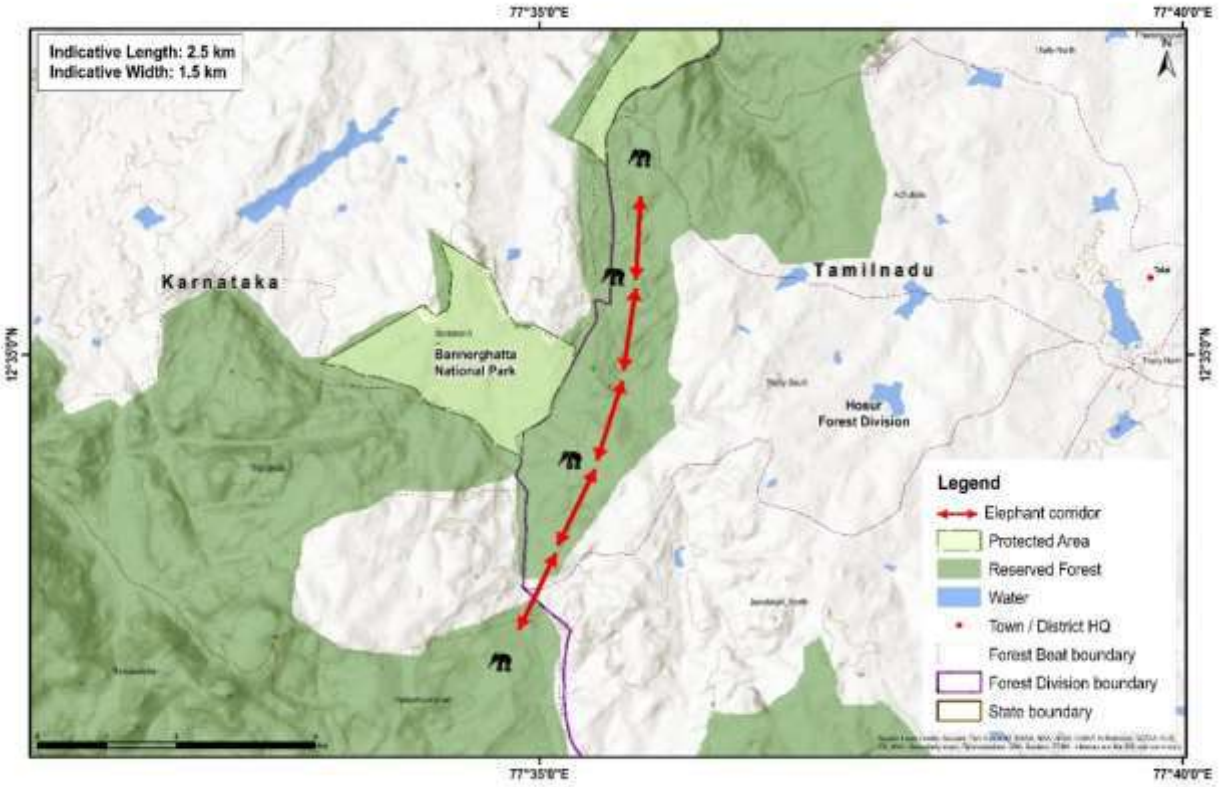
## 14. Nilambur- Appankappu Corridor

| Connectivity | This corridor connects the Vazhikkadavu and Nilambur Ranges of Nilambur North Division |
|---|---|
| State | Kerala |
| Indicative length and width | Length = 2 km, width = 6.5 km |
| Geo coordinates | 11.726990˚ N, 75.828181˚ E to 11.740851˚ N , 76.820213˚ E |
| Forest ranges falling within corridor | Vazhikkadavu and Nilambur Ranges |
| Revenue villages falling within corridor | 1 |
| Ecological importance | At the landscape scale, this corridor facilitates interstate movement of elephants between Kerala and Tamil Nadu |
| Habitat type | Moist deciduous forest |
| Major land use | Forest = 480 ha<br>Agriculture = 23.5 ha |
| Elephant movement status | Regular, the movement has increased. |
| Number of elephants using the corridor | 156 |
| Linear infrastructure in the corridor | Electric fence- 12 km but do not affect the elephant movement. |
| Bottleneck in the corridor | Appankappu 23.35ha agricultural land in Vellarampuzha |
| Recommendations by the forest department to improve the corridor | Acquiring land from the nearby estates. |
| Current status of the corridor | Active. Intensity of use by elephants increased. |



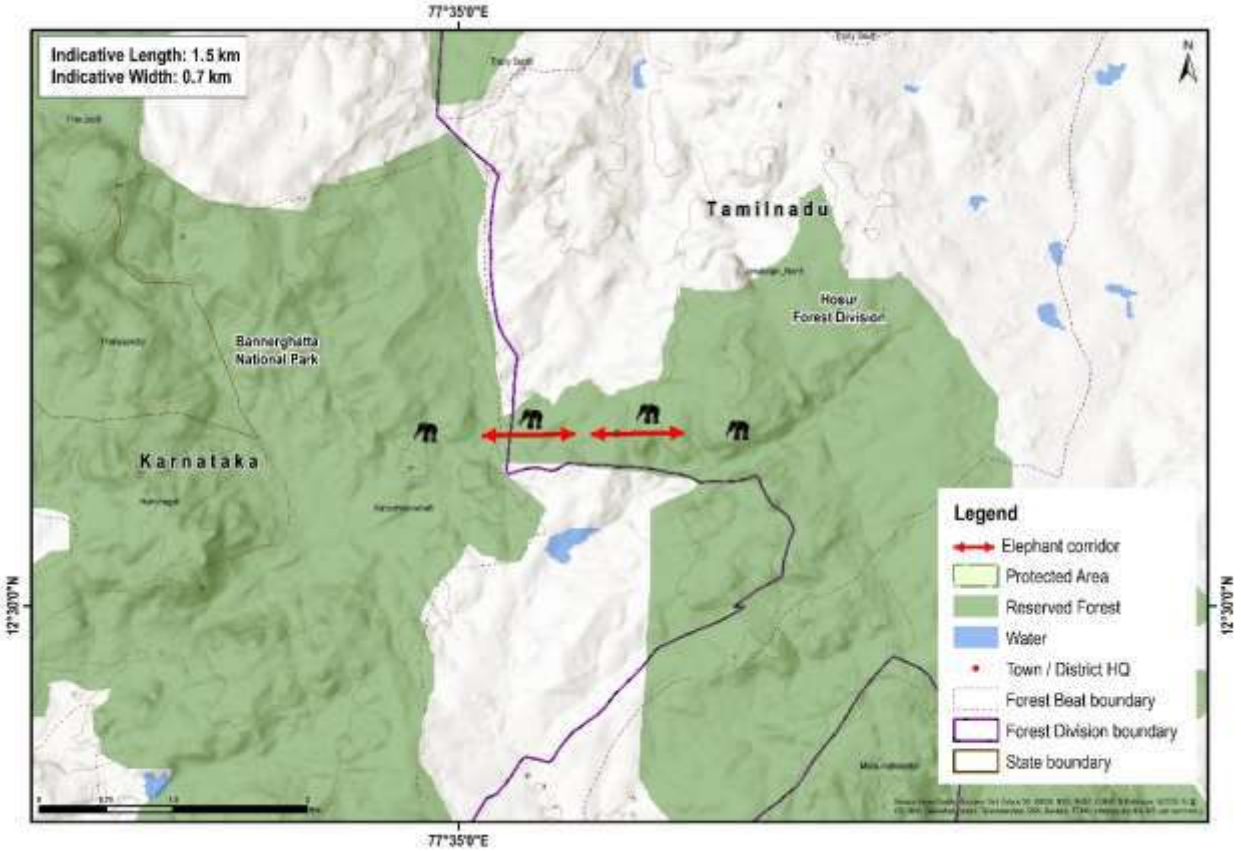
## 15. Thally – Bilikkal Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects the Bannerghatta National Park of Karnataka with the North Cauvery Wildlife Sanctuary of Tamil Nadu.** |
| **State** | Tamil Nadu and Karnataka |
| **Indicative length and width** | Length = 2.50 km, width = 1 km |
| **Geo coordinates** | 12.577567° N, 77.591290° E<br>12.535615° N, 77.579358° E. |
| **Forest ranges falling within corridor** | Jawalagiri and Kodihalli ranges |
| **Revenue villages falling within corridor** | 7 |
| **Habitat type** | Southern Tropical Dry Mixed Deciduous Forest |
| **Major land use** | Forest = 3302.35 ha<br>Agriculture = 500 ha<br>Habitation = 250 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 100 to 200 |
| **Major Bottleneck** | 1. Revenue land along the Dodduru – Belalam road that created a *ca.* 300-m gap in the habitat connectivity.<br>2. Elephant-proof barriers |
| **Linear infrastructure in the corridor** | 1) Road from Thally to Maralavadi via Belalam and Therubidhi.<br>2) Road from Elavanathe to Hosadoddi.<br>3) Road from Therbidi to Kadusivanapalli.<br>4) 765 kV S/C Transmission line from Dharmapuri (Salem) to Madhugiri (Karnataka) is passing through Thally RF<br>5) 765 kV S/C Transmission line from Dharmapuri (Salem) to Madhugiri (Karnataka).<br>6) Elephant proof trench formed about 3 km in Thally RF and 3 km in Bannerghatta National Park in the corridor area. |
| **Recommendations by the forest department to improve the corridor** | 1) The encroachment may be evicted in the corridor area.<br>2) Alternate revenue land near to the Town areas for the Patta holders / encroachers.<br>3) Habitat improvement works like removal of Invasive alien species, creation of waterholes and fodder plots inside the area will helps the elephant movement within the corridor. |
| **Current Status of the corridor** | Active. Intensity of use by elephants increased. |



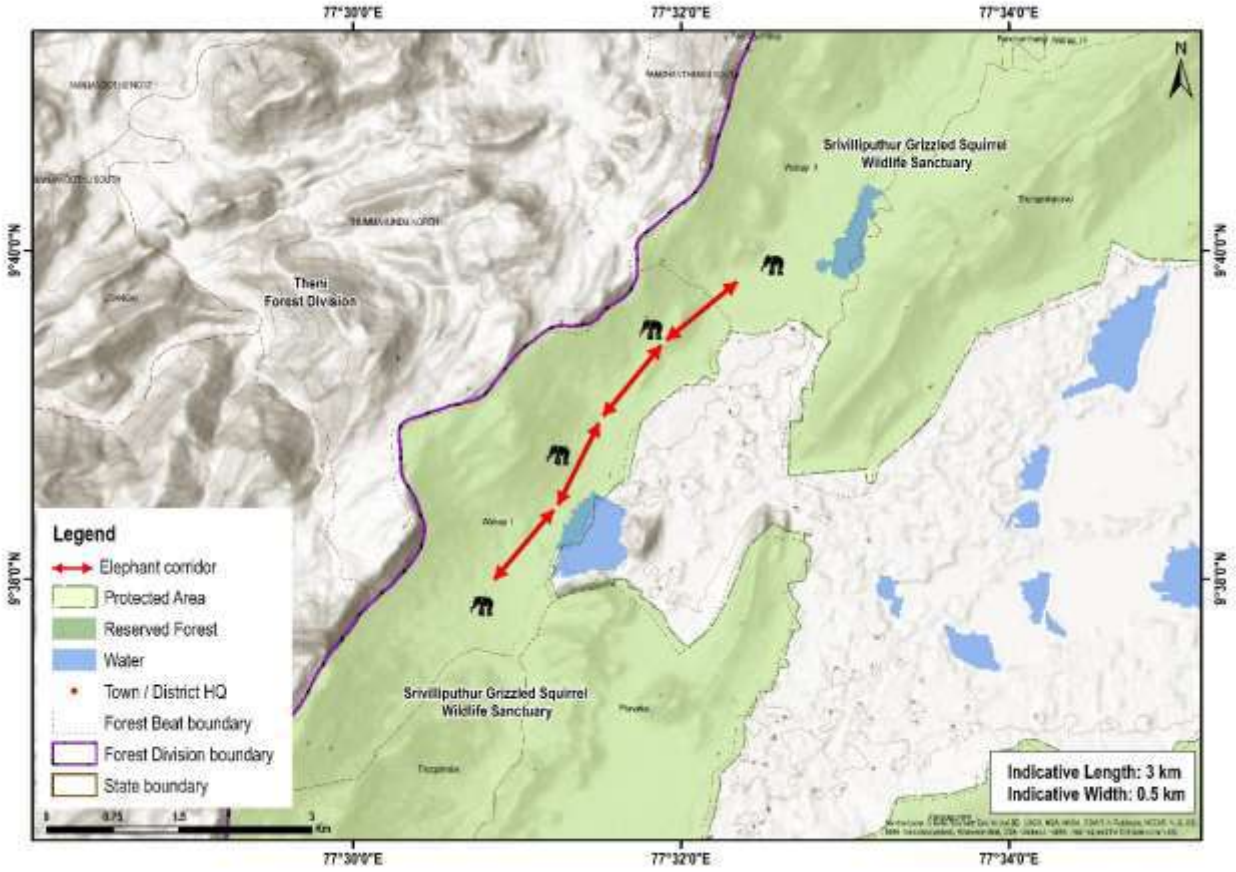
## 16. Bilikkal- Jawalagiri Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Bilikkal State Forest of Bannerghatta National Park, Karnataka, with Jawalagiri Reserve Forest of Cauvery North Wildlife Sanctuary, Tamil Nadu.** |
| **State** | Tamil Nadu and Karnataka |
| **Indicative length and width** | Length = 1.5 km, width = 0.7 km |
| **Geo coordinates** | 12.516164° N, 77.579524° E.<br>12.524220° N, 77.608672° E. |
| **Beats falling within corridor** | Jawalagiri North, Therubeedi, Yaluvantha and Kadusivanapalli Beat |
| **Forest ranges falling within corridor** | Jawalagiri (North Cauvery WLS), Kodihalli and Harohalli ranges (Bannerghatta NP) |
| **Revenue villages falling within corridor** | 0 |
| **Habitat type** | Southern Tropical Dry Mixed Deciduous Forest |
| **Major land use** | Forests<br>Jawalagiri Reserved Forest = 3141.58 ha<br>Bilikkal State Forest = 3500 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Around 200 |
| **Major bottleneck** | Bandemuthappa temple in the Bilikkal State Forest areas along with the road that connecting to the temple located in the Bannerghatta National Park in Karnataka. |
| **Linear infrastructure in the corridor** | 1) Road from Belalam and Kadusivanapalli.<br>2) Road from Elavanathe to Kadukempathpalli |
| **Recommendations by the forest department to improve the corridor** | 1) Habitat improvement works like removal of Invasive alien species, creation of waterholes and fodder plots inside the area will helps the elephant movement within the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



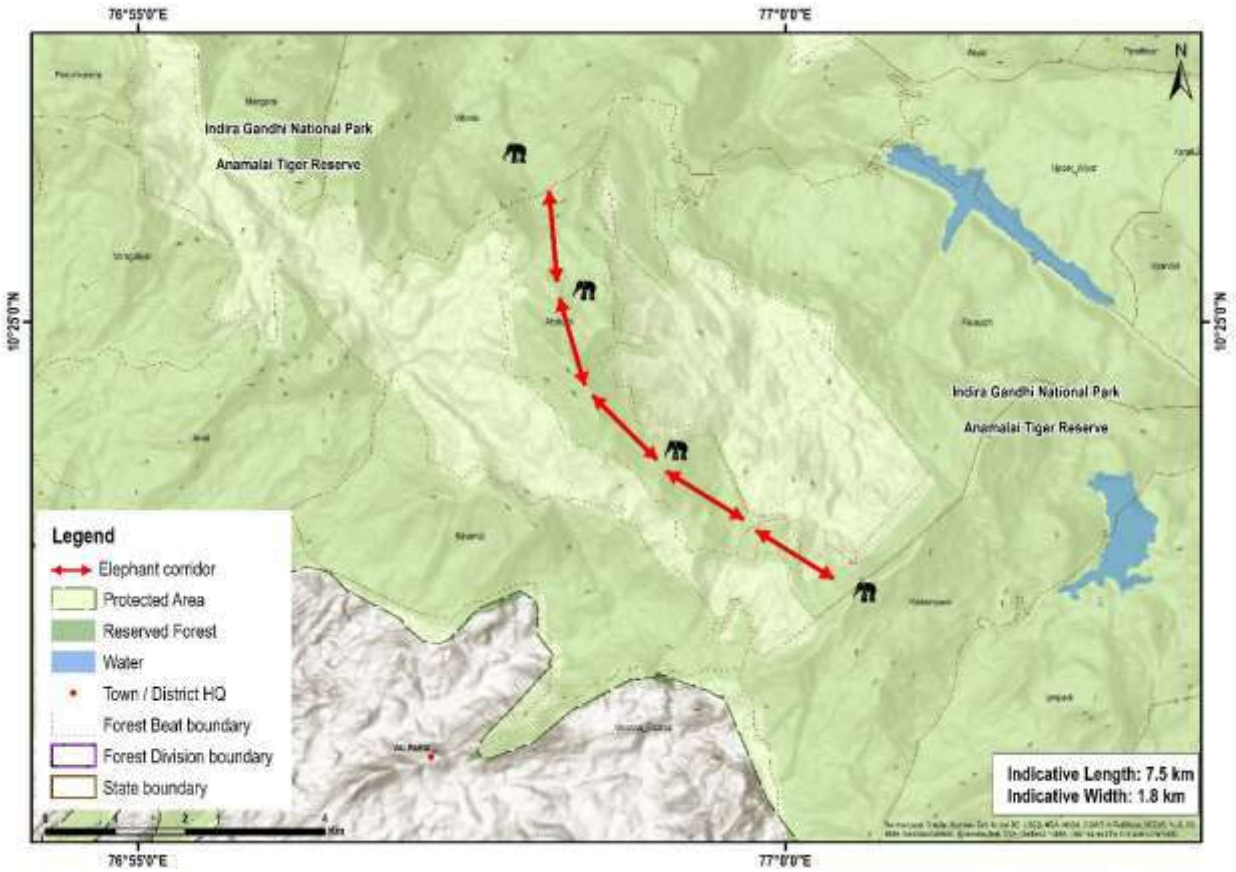
## 17. Srivilliputtur – Saptur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Saptur Reserve Forest with Srivilliputhur Reserve Forest of the Srivilliputhur Grizzled Squirrel Sanctuary.** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 3 km, width = 0.5 km |
| **Geo coordinates** | N 9° 38' 3'', E 77° 30' 39''<br>N 9° 39' 48'', E 72° 32' 14'' |
| **Beats falling within corridor** | Beat I, II of Watrap range in Srivilliputtur sanctuary. |
| **Forest ranges falling within corridor** | Watrap range |
| **Revenue villages falling within corridor** | 0 |
| **Ecological importance** | This is a very important corridor facilitating movement of elephants in the South Western Ghats landscape complex comprising of Theni and Madurai Forest Divisions, and Srivilliputtur Wildlife Sanctuary, Megamalai Wildlife Sanctuary and the Periyar Tiger Reserve in Kerala. |
| **Habitat type** | Dry deciduous forest and agricultural lands |
| **Major land use** | Forest = 60.70 ha<br>Agriculture = 75.70 ha |
| **Elephant movement status** | Seasonal |
| **No. of elephants using the corridor** | Around 20 - 30 |
| **Major bottleneck** | Narrow forest patch between the two forest ranges |
| **Linear infrastructure in the corridor** | 1) Canal, 2km<br>2) Power fence, 3 km |
| **Recommendations by the forest department to improve the corridor** | 1) Increasing the width of the corridor is crucial<br>2) Regulation of tourism activities. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



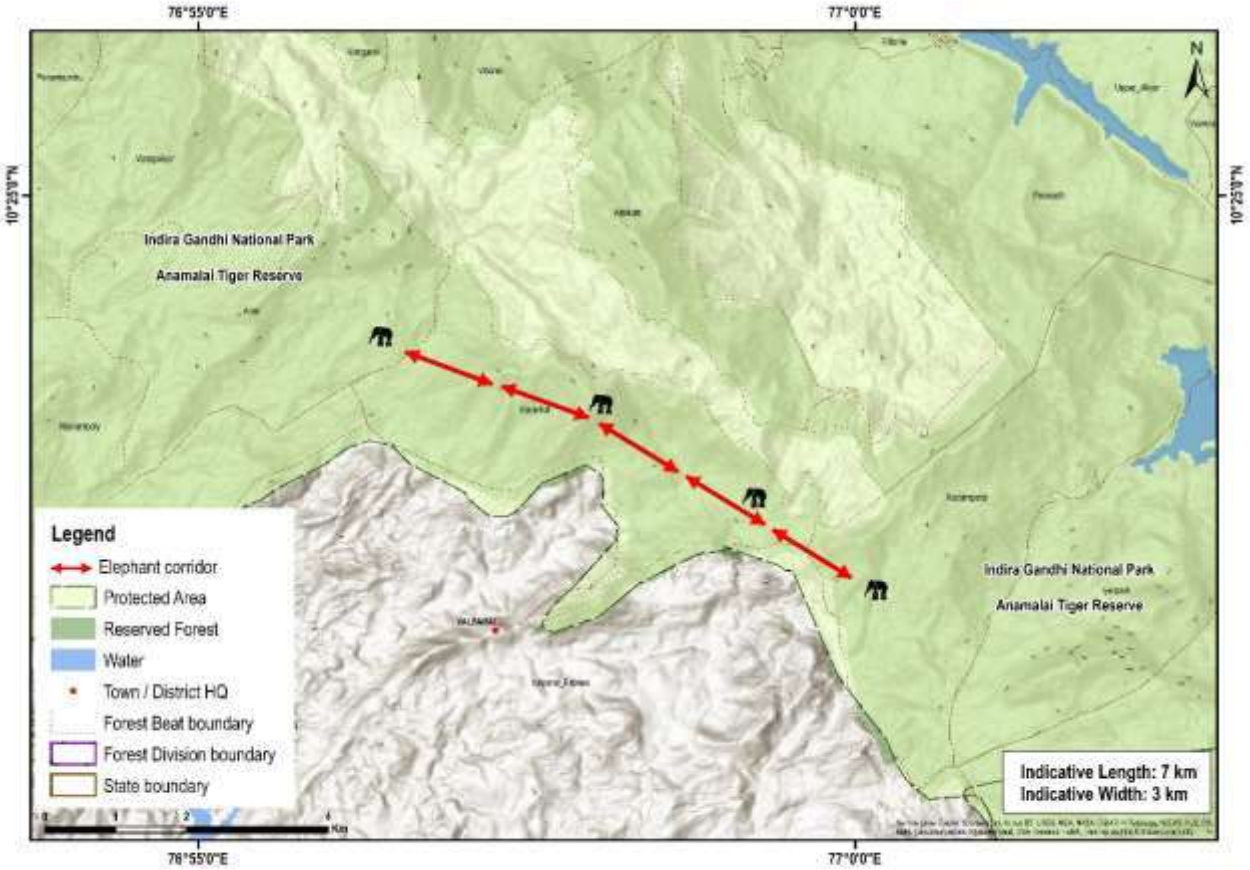
## 18. Anaimalai at Waterfalls Estate Corridor

| | |
|---|---|
| **Connectivity** | **This corridor links the habitats of the Valparai and Pollachi Ranges of the Anaimalai Tiger Reserve.** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 7.5 km, width = 1.8 km |
| **Geo coordinates** | N 10° 22' 42", E 77° 0' 31"<br>N 10° 26' 15", E 76° 57' 42" |
| **Forest ranges falling within corridor** | Valparai and Pollachi ranges of Anamalai Tiger Reserve |
| **Revenue villages falling within corridor** | 0 |
| **Ecological importance** | This is an important corridor to connect the western part of the Anamalai Tiger Reserve to the east. Many herds of elephants and solitary individuals use this corridor for local migration. This is an important corridor for tigers (*Panthera tigris*) too. |
| **Habitat type** | Tropical moist deciduous forest |
| **Major land use** | Tea plantations and forest |
| **Elephant movement status** | Seasonal, majorly between March- August |
| **No. of elephants using the corridor** | Information on intensity of use not available. |
| **Major bottleneck** | 1) State Highway 78 (Pollachi- Valparai) at Andiparai shola<br>2) Tea estates like Waterfall and Waverly |
| **Linear infrastructure in the corridor** | 1) 1.8km of State Highway 78 and associated high vehicular traffic<br>2) Tea factories of the estate |
| **Recommendations by the forest department to improve the corridor** | 1) Regulating the road work undertaken, with special attention towards use of JCB and construction of revetment walls by the Highway department.<br>2) Regulating the number and speed of vehicles passing through the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable |



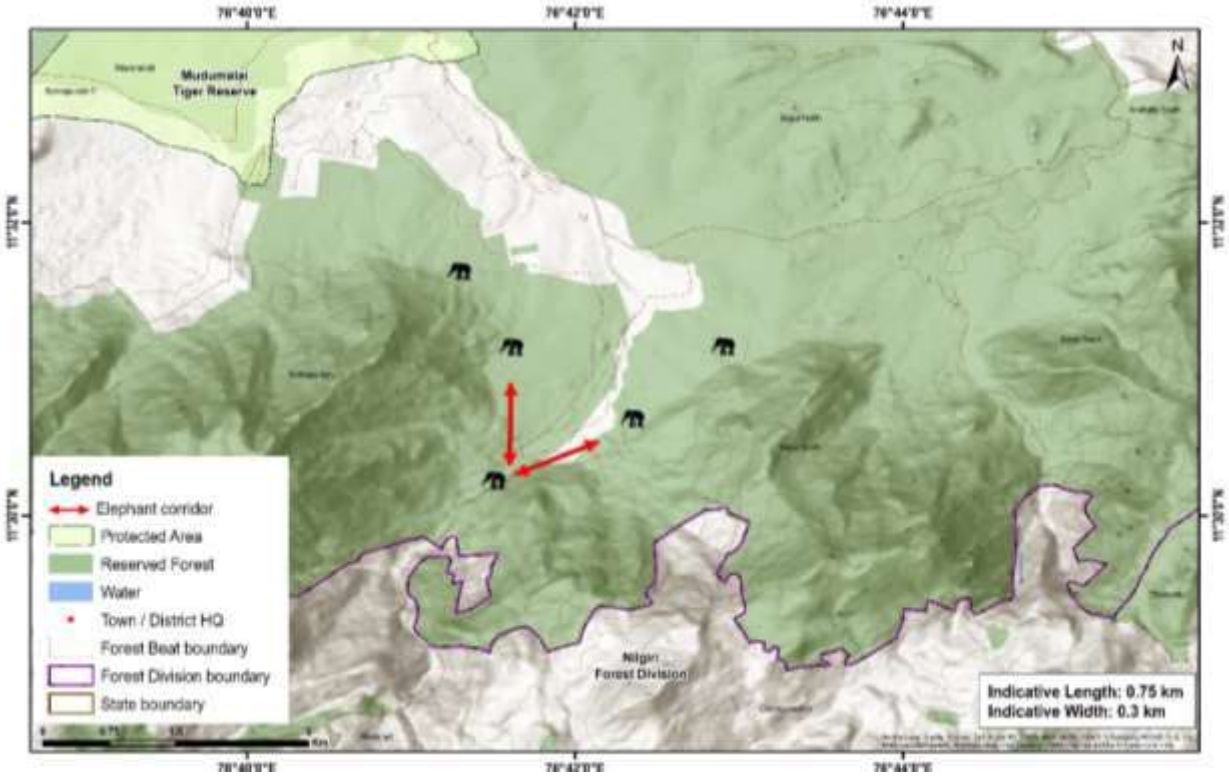
## 19. Siluvaimedu – Kadamparai Corridor

| | |
|---|---|
| **Connectivity** | **This corridor links the habitats of the Valparai and Manambolly Ranges of Anaimalai Tiger Reserve.** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 7 km, width = 2.7 km |
| **Geo coordinates** | N 10°24'34" - E 76°56'15",<br>N 10°21'45" - E 77°0'14" |
| **Forest ranges falling within corridor** | Valparai, Mananbolly and Pollachi ranges of Anamalai Tiger Reserve |
| **Revenue villages falling within corridor** | 1 |
| **Ecological importance** | This corridor connects the ranges of Valparai and Manambolly of Anamalai Tiger Reserve that extends till Parambikulam Tiger Reserve. This landscape also harbors high number of micro habitats like swamps that are favoured by elephants. |
| **Habitat type** | Tropical moist deciduous forest |
| **Major land use** | Forest<br>Tea plantations |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | Around 50 |
| **Major bottleneck** | Private estates near Iyerpadi shola |
| **Linear infrastructure in the corridor** | 1) 1.8 km of State Highway 78, and associated high vehicular traffic<br>2) Tea factories of the estate |
| **Recommendations by the forest department to improve the corridor** | 1) Encouraging people to use LPG instead of fuel wood to ease the pressure on corridor.<br>2) Regulation on the vehicular movement on State Highway 78.<br>3) Regulation on the tourism. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



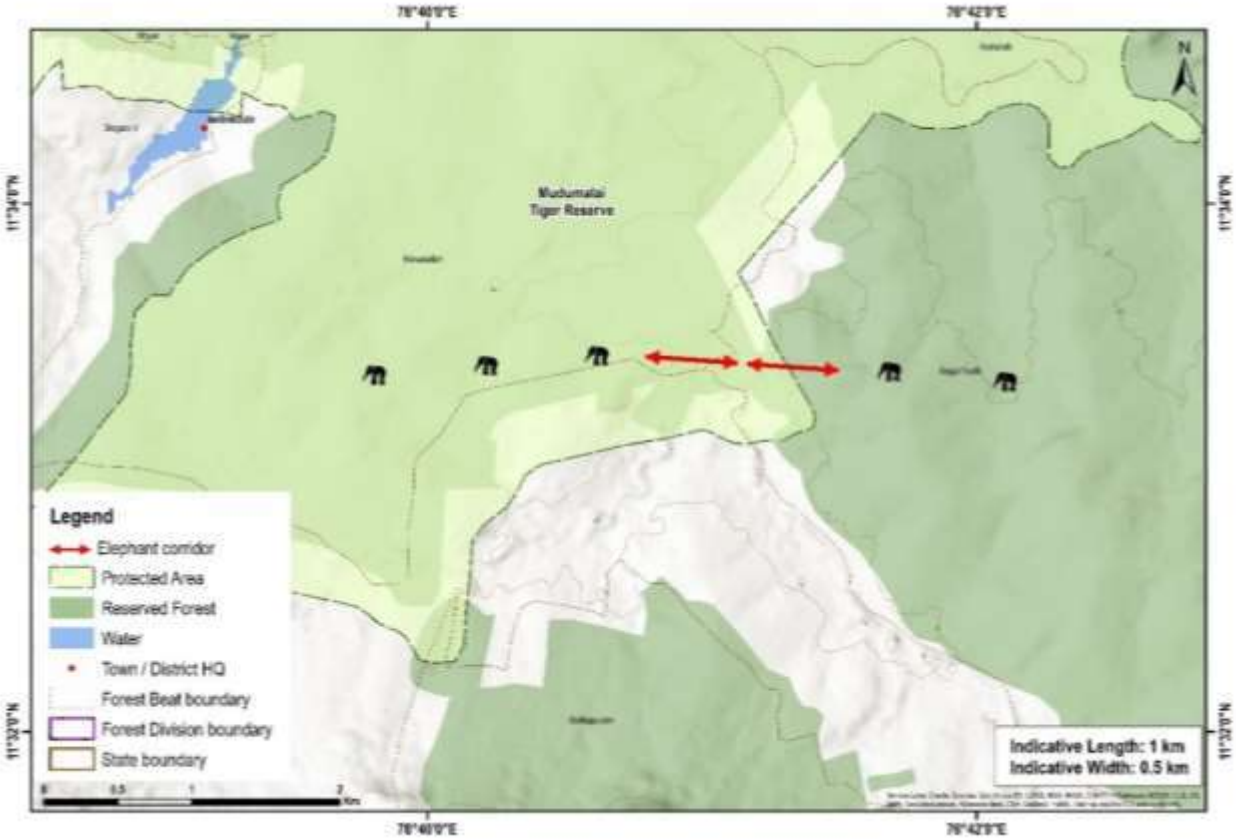
## 20. Kallhatti- Segur at Glencorin Corridor (Segur Corridor-1)

| | |
|---|---|
| **Connectivity** | **This corridor connects Kalhatti RF with Singara RF and is part of the Segur corridor with an extent of 3413.73 hectares covering four corridors declared as a Segur Plateau Elephant Corridor vide G.O.Ms No 125 E & F (FR.5) Dept Dated 31.08.2010** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 23.5 km, width = 1.5 km |
| **Geo Coordinates** | **1) N- 11.521750°, E- 76.53937°** 2) N- 11.539190°, E- 76.64606° 3) N- 11.523191°, E- 76.73430° 4) N- 11.559855°, E- 76.68879° |
| **Forest ranges falling within corridor** | Segur, Singara and Masinagudi Ranges |
| **Revenue villages falling within corridor** | 8 |
| **Ecological importance** | Segur corridors are critical in facilitating elephant movement in the larger Mudumalai – Bandipur – Wayanand – Sathyamangalam complex of Western Ghats |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forest = 61,392 ha, Agriculture = 1,193 ha<br>Habitation = 195.40 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 61 (for the entire series of 4 Segur corridors as estimated by the forest department during the year 2023) |
| **Major bottleneck** | Habitations at Mavanallah, Bokkapuram and flume channel running across the Corridor from Masinagudi to Moyar |
| **Linear infrastructure in the corridor** | 1) State Highway (Stretch I- 4.77 km, Stretch II- 1.71 km) and associated high traffic<br>2) 7 km of concrete flume hannel that runs from Masinagudi to Moyar<br>3) 2.09 km of Northern Hay and 3.27 km of Singara HT power lines<br>4) Establishments like schools, settlement, resorts and tourism infrastructure |
| **Recommendations by the forest department to improve the corridor** | 1) Acquiring land at crucial bottle neck points.<br>2) Reengineering of canal and flume channel to facilitate wildlife movement<br>3) Regulation of tourism activities. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable |



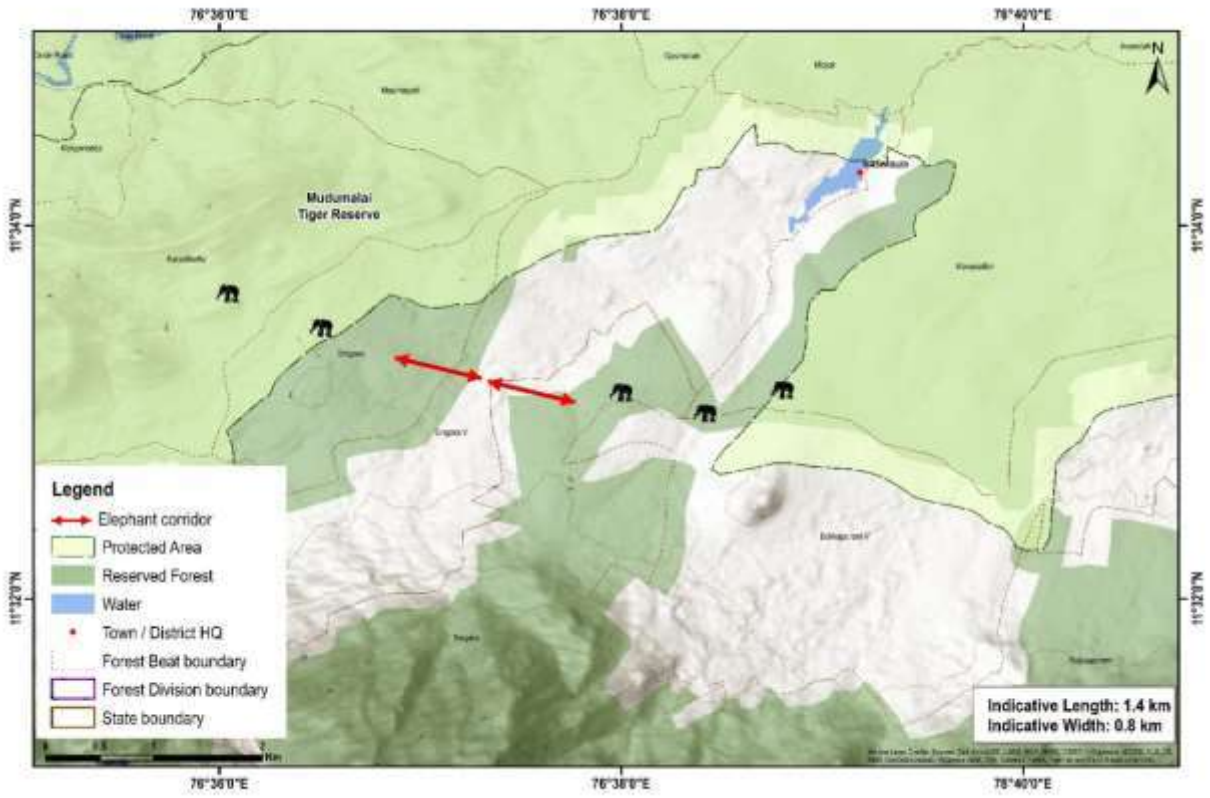
## 21. Avarahalla Sigur Corridor (Segur Corridor-2)

| | |
|---|---|
| **Connectivity** | **This corridor connects Avarahalla RF with Segur RF and is part of the Segur corridor with an extent of 3413.73 hectares covering four corridors declared as a Segur Plateau Elephant Corridor vide G.O.Ms No 125 E & F (FR.5) Dept Dated 31.08.2010** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 23.5 km, width = 1.5 km |
| **Geo Coordinates** | 1) N- 11.521750°, E- 76.53937° **2) N- 11.539190°, E- 76.64606°** 3) N- 11.523191°, E- 76.73430° 4) N- 11.559855°, E- 76.68879° |
| **Forest ranges falling within corridor** | Segur, Singara and Masinagudi Ranges |
| **Revenue villages falling within corridor** | 8 |
| **Ecological importance** | Segur corridors are critical in facilitating elephant movement in the larger Mudumalai – Bandipur – Wayanand – Sathyamangalam complex of Western Ghats |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forest = 61,392 ha, Agriculture = 1,193 ha, Habitation = 195.40 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 61 (for the entire series of 4 Segur corridors as estimated by the forest department during the year 2023) |
| **Major bottleneck** | Habitations at Mavanallah, Bokkapuram and flume channel running across the Corridor from Masinagudi to Moyar |
| **Linear infrastructure in the corridor** | 1) State Highway (Stretch I- 4.77 km, Stretch II- 1.71 km) and associated high traffic<br>2) 7 km of concrete flume hannel that runs from Masinagudi to Moyar<br>3) 2.09 km of Northern Hay and 3.27 km of Singara HT power lines<br>4) Establishments like schools, settlement, resorts and tourism infrastructure |
| **Recommendations by the forest department to improve the corridor** | 1) Acquiring land at crucial bottle neck points.<br>2) Reengineering of canal and flume channel to facilitate wildlife movement<br>3) Regulation of tourism activities. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



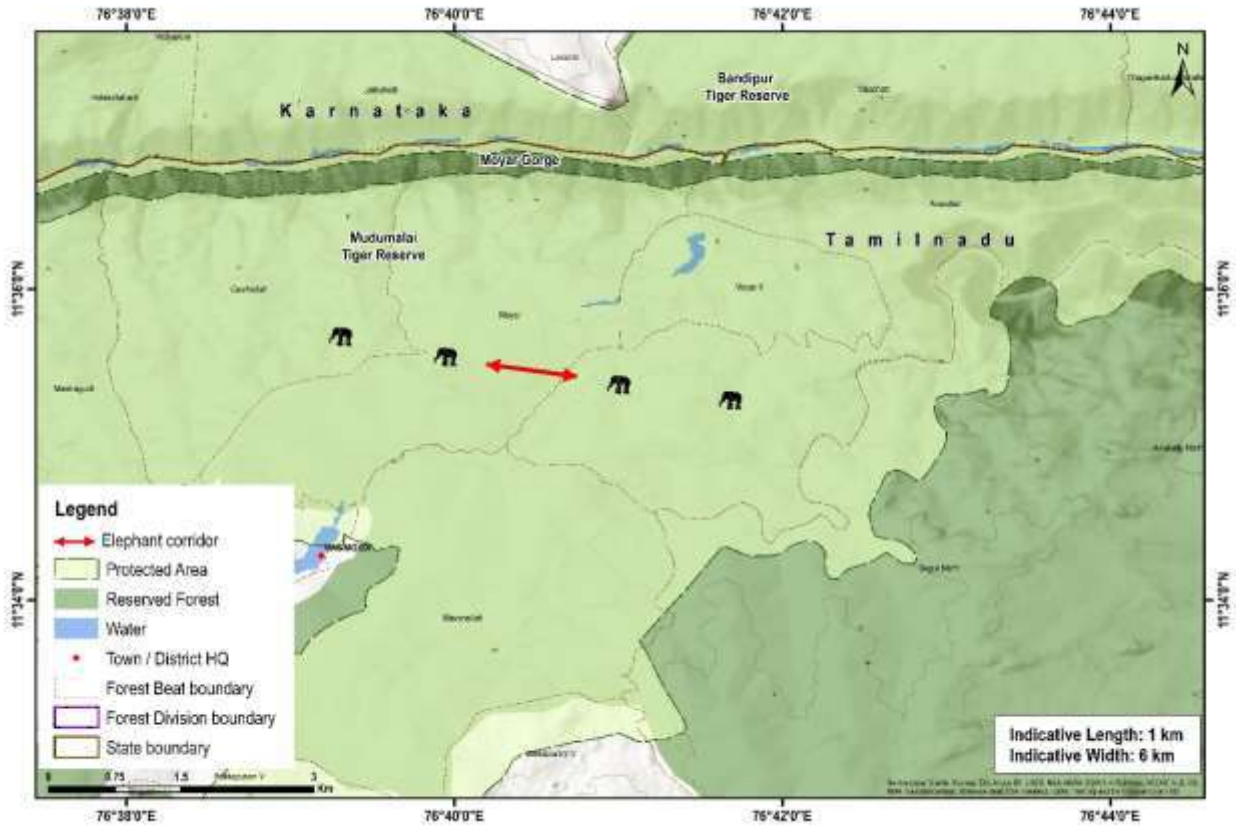
## 22. Kalmalai-Avarahalla-Singhara Corridor (Segur Corridor-3)

| | |
|---|---|
| **Connectivity** | **This corridor connects Kalmalai RF with Singara RF and Avarahalla RF, and is part of the Segur corridor with an extent of 3413.73 hectares covering four corridors declared as a Segur Plateau Elephant Corridor vide G.O.Ms No 125 E & F (FR.5) Dept Dated 31.08.2010** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 23.5 km, width = 1.5 km |
| **Geo Coordinates** | 1) N- 11.521750°, E- 76.53937° 2) N- 11.539190°, E- 76.64606° **3) N- 11.523191°, E- 76.73430°** 4) N- 11.559855°, E- 76.68879° |
| **Forest ranges falling within corridor** | Segur, Singara and Masinagudi Ranges |
| **Revenue villages falling within corridor** | 8 |
| **Ecological importance** | Segur corridors are critical in facilitating elephant movement in the larger Mudumalai – Bandipur – Wayanand – Sathyamangalam complex of Western Ghats |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forest = 61,392 ha, Agriculture = 1,193 ha, Habitation = 195.40 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 61 (for the entire series of 4 Segur corridors as estimated by the forest department during the year 2023) |
| **Major bottleneck** | Habitations at Mavanallah, Bokkapuram and flume channel running across the corridor from Masinagudi to Moyar |
| **Linear infrastructure in the corridor** | 1) State Highway (Stretch I- 4.77 km, Stretch II- 1.71 km) and associated high traffic<br>2) 7 km of concrete flume hannel that runs from Masinagudi to Moyar<br>3) 2.09 km of Northern Hay and 3.27 km of Singara HT power lines<br>4) Establishments like schools, settlement, resorts and tourism infrastructure |
| **Recommendations by the forest department to improve the corridor** | 1) Acquiring land at crucial bottle neck points.<br>2) Reengineering of canal and flume channel to facilitate wildlife movement<br>3) Regulation of tourism activities. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



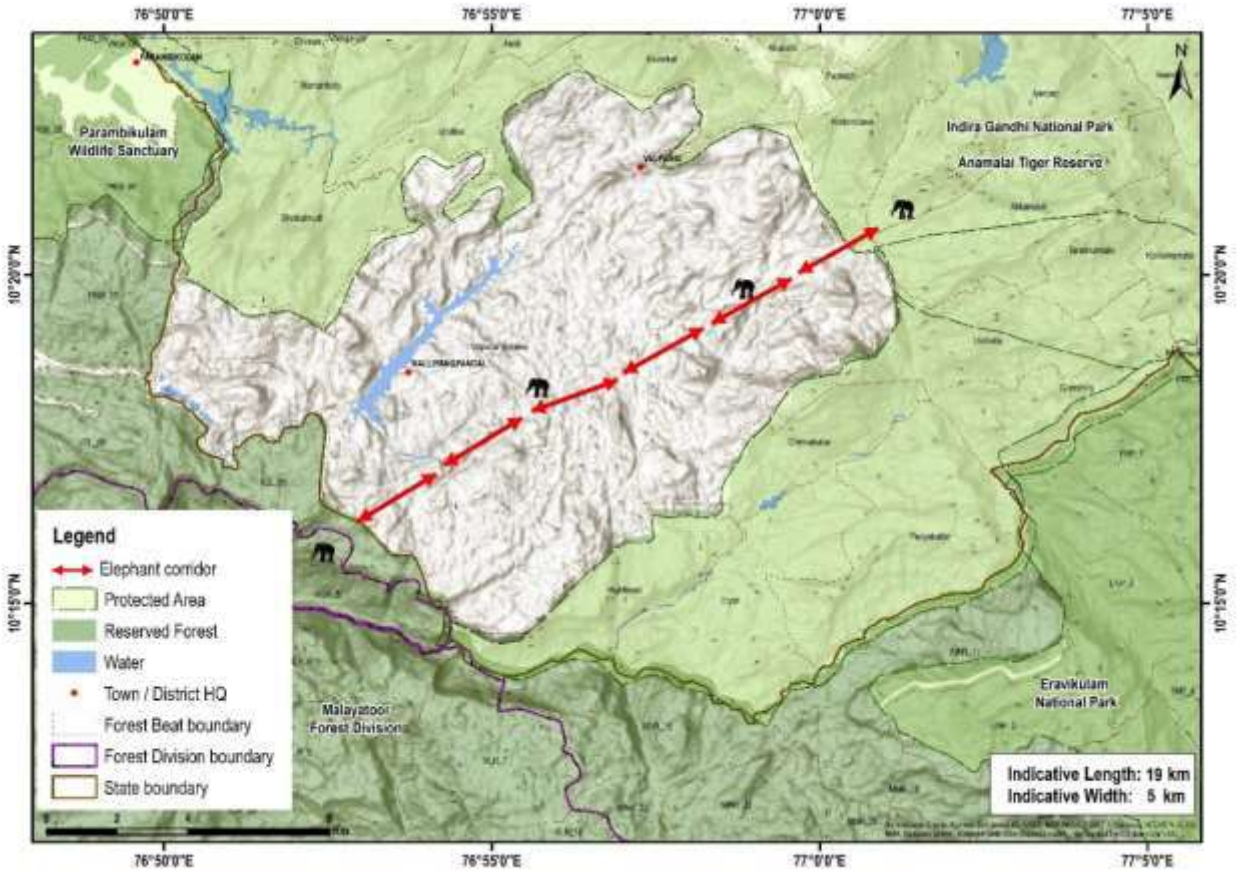
## 23. Moyar Avarahalla Corridor (Segur Corridor-4)

| | |
|---|---|
| **Connectivity** | **This corridor connects Moyar RF with Avarahalla RF and is part of the Segur corridor with an extent of 3413.73 hectares covering four corridors declared as a Segur Plateau Elephant Corridor vide G.O.Ms No 125 E & F (FR.5) Dept Dated 31.08.2010** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 23.5 km, width = 1.5 km |
| **Geo Coordinates** | 1) N- 11.521750°, E- 76.53937° 2) N- 11.539190°, E- 76.64606° 3) N- 11.523191°, E- 76.73430° **4) N- 11.559855°, E- 76.68879°** |
| **Forest ranges falling within corridor** | Segur, Singara and Masinagudi Ranges |
| **Revenue villages falling within corridor** | 8 |
| **Ecological importance** | Segur corridors are critical in facilitating elephant movement in the larger Mudumalai – Bandipur – Wayanand – Sathyamangalam complex of Western Ghats |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forest = 61,392 ha, Agriculture = 1,193 ha, Habitation = 195.40 ha |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 61 (for the entire series of 4 Segur corridors as estimated by the forest department during the year 2023) |
| **Major bottleneck** | Habitations at Mavanallah, Bokkapuram and flume channel running across the Corridor from Masinagudi to Moyar |
| **Linear infrastructure in the corridor** | 1) State Highway (Stretch I- 4.77 km, Stretch II- 1.71 km) and associated high traffic<br>2) 7 km of concrete flume hannel that runs from Masinagudi to Moyar<br>3) 2.09 km of Northern Hay and 3.27 km of Singara HT power lines<br>4) Establishments like schools, settlement, resorts and tourism infrastructure |
| **Recommendations by the forest department to improve the corridor** | 1) Acquiring land at crucial bottle neck points.<br>2) Reengineering of canal and flume channel to facilitate wildlife movement<br>3) Regulation of tourism activities. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



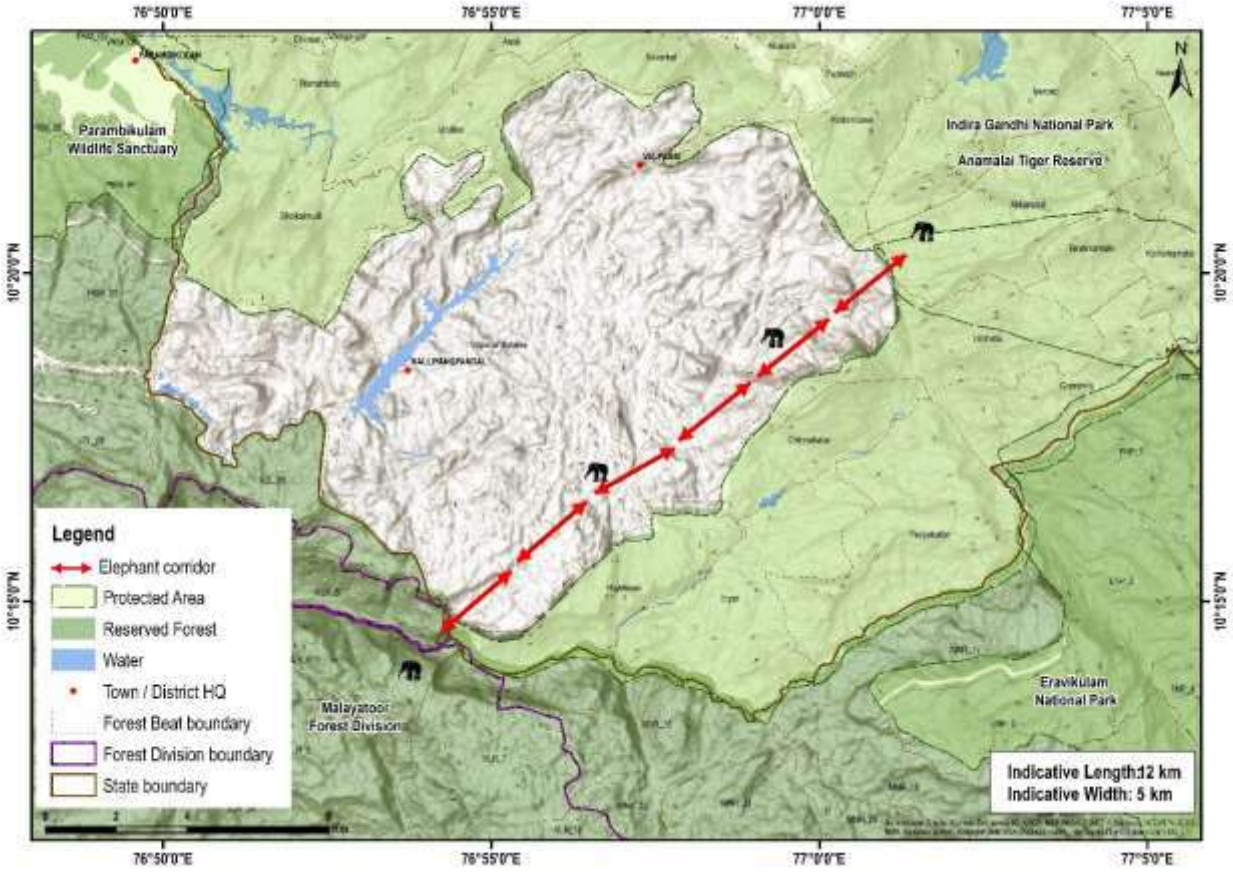
## 24. Sholayar Dam Corridor (Vazhachal – Anamalai via Sholayar)

| | |
|---|---|
| **Connectivity** | **This corridor links the habitats Kerala Reserve Forest boundary to Valparai Range of Anamalai Tiger Reserve** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 19 km, width = 5 km |
| **Geo Coordinates** | N 10°18'38.03" - E 76°52'3.48",<br>N 10°21'15.08" - E 76°59'39.20" |
| **Forest ranges falling within corridor** | Valparai Range |
| **Revenue villages falling within corridor** | 4 |
| **Ecological importance** | The connectivity between Malayattur Forest Division, Parambikulam Tiger Reserve of Kerala and Iyerpadi in Valparai of the Anamalai Tiger Reserve in Tamil Nadu is crucial for movement of elephants and other large animals including the tigers. |
| **Habitat type** | Evergreen Forest |
| **Major land use** | Forests, tea estates and PWD land |
| **Elephant movement status** | Regular, |
| **No. of elephants using the corridor** | Around 50 |
| **Major bottleneck** | Sholayar dam, tea estate and river |
| **Linear infrastructure in the corridor** | 1) Estate roads (20 km)<br>2) High tension power line- Sholayar I, II- 6 km and Urulikkal to Manambolly- 8 km<br>3) 15 Homestays and Resorts |
| **Recommendations by the forest department to improve the corridor** | Purchasing of land by the forest dept. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |



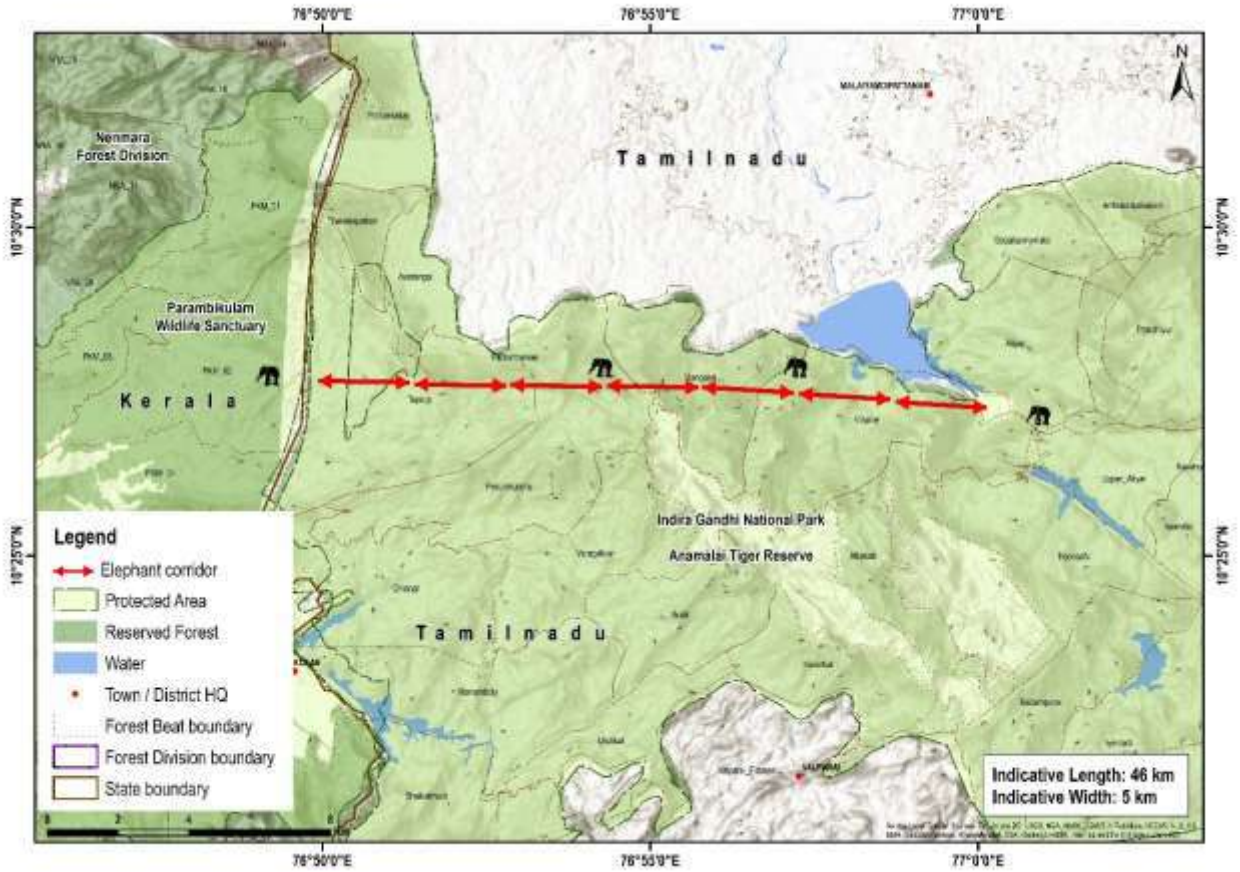
## 25. TANTEA Corridor (Vazhachal – Anaimalai via Ryan)

| Connectivity | This corridor links the Manamboly Range to Valparai Range |
|---|---|
| State | Tamil Nadu |
| Indicative length and width | Length = 12 km, width = 5 km |
| Geo Coordinates | N 10°16'9.89" - E 76°57'45.68",<br>N 10°17'18.77" - E 77°0'34.37" |
| Forest ranges falling within corridor | Valparai and Manamboly Range |
| Revenue villages falling within corridor | 4 |
| Ecological importance | The passage of Upasi to Chinnakallar is one of the most important pathways. This corridor acts as an important link connecting the protected areas of Tamil Nadu and Kerala, including Malayattur Forest Division. |
| Habitat type | Evergreen forest |
| Major land use | Forests and TANTEA leased land |
| Elephant movement status | Throughout the year, but high during certain seasons. |
| No. of elephants using the corridor | Around 50 elephants |
| Major bottleneck | 1) TANTEA tea factory, 200 labor quarters |
| Linear infrastructure in the corridor | 1) Estate roads (20 km)<br>2) High tension power line- Sholayar I, II- 6 km and Urulikkal to Manambolly- 8 km<br>3) 15 Homestays and Resorts |
| Recommendations by the forest department to improve the corridor | Leased areas in the corridor should be handed over to the Forest Department to maintain the integrity of the corridor. |
| Current status of the corridor | Active. Intensity of use by elephants increased. |



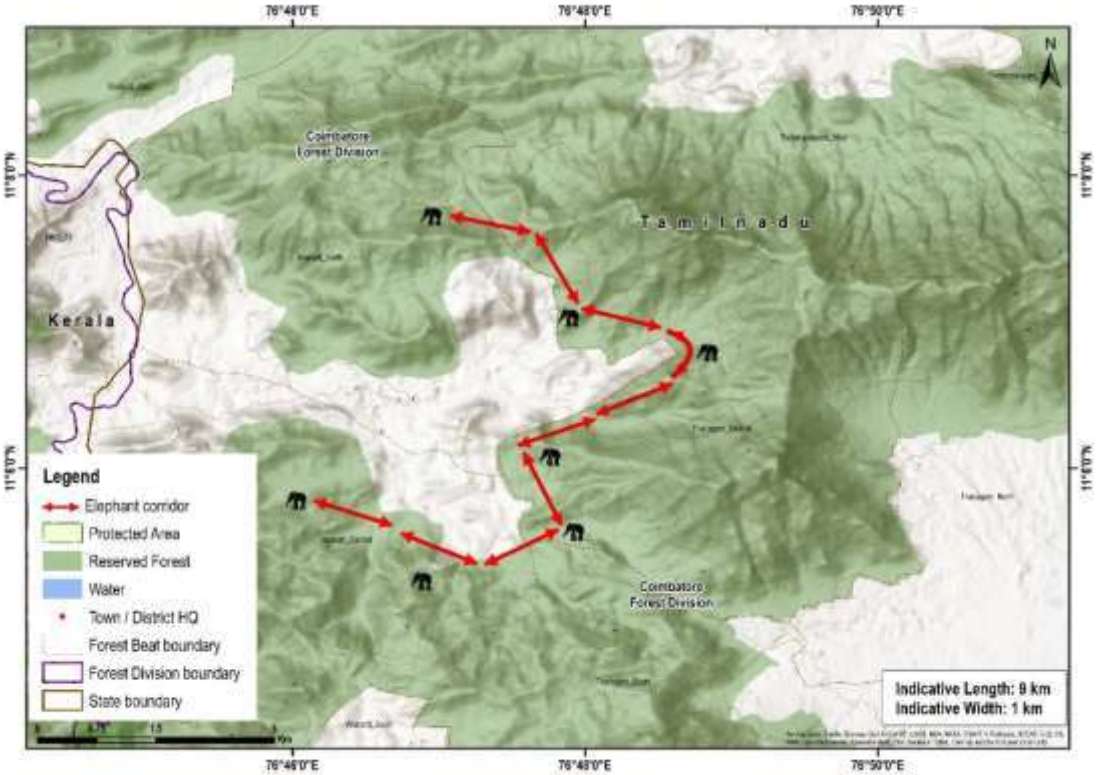
## 26. Topslip to Navamalai Corridor

| Connectivity | This corridor links the Ulandy Range to Pollachi Range |
|---|---|
| State | Tamil Nadu |
| Indicative length and width | Length = 46 km, width = 5 km |
| Geo Coordinates | N 10°27'39.85" - E 76°49'47.88",<br>N 10°27'13.22" - E 77°0'29.79" |
| Forest ranges falling within corridor | Ulandy and Pollachi Ranges |
| Revenue villages falling within corridor | 8 |
| Ecological importance | The passage of Topslip to Navamalai acts as a crucial link connecting several contiguous protected areas of Anamalai Tiger Reserve Forest. |
| Habitat type | Evergreen and Dry deciduous forest |
| Major land use | Forests<br>PWD leased land (for PAP canal)<br>Revenue land of settlements and coconut farms (60. 70 ha) |
| Elephant movement status | Regular |
| No. of elephants using the corridor | 48 |
| Major bottleneck | Highway road, Parambikulam-Aliyar contour canal |
| Linear infrastructure in the corridor | 1) Around 10 km of State Highway (Aliyar – Valparai)<br>2) PAP Canal with concrete embankment, 15 km<br>3) Hanging fences around the patta land<br>4) Farm house in Navamalai area<br>5) Maitreyi Vedic village and Aliyar Arivuthirukovil |
| Recommendations by the forest department to improve the corridor | Purchasing of some of the revenue land by the forest dept. |
| Current status of the corridor | Active. Intensity of use by elephants increased. |



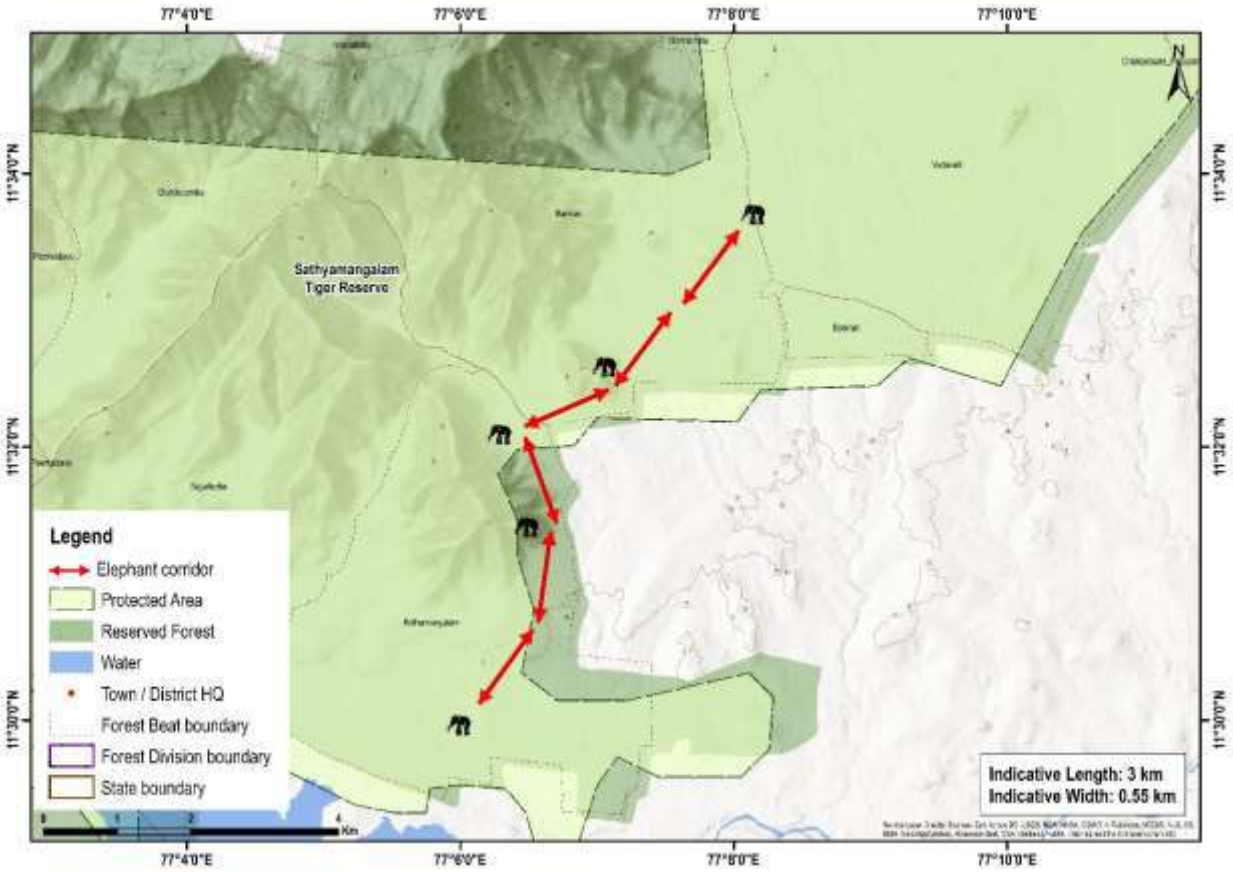
## 27. Anaikatti North- Anaikatti South Corridor

| Connectivity | This corridor connects Anakatti North Reserve Forest to Anakatti South Reserve Forest |
|---|---|
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 9 km, Width = 1 km |
| **Geo Coordinates** | 11.0856° N, 76.7750° E<br>11.1328° N, 76.8164° E |
| **Forest ranges falling within corridor** | Coimbatore and Periyanakanpalayam Ranges of Coimbatore Forest Division |
| **Revenue villages falling within corridor** | 0 |
| **Ecological importance** | Facilitates elephant movement from Mannarkad Forest Division of Kerala into undulating terrain of Coimbatore Forest Division which is functionally connected landscape with Sathymangalam Tiger Reserve. |
| **Habitat type** | Tropical thorn and deciduous forest. |
| **Major land use** | Forest (8 sq.km), Agriculture, settlements, Institutions, holiday homes, resorts, brick kiln industries, revenue lands and roads. Except 74.6 acres of land that has been individual to secure the corridor, the rest of it is under Reserve Forest. |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | NA |
| **Major bottleneck** | SACON entrance, Kandivazhi tribal settlement and Panapally village |
| **Linear infrastructure in the corridor** | 1) Coimbatore - Anaikatti State Highway, 3.9 km<br>2) Brick klins<br>3) Establishments like Salim Ali Center for Ornithology and Natural History, Karl Kubel Institute, PSG Institution and Swami Dayanand Saraswati Ashram, and numerous resorts along the forest fringes. |
| **Recommendations by the forest department to improve the corridor** | 1) About 25.7 acres of private land and 48.94 acres of revenue lands (identified in the Right of passage book by Wildlife Trust of India) have to be acquired to increase the width of the elephant corridor<br>2) The landscape section between Anaikatti Reserve Forest and Gopanari reserve Forest with a width of about 1km between Melbavivillage and Gopanari villages through which a road passes connectingVelliangadu and Anaikatti has to be included as corridor.<br>3) Proposing a new corridor named “Bolampatti Block 2 and Bolampatti Block 3” near the area Vallkarudu at the juncture of Devarayapuram and Vellimalai Pattinam revenue villages. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



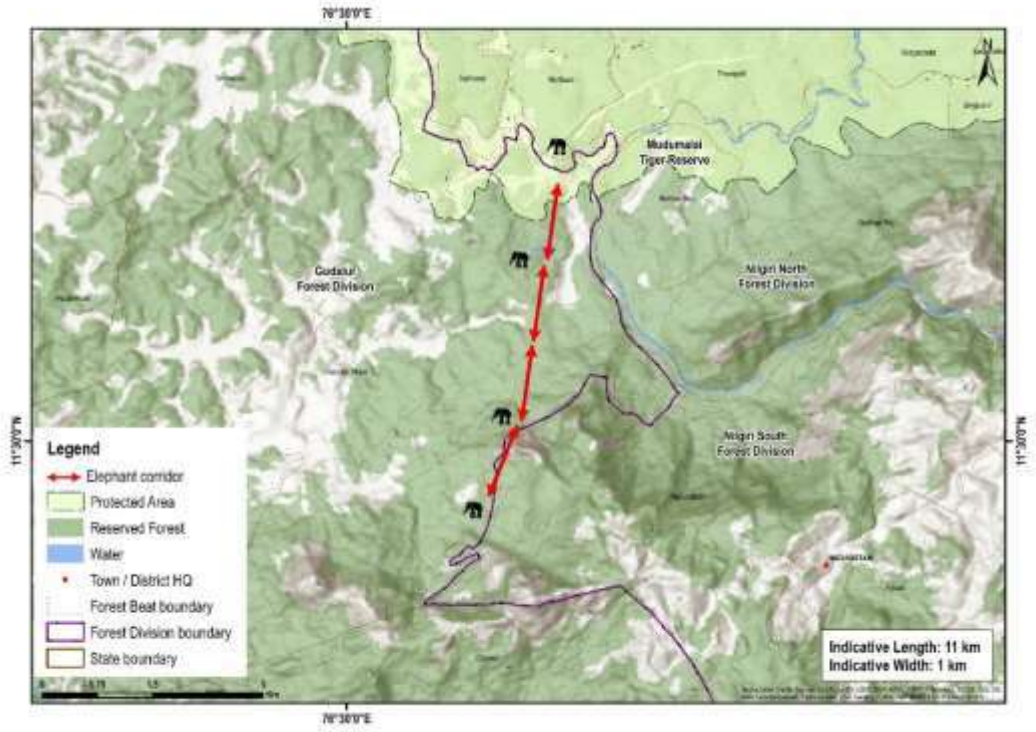
## 28. Talamalai – Guthiyalathur Corridor

| | |
|---|---|
| **Connectivity** | **This corridor connects Talamalai Reserve Forest (in the upper plateau) to the Guthiyalathur Reserve Forest (in the lower plateau) located near 1st bend of the National Highway 209 from Bannari to Chamrajnagar.** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 3 km, width = 0.5 km |
| **Geo Coordinates** | N 11°30'31" - E 77°5'4"<br>N 11°33'37" - E 77°8'26" |
| **Forest ranges falling within corridor** | Sathyamangalam, Bhavani Sagar, and Talamalai Ranges |
| **Ecological importance** | This is a very important corridor used by large number of elephants and other wildlife including tigers (*Panthera tigris*). The corridor is located along the foothills of the Talamalai hills, where the habitat is narrow and surrounded by agricultural areas. Elephant movement from Bhavanisagar range into Sathyamangalam range is particularly facilitated by this corridor. |
| **Habitat type** | Tropical thorn and deciduous forest |
| **Major land use** | Forest |
| **Elephant movement status** | Regular, movement is high during October to December |
| **No. of elephants using the corridor** | Around 770 elephants occur in the park and many of them use this corridor |
| **Major bottleneck** | The shooting range of STF near Puthubeerkadavu and few resorts and ashrams located near the forest boundary. |
| **Linear infrastructure in the corridor** | Sathyamangalam Chamrajnagar National Highway (NH 209) |
| **Recommendations by the forest department to improve the corridor** | Taking over the ashram land near Puthubeerkadavu and increasing the width of the natural habitats. |
| **Current status of the corridor** | Active. Intensity of use by elephants stable. |



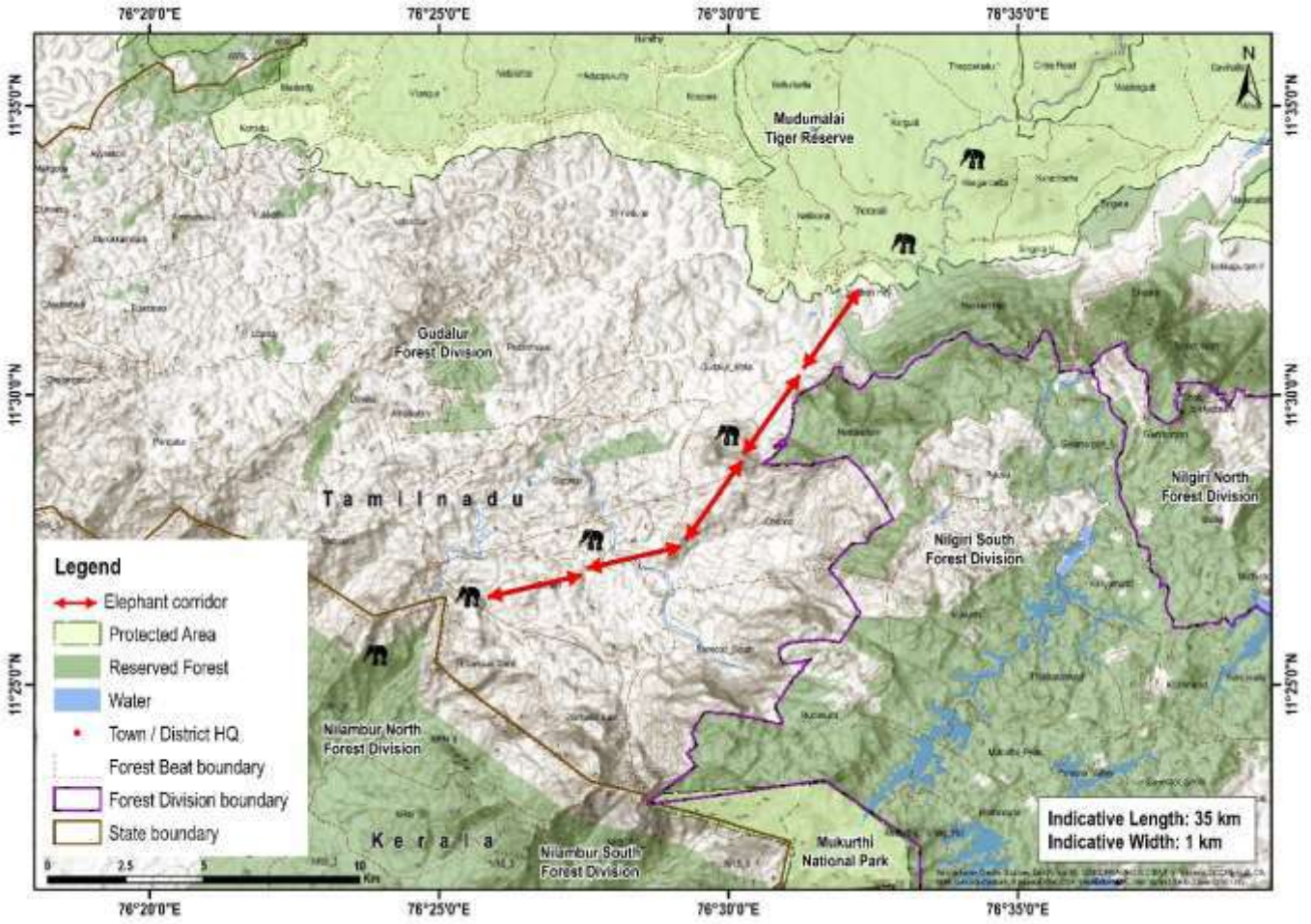
## 29. Mudumalai - Mukuruthi Corridor

| Connectivity | This corridor connects Mudumalai Tiger Reserve to Mukuruthi National Park |
|---|---|
| State | Tamil Nadu |
| Indicative length and width | Length = 11 km, width = 1 km |
| Geo Coordinates | 76 31'31.07 E, 11 31' 3204 N<br>76 30' 5973 E, 11 29' 34.25 N |
| Forest ranges falling within corridor | Gudalur, Naduvattam and Northern Hay Ranges |
| Revenue villages falling within corridor | 7 |
| Ecological importance | This corridor connects Mudumalai Tiger Reserve and Mukurthi National Park providing permeability for elephants to move from dry thorn and dry deciduous habitats to evergreen and *shola* habitats of the upper Nilgiris. |
| Habitat type | Moist deciduous, Semi-evergreen, Shola and Grasslands and Monoculture plantations. |
| Major land use | Forest and associated natural habitats, tea and coffee plantation and human settlements. |
| Elephant movement status | Seasonal, movement is high in months of August to November. |
| No. of elephants using the corridor | 60- 80 |
| Major bottleneck | 1) In lower elevation Deivamalai village and the Silver Cloud estate.<br>2) In between upper elevation (TANTEA) and lower elevation (Silver cloud estate) only 300 m length of forests are available.<br>3) In upper elevation only 200m forest area is available between Royal valley and Outcherlony estates.<br>4) National Highway 67, Silver cloud tea factory. |
| Linear infrastructure in the corridor | 1) National Highway 67 and associated high traffic<br>2) State Highway (Gundalpet - Coimbatore).<br>3) 40 km of High tension power line (11,000 KV) |
| Recommendations by the forest department to improve the corridor | 1) Immediate taking over possession of the large tract of Janmam lands from the plantations, whose lease period has expired long back and notifying these private lands as Reserved Forests for corridor protection in Gudalur Division.<br>2) Regulation for land use and land cover changes in private lands also needed.<br>3) Schools and Colleges which are located in the peripheral areas should be targeted for awareness education<br>4) Corridor needs to be notified to check the rapid developments in the corridor.<br>5) The corridor is newly identified; hence need more detailed study/ground truth information in future for more scientific information. |
| Current status of the corridor | Active. Intensity of use by elephants stable. |



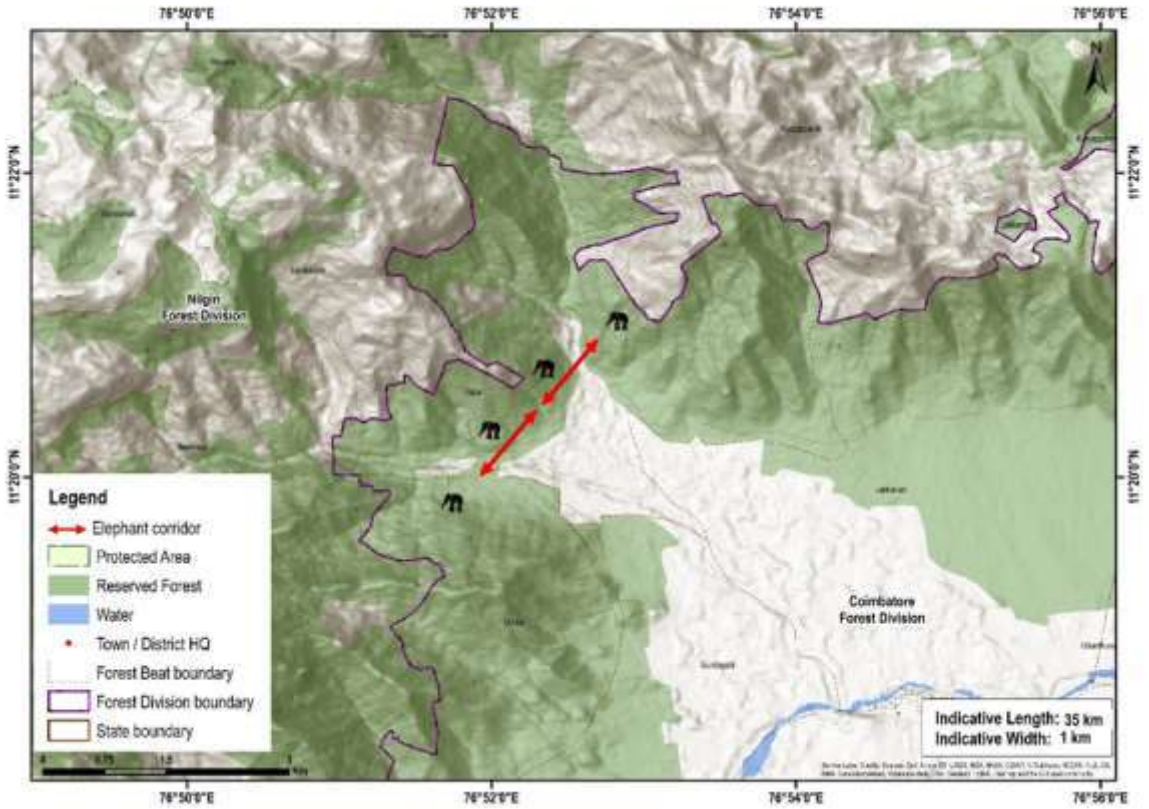
## 30. Mudumalai- Nilambur via O' Valley Corridor (Interstate corridor)

| | |
|---|---|
| **Connectivity** | **This corridor connects Mudumalai Tiger Reserve of Tamil Nadu to Nilambur North Forest Division in Kerala via Gudalur Forest Division in Tamil Nadu.** |
| **State** | Tamil Nadu and Kerala |
| **Indicative length and width** | Length = 35 km, width = 1 km |
| **Geo Coordinates** | 76 31' 47.725 E, 11 32' 53.874 N<br>76 24' 34.841 E, 11 25' 30.235 N |
| **Forest ranges falling within corridor** | Gudalur, Naduvattam and O Valley Ranges |
| **Revenue villages falling within corridor** | 31 |
| **Ecological importance** | This corridor is the major connectivity between Mudumalai Tiger Reserve and Nilambur Forest Division elephant population. |
| **Habitat type** | Moist deciduous and semi-evergreen forests |
| **Major land use** | Forest = 5209 ha<br>Agriculture/estates = 3408 ha<br>Habitation = 1311 ha |
| **Elephant movement status** | Regular but peak during south west monsoon season |
| **No. of elephants using the corridor** | Around 60 |
| **Major bottleneck** | 1) National Highway 67<br>2) Silver cloud tea factory<br>3) 27th mile village<br>4) Labour lines of Manjushree Estate, O'Valley. |
| **Linear infrastructure in the corridor** | 1) National Highway 67 and associated high vehicular traffic<br>2) State Highway (Gundalpet - Coimbatore) and Gudalur to Nilambur via Nadugani, Manjeri and associated high vehicular traffic<br>3) High tension power line (11,000 Kv), 40 kms<br>4) Working Manjushree Factory (Smokehouse) at Guind, Silver cloud tea factory and Periyashola tea factory<br>5) Non-working factories like Bharathinagar Factory and Seaforth factory.<br>6) Government offices like Municipality and Panchayat offices, Police station |
| **Recommendations by the forest department to improve the corridor** | 1) Relocation of public from fragmented areas of O'Valley range through proper schemes.<br>2) Immediate taking over possession of the large tract of Janmam lands from the plantations, whose lease period has expired long back and notifying these private lands as Reserved Forests for corridor protection.<br>3) As a short-term remedy, Elephant Proof Trench (EPT) and other preventive methods can be resorted to this may provide some immediate relief.<br>4) Regulation for land use and land cover changes in private lands also needed.<br>5) Schools and Colleges which are located in the peripheral areas should be concentrated on for awareness education in order to develop green and animal lovers for future generations.<br>6) More importantly the corridor needs to be notified and should have guidelines to check the rapid developments in the corridor. |
| **Current status of the corridor** | Active. Intensity of use by elephants increased. |


76°20'0"E
76°25'0"E
76°30'0"E
76°35'0"E
11°35'0"N
11°30'0"N
11°25'0"N
N
Mudumalai
Tiger Reserve
Gudalur
Forest Division
Tamilnadu
Nilgiri North
Forest Division
Nilgiri South
Forest Division
Nilambur North
Forest Division
Nilambur South
Forest Division
Mukurthi
National Park
Kerala
Legend
Elephant corridor
Protected Area
Reserved Forest
Water
Town / District HQ
Forest Beat boundary
Forest Division boundary
State boundary
0 2.5 5 10
Km
Indicative Length: 35 km
Indicative Width: 1 km

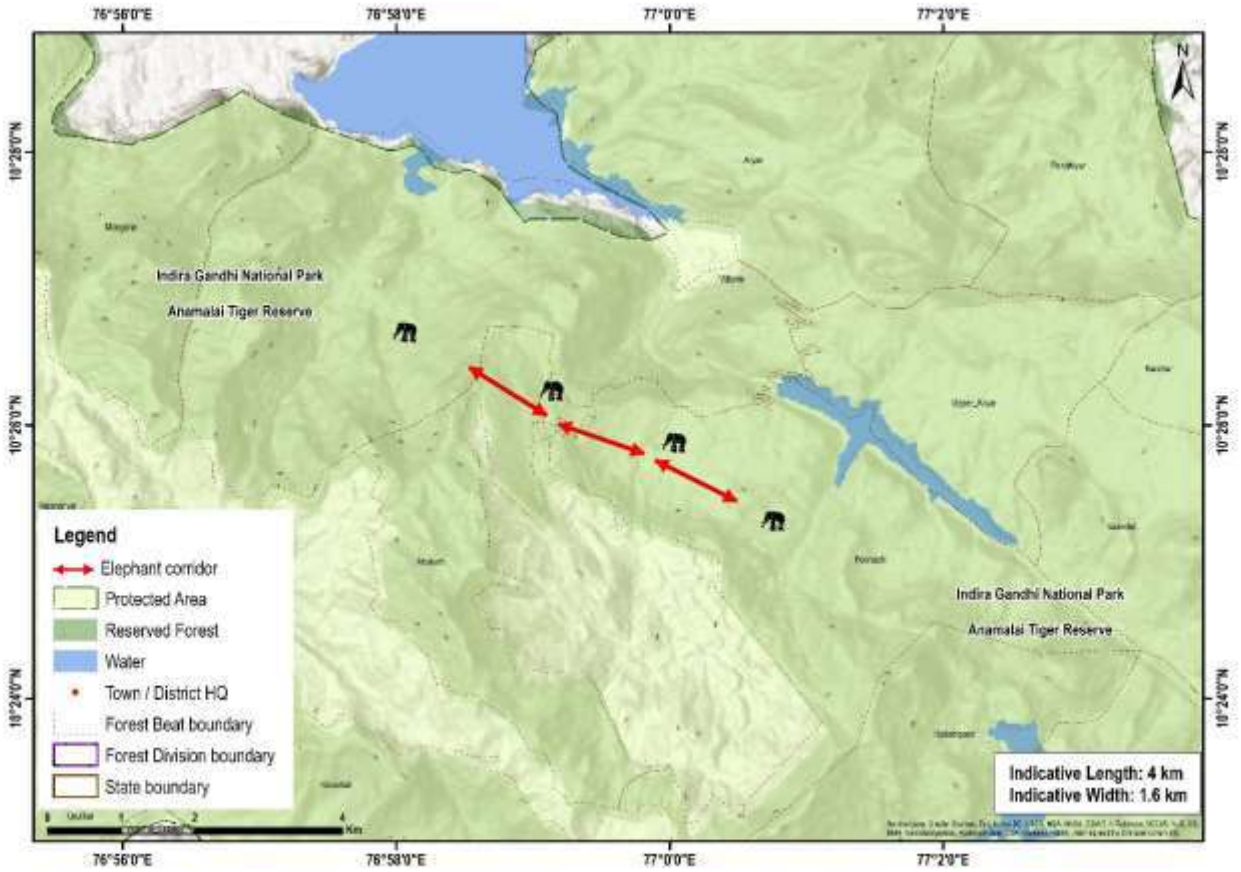
## 31. Jaccanaire Slope - Hulikal Durgam - Nellithurai – Koothamandi south (Kallar corridor)

| | |
|---|---|
| **Connectivity** | **Sathyamangalam Tiger Reserve and south of Coimbatore FD/ Attapadi (through Mettupalayam and Sirumugai Forest Ranges; Nellithurai, Nellimalai, Hulikal, Jacanare, Odanthurai reserve forests)** |
| **State** | Tamil Nadu |
| **Indicative length and width** | Length = 35 km, width = 1 km |
| **Geo Coordinates** | 11° 19' 30"- 11° 21' 26" N / 76° 50' 52"- 76° 54' 12" E |
| **Forest ranges falling within corridor** | Mettupalayam and Sirumugai Forest Ranges |
| **Revenue villages falling within corridor** | 6 |
| **Ecological importance** | It is the only link between Sathyamangalam Tiger Reserve and southern Coimbatore elephant populations. |
| **Habitat type** | Dry thorn, Dry and moist deciduous forest types |
| **Major land use** | Forests, Agricultural land, Settlemenst and River |
| **Elephant movement status** | Regular |
| **No. of elephants using the corridor** | 100- 150 |
| **Major bottleneck** | 1) Between Kallr first hairpin bend and Dhooripalam (Private lands),<br>2) Swamy Sachidananda Jyothi Niketan School,<br>3) Forest College and Research Institute,<br>4) Alur Vayal. |
| **Linear infrastructure in the corridor** | 1) National Highway 181, 5 km and State Highway – Mettupalayam to Kotagiri, 2 km 2) Mountain train track, 5 km; 3) High-tension power line; 4) Elephant Proof Trench along the forest boundary, 30 km; 5) FCRI fence and EPT, 6 km; 6) Kallar Horticultural Garden electric fence, 2 km; 7) Private lands erected electric fence., 27 km; 8) Compound wall by Black thunder and Sachidanandha school, 2.2 km |
| **Recommendations by the forest department to improve the corridor** | 1) Over pass have to be constructed in National Highway – 181 and State Highway (Mettupalayam – Kotagiri Road)<br>2) Acquisition of private lands to the south of NH - 181, between Forest check-post & First hairpin bend (app. 30 acres) or easement agreement with private land owners<br>3) Acquisition of private lands at Alur vayal or removal of power fences in the corridor or easement agreement with land owners.<br>4) Reduce the FCRI boundary by amending the lease agreement<br>5) Regulate the land use within the corridor area |
| **Current status of the corridor** | Active. Intensity of use by elephants not available |



## 32. Anamalai at Punachi Corridor

| Connectivity | Punachi Reserve Forest with Anaimalai Reserve Forest of Anaimalai Tiger Reserve |
|---|---|
| State | Tamil Nadu |
| Indicative length and width | Length = 4 km, width = 1.6 km |
| Geo Coordinates | 10° 25' 3"- 10° 26' 42" N<br>76° 58' 34"- 77° 0' 46" E |
| Forest ranges falling within corridor | Valparai |
| Revenue villages falling within corridor | 1 |
| Ecological importance | The corridor used to connect Punachi Reserve Forest and Anamalai Reserve Forest within Anamalai Tiger Reserve. |
| Habitat type | Tropical moist deciduous forest |
| Major land use | Forest |
| Elephant movement status | None |
| No. of elephants using the corridor | None |
| Linear infrastructure in the corridor | State Highway 78 and associated traffic |
| Conservation Recommendations by the forest department | 1) The corridor should be notified and legally protected by the state forest department under an appropriate law, and action should be taken to prevent developmental activities hindering elephant movement.<br>2. Vehicular speed should be regulated on the Valparai ghat road and visitors prevented from stopping. Suitable signage could also be placed to create awareness about the corridor and its importance |
| Status of the corridor | Impaired |



# Summary

As of 2023, through the collaborative efforts between the Project Elephant of the MoEFCC and the State Forest Departments of the elephant range states, a total of 150 elephant corridors had been ground-validated across 15 states in the four elephant-bearing regions across India. The region-specific and state-specific list of corridors have been included in Annexure-1 of the report. The State of West Bengal had the highest number of elephant corridors, with 26 identified in both northern West Bengal (part of the North-eastern regional elephant population) and southern West Bengal (part of the east-central regional elephant population).

In addition to the 15 elephant range states where elephant corridors have been identified and ground-validated as on 2023, there are also states in which elephants have recently expanded their ranges. This includes the Vidharba region in Maharashtra adjoining Chhattisgarh, southern Maharashtra adjoining Karnataka, Madhya Pradesh, where elephants presently occur in Bandhavgarh and Sanjay Tiger Reserves and northern Andhra Pradesh, where elephants move in from Odisha. In these states, long-term viability of habitats to support elephant populations, followed by data-driven approach in identifying corridors would be pertinent. Similarly, data on elephant movement remains sketchy in many north eastern states that harbour relatively small population of elephants. It is hoped that through the collaborative efforts of the State Forest Departments and Project Elephant in the coming years so that the status of corridors can become clear in these areas.

**Region-wise corridors**

Among the four elephant bearing regions, the East-Central region has reported the highest number of elephant corridors (n = 52) followed by North-east region (n = 48), and Southern region (n = 32). The Northern region had the least number of elephant corridors (n = 18) (Figure-1).

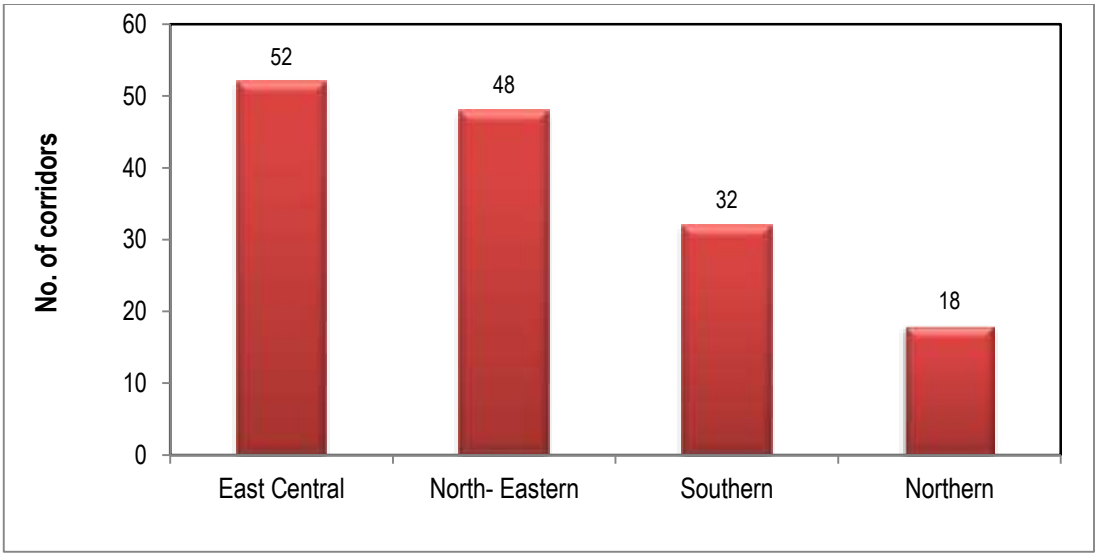



**Figure-1. Region-wise elephant corridors across India**

**Within state, interstate and transnational elephant corridors**

Among the 150 reported elephant corridors in India, 126 occurred within the political boundary of a State. Nineteen corridors were located across two states. There were six transnational corridors between India and Nepal, majorly in the State of Uttar Pradesh (Figure-2).

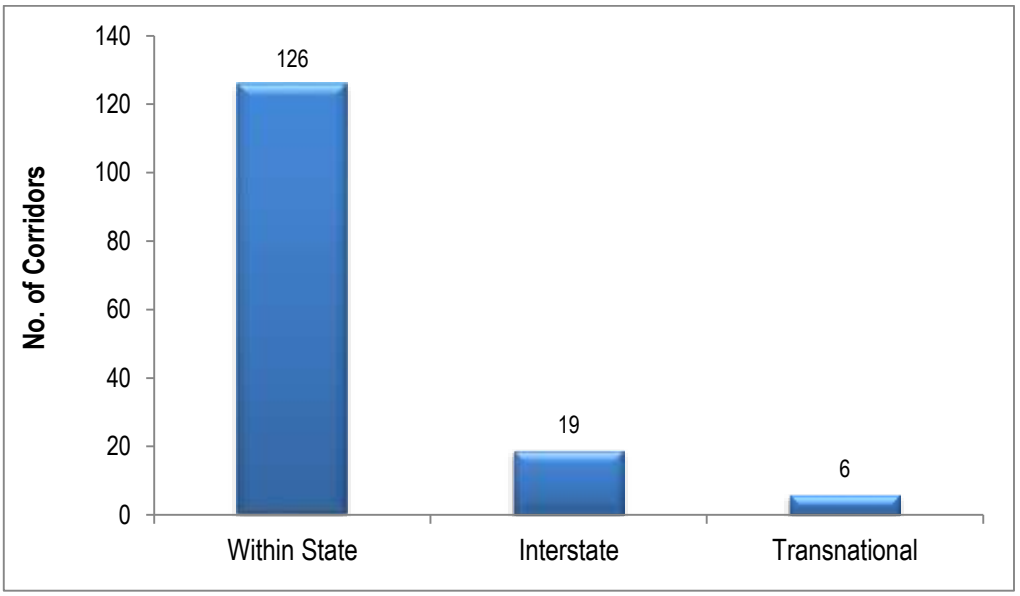



**Figure-2. Within state, interstate and transnational elephant corridors across India**

**Current status of corridors**

Of the 150 elephant corridors that were reported in India as on 2023, in 40% (n = 59) of elephant corridors, the intensity of use by elephants has reportedly increased (Figure-3). In 19% (n = 29) of elephant corridors, the intensity of use by elephants had remained stable over time. In another 19% (n = 29) of elephant corridors, the intensity of use by elephants had decreased. A total of 15 elephant corridors have been impaired and would require restoration efforts to render the corridors functional. For 18 corridors, information on the current use by elephants was not available (Figure-3).

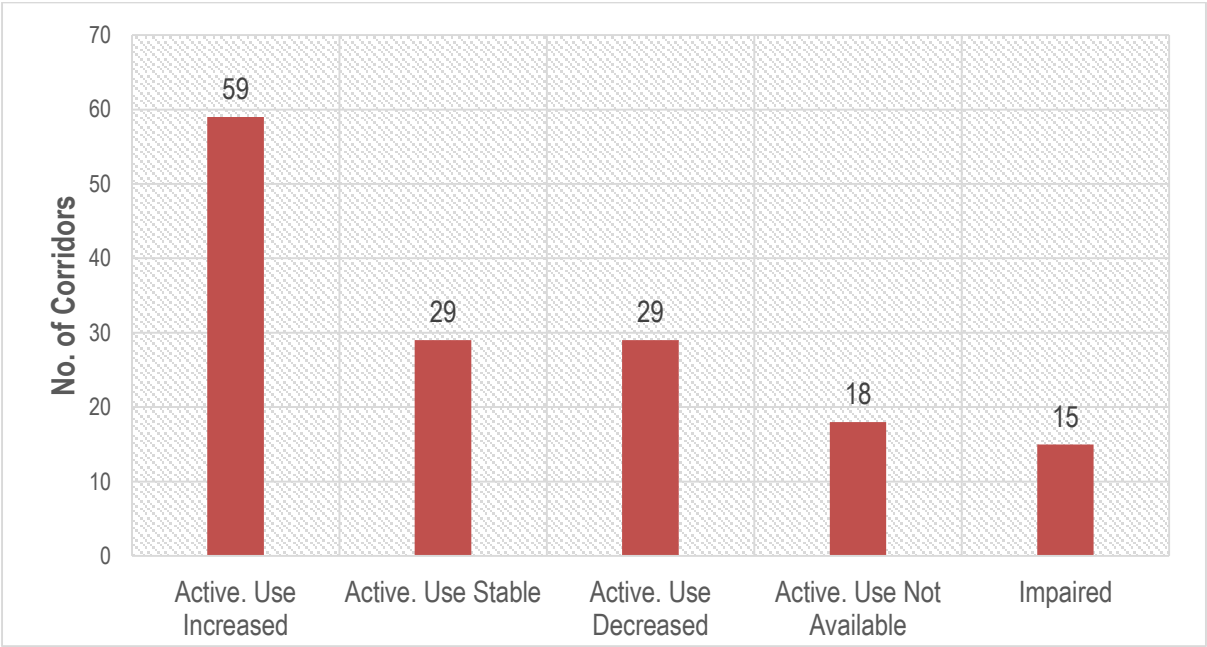



**Figure-3. The current status of elephant corridors across India**

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*Annexure – I*

**List of Elephant Corridors**

| S No | Elephant Corridor | Region | States | Type |
|---|---|---|---|---|
| 1 | Basanta | Northern | Uttar Pradesh | Transnational |
| 2 | Laljhadi | | Uttar Pradesh | Transnational |
| 3 | Chhedia | | Uttar Pradesh | Transnational |
| 4 | Dudhwa-Katarniaghat | | Uttar Pradesh | Within State |
| 5 | Khata | | Uttar Pradesh | Transnational |
| 6 | Laggabagga-Tatarganj-Shukhlaphanta | | Uttar Pradesh | Transnational |
| 7 | Shiwalik | | Uttar Pradesh | Interstate |
| 8 | Rawasan-Sonanadi via Bijnor | | Uttarakhand and Uttar Pradesh | Interstate |
| 9 | Kansrau – Barkote | | Uttarakhand | Within State |
| 10 | Motichur – Barkote (Teenpani) | | Uttarakhand | Within State |
| 11 | Motichur – Gohri | | Uttarakhand | Within State |
| 12 | Chilla – Motichur | | Uttarakhand | Within State |
| 13 | Rawasan – Sonanadhi (Upper arm) | | Uttarakhand | Within State |
| 14 | Malani – Kota: Kosi | | Uttarakhand | Within State |
| 15 | Chilkiya – Kota: Kosi near Sundarkhal | | Uttarakhand | Within State |
| 16 | Fatehpur – Gadgadia (Nihal – Bhakra) | | Uttarakhand | Within State |
| 17 | Kilpura – Khatima | | Uttarakhand and Uttar Pradesh | Interstate and Transnational |
| 18 | Gorai Tanda (Gola) | | Uttarakhand | Within State |
| 19 | Pakke-Doimara at Dedzelling | North-Eastern | Arunachal Pradesh | Within State |
| 20 | Dulung- Subansiri | | Arunachal Pradesh | Within State |
| 21 | Dering- Mebo (Sigar nalla) | | Arunachal Pradesh | Within State |
| 22 | Pakke- Papum at Langka nalla | | Arunachal Pradesh | Within State |
| 23 | Pakke- papum at Seijosa nalla | | Arunachal Pradesh | Within State |
| 24 | Pakke doimara at Tippi | | Arunachal Pradesh | Within State |
| 25 | Durpong-Doimukh at Khundakhuwa | | Arunachal Pradesh | Within State |
| 26 | D'ering - Mebo at Kongkul | | Arunachal Pradesh | Within State |
| 27 | Deosur | | Assam | Within State |
| 28 | Bogapani - Upper Dihing East- Upper Dihing West Block | | Assam | Within State |
| 29 | Panbari | | Assam | Within State |
| 30 | Kotha Buridehing | | Assam | Within State |
| 31 | Kanchanjuri | | Assam | Within State |
| 32 | Hatidandi | | Assam | Within State |
| 33 | Haldhibari | | Assam | Within State |
| 34 | Golai- Pawai - Upper Dihing East- Upper Dihing West Block | | Assam | Within State |
| 35 | Kukurakata-Bagser at Amguri | | Assam | Within State |
| 36 | Singri Hill | | Assam | Within State |
| 37 | D'ering- Dibru Saikhowa | | Assam and Arunachal Pradesh | Interstate |

| S No | Elephant Corridor | Region | States | Type |
|---|---|---|---|---|
| 38 | Kalapahar- Doigrung | North-Eastern | Assam and Arunachal Pradesh | Interstate |
| 39 | Rewak- Emangre | | Meghalaya | Within State |
| 40 | Nokrek- Emangre | | Meghalaya | Within State |
| 41 | Siju- Rewak | | Meghalaya | Within State |
| 42 | Balpakram- Baghmara | | Meghalaya | Within State |
| 43 | Ranggira- Nokrek | | Meghalaya | Within State |
| 44 | Saipung- Narpuh | | Meghalaya | Within State |
| 45 | Geleki- Sitap | | Nagaland | Within State |
| 46 | Abhaypur- Singphan | | Nagaland | Within State |
| 47 | Hollongapar- Longtho | | Nagaland | Within State |
| 48 | Daldali- Dimapur | | Nagaland | Within State |
| 49 | Geleki- Tuli | | Nagaland | Within State |
| 50 | Desoi- Changdang | | Nagaland | Within State |
| 51 | Tirutilip- Longchem | | Nagaland | Within State |
| 52 | Titi- Dumchi - Reti | | West Bengal | Within State |
| 53 | Titi- Reti | | West Bengal | Within State |
| 54 | Apalchand- Mahananda | | West Bengal | Within State |
| 55 | Apalchand- Gorumara | | West Bengal | Within State |
| 56 | Apalchand- Klimpong at Mal block (via Meenglass) | | West Bengal | Within State |
| 57 | Apalchand- Klimpong at Mal block (via Sylee) | | West Bengal | Within State |
| 58 | Nimati- Chilpata (Buxa- Chilpata) | | West Bengal | Within State |
| 59 | Buxa- Titi (via Beech and Bharnobari Tea Garden) | | West Bengal | Within State |
| 60 | Buxa- Titi (via Torsha) | | West Bengal | Within State |
| 61 | Buxa- Ripu at Sankosh | | West Bengal | Within State |
| 62 | Mahananda- Kolabari- Tukriajhar | | West Bengal | Within State |
| 63 | Chapramari - Kalimpong | | West Bengal | Within State |
| 64 | Moraghat–Central Daina | | West Bengal | Within State |
| 65 | Reti–Central Daina | | West Bengal | Within State |
| 66 | Moraghat- Reti | | West Bengal | Within State |
| 67 | Jamui- Jhajha- Chakayi | East-central | Bihar | Within State |
| 68 | Charmar- jingol | | Chhattisgarh | Within State |
| 69 | Nagdhara-Baraud | | Chhattisgarh | Within State |
| 70 | Hati-Kudmura | | Chhattisgarh | Within State |
| 71 | Chaal - Kartala | | Chhattisgarh | Within State |
| 72 | Korondha - Rupunga | | Chhattisgarh | Within State |
| 73 | Balco-Etma Nagar | | Chhattisgarh | Within State |
| 74 | Balco-Katghora | | Chhattisgarh | Within State |
| 75 | Khod-Rihand | | Chhattisgarh | Within State |
| 76 | Ghat Pendari-Pakni | | Chhattisgarh | Within State |
| 77 | Bhagabilla- Ratnasai | | Jharkhand | Within State |
| 78 | Jampani- Bhagabilla | | Jharkhand | Within State |

| S No | Elephant Corridor | Region | States | Type |
|---|---|---|---|---|
| 79 | Sangajata- Haldipokhar | East-central | Jharkhand | Within State |
| 80 | Lepang- Dumuria | | Jharkhand | Within State |
| 81 | Ankua- Ambia | | Jharkhand | Within State |
| 82 | Raibera- Pulbaburu | | Jharkhand | Within State |
| 83 | Dalapani - Suklara | | Jharkhand | Within State |
| 84 | Dalma – Chandil | | Jharkhand | Within State |
| 85 | Dumariya - Nayagram | | Jharkhand | Within State |
| 86 | Silli - Angara | | Jharkhand | Within State |
| 87 | Bharno – Bero - Kara / Sisai- Karra | | Jharkhand | Within State |
| 88 | Dalma- Asanbani | | Jharkhand | Within State |
| 89 | Dalma - Rugai | | Jharkhand | Within State |
| 90 | Siyaljora - Dhobadhobin | | Jharkhand | Within State |
| 91 | Dalapani - Kankrajhor | | Jharkhand and West Bengal | Interstate |
| 92 | Anjadbera-Bichaburu | | Jharkhand | Within State |
| 93 | Dumriya-Kundaluka and Murakanjia | | Jharkhand | Within State |
| 94 | Telkoi - Pallahada | | Odisha | Within State |
| 95 | Karo - Karampada | | Odisha | Interstate |
| 96 | Deuli - Suliapada | | Odisha and West Bengal | Interstate |
| 97 | Similipal - Hadagarh - Kuldiha (Simlipal- Satkosia) (Baula- kuldiha) | | Odisha | Within State |
| 98 | Maulabhanja - Jiridamali - Anantapur | | Odisha | Within State |
| 99 | Kanheijena - Anantapur | | Odisha | Within State |
| 100 | Nuagaon - Baruni | | Odisha | Within State |
| 101 | Buguda - Central RF | | Odisha | Within State |
| 102 | Tal - Kholgarh | | Odisha | Within State |
| 103 | Barapahad - Tarva - Kantamal | | Odisha | Within State |
| 104 | Kotagarh - Chandrapur | | Odisha | Within State |
| 105 | Karlapat - Urladani | | Odisha | Within State |
| 106 | Badampahar - Dhobadhobin | | Odisha and Jharkhand | Interstate |
| 107 | Badampahar - Karida East | | Odisha | Interstate |
| 108 | Kalikunda-Chandra through Manikpara | | West Bengal | Within State |
| 109 | Nayagram-- Jamboni through keshorrekha | | West Bengal | Within State |
| 110 | Chandabila Tapoban- Dhumsi through Keshorrekha | | West Bengal | Within State |
| 111 | Kalaikunda- Chandra through Satpadi ghat | | West Bengal | Within State |
| 112 | Gidhni- Jamboni | | West Bengal | Within State |
| 113 | Chandua- Joka | | West Bengal | Within State |
| 114 | Kankrajhore- Lalgarh | | West Bengal | Within State |
| 115 | Mahilong- Kalimati | | West Bengal | Within State |
| 116 | Jhalda- Baghmundi | | West Bengal | Within State |

| S No | Elephant Corridor | Region | States | Type |
|---|---|---|---|---|
| 117 | Chandil- Matha | East-central | West Bengal and Jharkhand | Interstate |
| 118 | Gobarghusi- Jhunjhaka- Banduan | | West Bengal and Jharkhand | Interstate |
| 119 | Tri-Junction | Southern | Andhra Pradesh | Within State |
| 120 | Rayala ER | | Andhra Pradesh | Within State |
| 121 | Kaniyanpura - Moyar | | Karnataka | Within State |
| 122 | Begur - Brahmagiri | | Karnataka and Kerala | Interstate |
| 123 | Edayarahalli - Doddasampige | | Karnataka | Within State |
| 124 | Edayarahalli - Guthiyalathur | | Karnataka | Within State |
| 125 | Talamalai - Chamrajnagar (Pununjur) | | Karnataka | Interstate |
| 126 | Karadikkal - Madeshwara | | Karnataka | Within State |
| 127 | Talamalai - Chamrajnagar (Muddahalli) (Talavadi-mudahalli) | | Karnataka and Tamil Nadu | Interstate |
| 128 | Kudrakote- Thirunelly | | Kerala | Within State |
| 129 | Kottiyur- Peria | | Kerala | Within State |
| 130 | Peria- Pannippad (Peria at Pakranthalam) | | Kerala | Within State |
| 131 | Nilambur- Appankappu | | Kerala | Within State |
| 132 | Nilambur Kovilakam- New Amarambalam | | Kerala and Tamil Nadu | Interstate |
| 133 | Srivilliputur-Saptur | | Tamil Nadu | Within State |
| 134 | Kallhatti – Sigur at Glencorin | | Tamil Nadu | Within State |
| 135 | Avarahalla at Sigur | | Tamil Nadu | Within State |
| 136 | Kalmalai – Singara and Avarahalla, | | Tamil Nadu | Within State |
| 137 | Moyar – Avarahalla | | Tamil Nadu | Within State |
| 138 | Siluvaimedu - Kadamparai | | Tamil Nadu | Within State |
| 139 | Anamalai at Waterfalls estate | | Tamil Nadu | Within State |
| 140 | Sholayar Dam (Vazhachal – Anaimalai via Sholayur) | | Tamil Nadu | Within State |
| 141 | Topslip to Navamalai | | Tamil Nadu | Within State |
| 142 | TANTEA (Vazhachal – Anaimalai via Ryan) | | Tamil Nadu | Within State |
| 143 | Talamalai – Guttiyalattur | | Tamil Nadu | Within State |
| 144 | Mukurthi – Mudumalai | | Tamil Nadu | Within State |
| 145 | Anaikatti North – Anaikatti South | | Tamil Nadu | Within State |
| 146 | Anamalai at Punachi | | Tamil Nadu | Within State |
| 147 | Kallar at Gandhapalllayam (Jaccanaire Slope - Hulikal Durgam) | | Tamil Nadu | Within State |
| 148 | Thalli- Bilikal | | Tamil Nadu and Karnataka | Interstate |
| 149 | Bilikal- Jawalagiri | | Tamil Nadu and Karnataka | Interstate |
| 150 | Mudumalai – Nilambur via O' Valley | | Tamil Nadu and Kerala | Interstate |

*Annexure - II*

**Teams that carried out ground-truthing of elephant corridors**

| S. No. | State | Teams | Month |
|---|---|---|---|
| **1.** | Andhra Pradesh | Dr. Lakshminarayanan, Project Scientist, WII<br>Shri. Rakesh Kalva, Consultant: Andhra Pradesh Forest Department | May 2023 |
| **2.** | Arunachal Pradesh | Dr. Anil Singh, Team Leader, Tarai Landscape, WWF - India<br>Dr. Prajna Panda, (former) National Coordinator, Elephant Cell, WII | May 2022 |
| **3.** | Assam | Dr. Anil Singh, Team Leader, Tarai Landscape, WWF - India<br>Dr. Prajna Panda, (former) National Coordinator, Elephant Cell, WII<br>Dr. Bibhuti lahkar, Scientist, Aranyak | February 2022 |
| **4.** | Bihar | Dr. Anil Singh, Team Leader, Terai Landscape, WWF - India | May 2023 |
| **5.** | Chhattisgarh | Dr. Lakshminarayanan, Project Scientist, WII | October 2022 |
| **6.** | Jharkhand | Shri Aditya Bisht, Consultant-B, MoEF&CC<br>Shri Aakriti Singh, SRF, WII | April 2023 |
| **7.** | West Bengal | Shri Aditya Bisht, Consultant-B, MoEF&CC<br>Shri Aakriti Singh, SRF, WII | March 2023 |
| **8.** | Odisha | Dr. K.M. Selvan, Scientist E, MoEF&CC<br>Dr. Lakshminarayanan, Project Scientist, WII<br>Shri Aditya Bisht, Consultant-B, MoEF&CC<br>Shri Udhayaraj, GIS Specialist, WII<br>Ms. Aakriti Singh, SRF, WII | June 2023 |
| **9.** | Kerala | Dr. K.M. Selvan, Scientist E, MoEF&CC | April 2023 |
| **10.** | Meghalaya | Shri Aditya Bisht, Consultant-B, MoEF&CC<br>Shri Udhayaraj, GIS Specialist, WII | April 2023 |
| **11.** | Nagaland | Dr. K.M. Selvan, Scientist E, MoEF&CC<br>Sh. Imnawapang Jamir, Ph. D. Scholar, Department of Forestry, Mizoram University | April 2023 |
| **12.** | Uttar Pradesh | Dr. Prajna Panda, (former) National Coordinator, Elephant Cell, WII | December 2021-January 2022 |
| **13.** | Uttarakhand | Dr. Anil Singh, Team Leader, Terai Landscape, WWF - India<br>Shri Aditya Bisht, Consultant-B, MoEF&CC<br>Dr. Lakshminarayanan, Project Scientist, WII | January-March, 2023 |
| **14.** | Karnataka | Dr. Lakshminarayanan, Project Scientist, WII<br>Shri. R. Raghuram, Himagiri Wildlife Trust | June 2023 |
| **15.** | Tamil Nadu | Dr. Prajna Panda, (former) National Coordinator, Elephant Cell, WII<br>Dr. Boominathan, WWF-India<br>Dr. Lakshminarayanan, Project Scientist, WII | June 2022 |

*Annexure – III*

**Corridor data sheet**

1. Name of the Corridor:……..
2. FD/PA/District:……..
3. Connecting (Ranges/FDs/RFs/PAs): ……to …….
4. Geographical coordinates: ……
5. Area and dimension: Length…….. Width (minimum and maximum):…….Total Area:……Sq. km
6. What was the corridor boundary delineated based on? (Was the boundary of the corridor identified based on published research/ observations/ strong barriers on either side/ anecdotal evidence/ etc.):…….
7. Critical area/ bottleneck in corridor:……..
8. If there is bottleneck, mention the major reasons of constriction/ bottleneck: ……
9. Altitude (Minimum and Maximum):……..
10. Map of the corridor (Attach a map):
11. Importance of the corridor at a landscape scale:

**Status of structural connectivity:**

12. Demarcation of corridor (Mention Compartment/ Block/Range/FD and its area in corridor): ……
13. Major Land use: Forest/Agriculture/ plantation (Tea/ Coffee/ any other plantation)/ settlement/ river: ……
14. Habitat type/ Forest type/ Vegetation: ……
15. Status of corridor forest (Intact/ Degraded):……
16. Nearest PA: ……
17. Legal Status of the corridor (PA/ RF/ Revenue land/ community forest/private forest/private land):……
18. Total areas under different categories:……

| Land use | Area (In ha.) |
|---|---|
| Forest | |
| Agriculture | |
| Habitation | |

**Elephant Movement Status/ corridor use:**

19. Status of elephant movement (Regular/ Seasonal/ Occasional):…….
20. If seasonal or occasional, specify season and month when elephant usage the corridor area:……
21. Specify the usages (Used by Loners/ elephant herd or Both):…….
22. Group size:……
23. Specify the period (season/ month) used by loner and herd:……...
    Loners:
    Herd:
24. Probable reasons of elephant visit/ usage of corridor areas:……
25. For how long elephants are using the corridor area (No. of years):……
26. Current status of elephant movement (Increased/ decreased, compared to 10 years ago):…….
27. Possible reasons of increase/ decrease in elephant movement:……...
28. No. of elephant reported from corridor areas during last elephant population estimation (Mention year of population estimation exercise and number of elephant):……...
29. No. of elephant movement reported by publish report/ paper based on corridor monitoring/ study undertaken by any institute/ organization (Provide reference of Report/ Paper):……..……
30. If any elephant photograph captured during AITE/ Tiger monitoring from the corridor area (Provide detail about number of elephant captured, date etc.):……..……
31. Mention other important species using this corridor:……

**Major habitations/ Settlements:**

32. Number of Villages/ settlements falling within the corridor area:……
33. Total number of HH of villages/ settlements falling within the corridor area: ……
34. Number of corridor dependent villages/ settlements outside the corridor area:……
35. Total number of HH in corridor dependent villages/ settlements outside the corridor area: ……..
36. Dependencies of community living in and around corridor areas on corridor forests/ resources (For Fuel wood, Fodder, Grazing, NTFP collection, water for irrigation etc.) …….

**Status of Human Elephant Conflict (HEC) in and around corridor areas:**

37. Number of villages in and around corridor area affected due to HEC:……...
38. Total crop/ plantation area damaged by elephant annually:……
39. Major crop/ plantation prone to damage by elephant:……
40. Seasonality of crop depredation (month):……..

| Type of crop | Months |
|---|---|
| | |
| | |
| | |

41. Status of house/ property damage (Number of house/ properties damaged by elephants in villages/ settlements in and around corridor area- In last five years):……
42. Seasonality of house/ property damage (Month)……..:……..
43. Status of human casualties (Number of human death/ injuries reported due to human elephant conflict from villages/ settlements in and around corridor area- In last five years):……
44. Status of elephant death due to conflict (Number of elephant death reported due to human elephant conflict in and around corridor area- In last five years): ……

**Threats to the corridor:**

45. Presence of linear infrastructure in the corridor area (Road, Railway track, canal, Power line etc.):

A. Mention about road, if any (National Highway/ State highway):……..
a. Total length of road through corridor area:……..
b. Status of vehicular traffic (Based on survey undertaken, if any):……
c. Wildlife mortality information, if any (For last one year):……
d. Mitigation measures (overpass/ underpass) undertaken to facilitate elephant movement in corridor area, if any:……..

B. Railway track (Broad/ meter gauge, single/ double track, electrified/ non-electrified):……
a. Length of the railway track through corridor area and daily rail traffic:……
b. Wildlife death due to train hits, if any (For last one year):……..

C. Canal (Irrigation/power):……..

a. Length of canal through corridor area:……

b. Type of embankment (earthen/ concrete) and slope: ……..

c. Is there any impact of canal on elephant movement?:…….

d. Any bridge or underpass on canal in the corridor area which is being used by elephant:……...

D. Detail of high-tension power line through corridor area (Voltage and Length through corridor area): ……...

46. Are there fences/ trench/ wall in the corridor? (Yes/No).....

47. If yes, total length of power fence/ trench/ wall in corridor area:……..

48. Impact of existing fence/ trench/ wall on elephant movement, if any:……..

49. Are there other threats in the corridor? (eg. Poaching, logging, over-extraction of resources):……..……

50. Presence of industry/ Industrial area inside or near the corridor (Yes/No):……

51. If Yes, total area of the industry and total work force:……

52. Is there any impact of industry/ industrial area on elephant movement?:……...

53. Detail of other establishments inside or near corridor area:

54. Type of establishment (Institutional building/ tourism infrastructure/ government establishment or building):……..

55. Total area of establishment inside the corridor or impacting the corridor:……..

56. Impact of establishment on elephant movement, if any:……

57. Year of construction/ establishment:……...

58. Detail of encroachment, if any inside the corridor area (If yes, mention total area and other detail):……

59. Is encroachment impacting the elephant movement?.....

60. Suggested conservation measures/ specific recommendations:

……

……

……

……

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

*Project Elephant,*
*Ministry of Environment, Forest & Climate Change*
*6th Floor, Jal Block,*
*Indira Paryavaran Bhawan, Jor Bagh Road,*
*New Delhi 110003.*