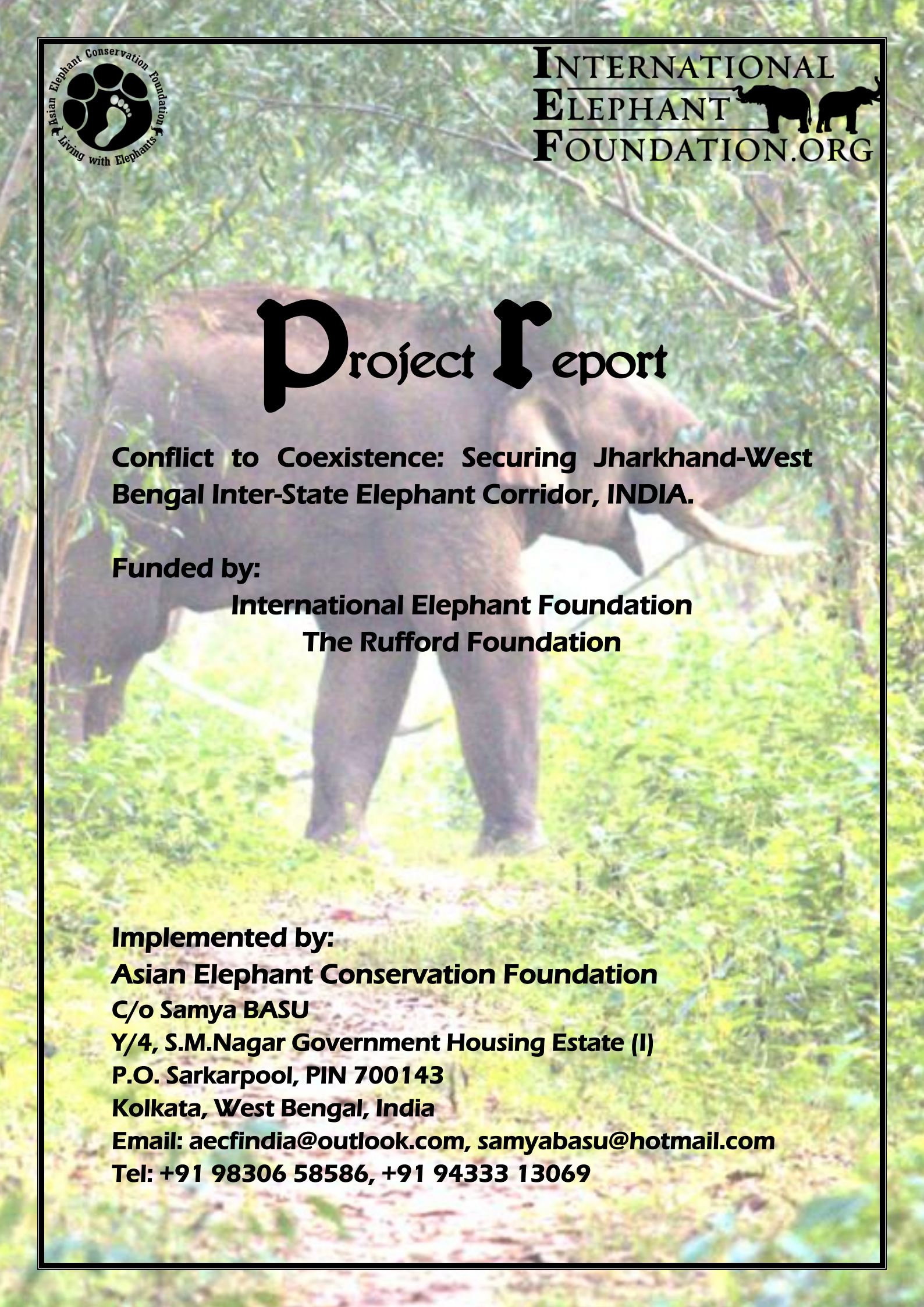

Project Report

Conflict to Coexistence: Securing Jharkhand-West Bengal Inter-State Elephant Corridor, INDIA.

Funded by:

International Elephant Foundation

The Rufford Foundation

Implemented by:

Asian Elephant Conservation Foundation

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2. List of the overall and specific conservation needs this project addressed:

The project site is an ecologically important elephant migration corridor which link Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal.

The number of elephants in 'Mayurjharna Elephant Reserve' (414.06sq.km.) and extended 'Zone of influence' (1436sq.km) has increased by approximately 67.80% during last 08 years (i.e. 118+ in 2010 to 198+ in 2017). These elephants are sub-divided into 153+ migratory, 17+ Mayurjharna and 28+ residential elephants with several sub groups. In last 8 years the elephant population has increased by 67.8% which contributes 28.80% of the state population, but claims more than 60% damages.

These elephants enter West Bengal from neighbouring Jharkhand state through Mahilong (Jharkhand) - Kalimati (West Bengal); Chandil (Jharkhand) - Matha (West Bengal); Jhunjhaka (Jharkhand) - Banduan (West Bengal); Dalapani (Jharkhand) - Kankrajhore (West Bengal) corridors. The population is expanding their home range in 10 forest divisions and in last 5 years (2011-2016) killed 163 people, injured 217+, and damaged 8053 huts, and 20,000+ hectares of crops and on the other side the 50+ elephants died (including natural and accidental incidents).

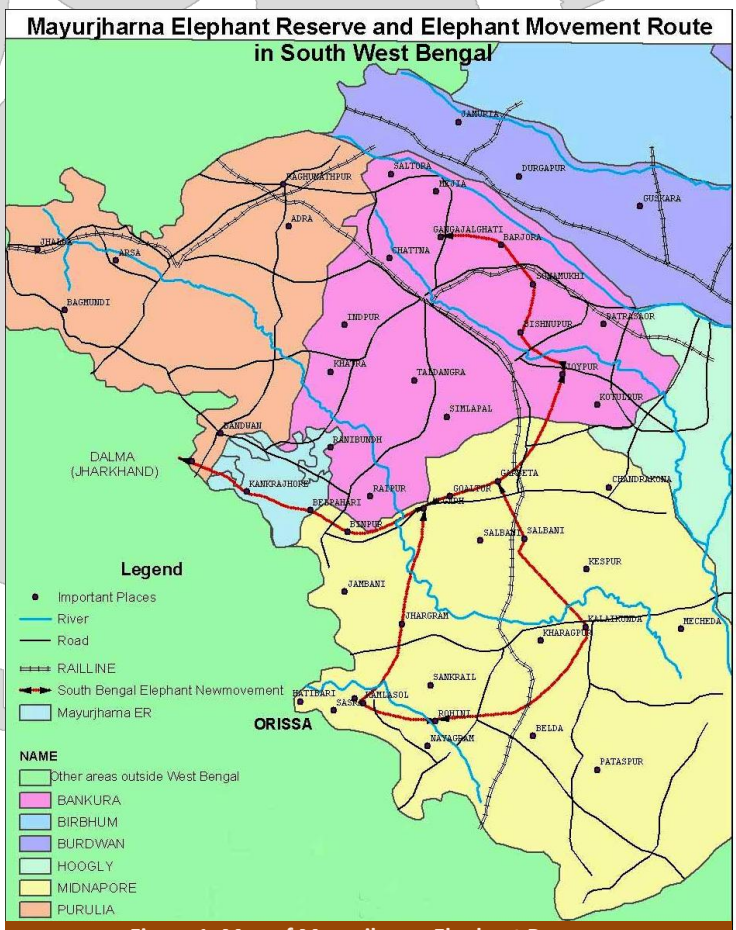

Figure 1: Map of Mayurjharna Elephant Reserve (Source: West Bengal Forest Department)

Since July 2016, to combat HEC, West Bengal Government blocked these corridors by 'Energised fence', 'Elephant Proof Trench', human-barrier with fire torches etc. to stop inter-state elephant migration. This unethical and unscientific mismanagement caused limited resource availability to this long-ranging animal and also increased the depredation in the corridor-dependent villages. Actually, we

realised that the Government took those action to hide their inability to manage the HEC through proper support to ground staffs.

This IEF project was an 'Emergency Initiative' to secure the safe passage to the migratory elephant herds through these existing Jharkhand-West Bengal Inter-State Elephant Corridors by research, community awareness, capacity building. Our primary intention was to develop a safe and free passage for elephants through community participation towards Human-Elephant Coexistence. Prime objective of the project is to find out the ways to mitigate Human-Elephant 'Conflict' in the corridor dependent villages, secure safe passage for the elephants and conduct training programme and remove the barriers in inter-state migratory routes.

The stakeholders know the importance of the free passage of this long-ranging herbivore as they are experiencing the elephant migration for more than 70 years or more (*there is also evidence of elephant migration in local mythological stories and documents written by British rulers*). During our interaction with them to share our objectives and ideas to secure the safe passage of the elephants, we got mixed responses from them and also understood that their grievance about the low rated and delayed ex-gratia payment.

In 2017, the majority of elephants entered the West Bengal 2 months later than their usual migration calendar due to blockage in their interstate migratory corridors. By that time 'Elephant Proof Trench (EPT)', electric fences were not effective due to heavy monsoon and lack of maintenance, and human barriers were forcefully removed by the local stakeholders, but only a monitoring team under supervision of forest department were present in the entry points. In 2018, only the monitoring team will be present there to secure the safe passage of the elephants through forest patches and adjacent villages.

3. Summarize the goals and objectives and describe any changes in goals and objectives from the original proposal.

Project objective I: The prime objective of the project is to find out the ways to secure the safe passage of migratory elephant herds through the existing inter-state corridors and suggest suitable alternatives of physical barrier on state border installed by government of West Bengal in 2016 to restrict elephant migration.

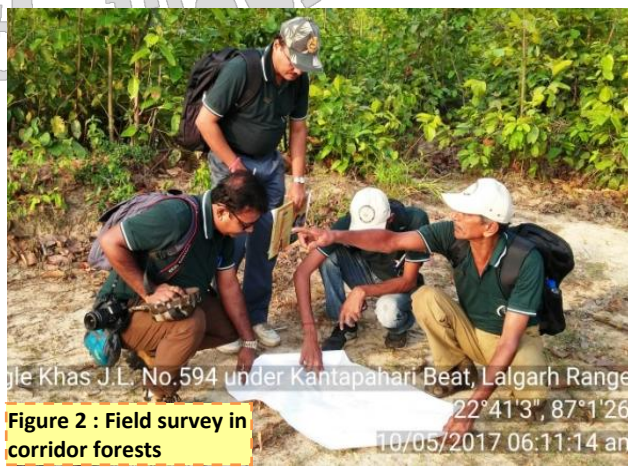

Figure 2 : Field survey in corridor forests

Changes in objectives: No changes in the objective.

Project objective II: Study of the ecological condition, fodder availability etc. for habitat management and develop updated database and maps of the inter-state elephant corridors. We intend to develop the recommendation to mitigate human-elephant hostility, for example, we will develop a seasonal movement calendar of elephants which can be used for agricultural planning and protection.

Figure 3 : Study of ecological condition in corridor forests

Changes in objectives: No changes in the objective. But the detail study needs preferably two more years to document the mentioned parameters to understand the habitat status completely.

Project objective III: Intensive community capacity building in corridor dependant villages and awareness workshop to minimize the impact of elephant depredation and human-elephant hostility by 50% comparative to last years.

Figure 4 : Pre installation testing of 'Fore-alarm system'

Changes in objectives: Apart from the inter-state corridor dependent villages we conducted capacity building programme in human-elephant 'conflict' prone zones of 'Influence Zones' as advised by forest department or local governments.

Project objective IV: Set up a model 'Anti-depredation Squad' to minimise the depredation during elephant migration in human dominated landscape.

Changes in objectives: No change in objective.

Figure 5 : The Anti-depredation Squad is protecting the villages from elephant depredation

Project objective V: Develop opportunities for local students to work as

volunteers in the project.

Figure 6 : Samya Basu explaining community attitudinal survey techniques to the students

Changes in objectives: Due to the hard field life, long stay in forests, whole night tracking of elephant herds and several encounters with elephants, the students/volunteers are getting scared and not intend to continue the work for long period. We are planning to involve them after a field workshop in next round which will also help them in their capacity building.

4. For each objective, describe the specific actions taken to achieve that objective.

Project objective I: The prime objective of the project is to find out the ways to secure the safe passage of migratory elephant herds through the existing inter-state corridors and suggest suitable alternatives of physical barrier on state border installed by government of West Bengal to restrict elephant migration.

Figure 8 : Forest guards in front of EPT

Specific actions taken to achieve that objective: The stakeholders are well aware about the need of the free passage of the long-ranging herbivore and we interacted with them to share our objectives and ideas to secure the safe passage of the elephants. We got positive responses and also understood that their grievance about the low rated and delayed ex-gratia payment. In 2017, the 'Elephant Proof Trench (EPT)', electric fences were ineffective

Figure 7 : Free passage through village during inter-state migration

and human barriers were removed by local stakeholders, but only a monitoring team under supervision of forest department is present in the entry points.

In the proposal we have mentioned 4 corridors which are connecting elephant habitats of Jharkhand and West Bengal, but during our field work we have documented another inter-state corridor between Odhisa and West Bengal which is never studied to know the importance and viability. We did a baseline survey of that corridor forest as this inter-state corridor is also facing same problem of physical barrier to restrict elephant migration to Odhisa from West Bengal.

Figure 9 : Degraded Elephant Corridor Forest

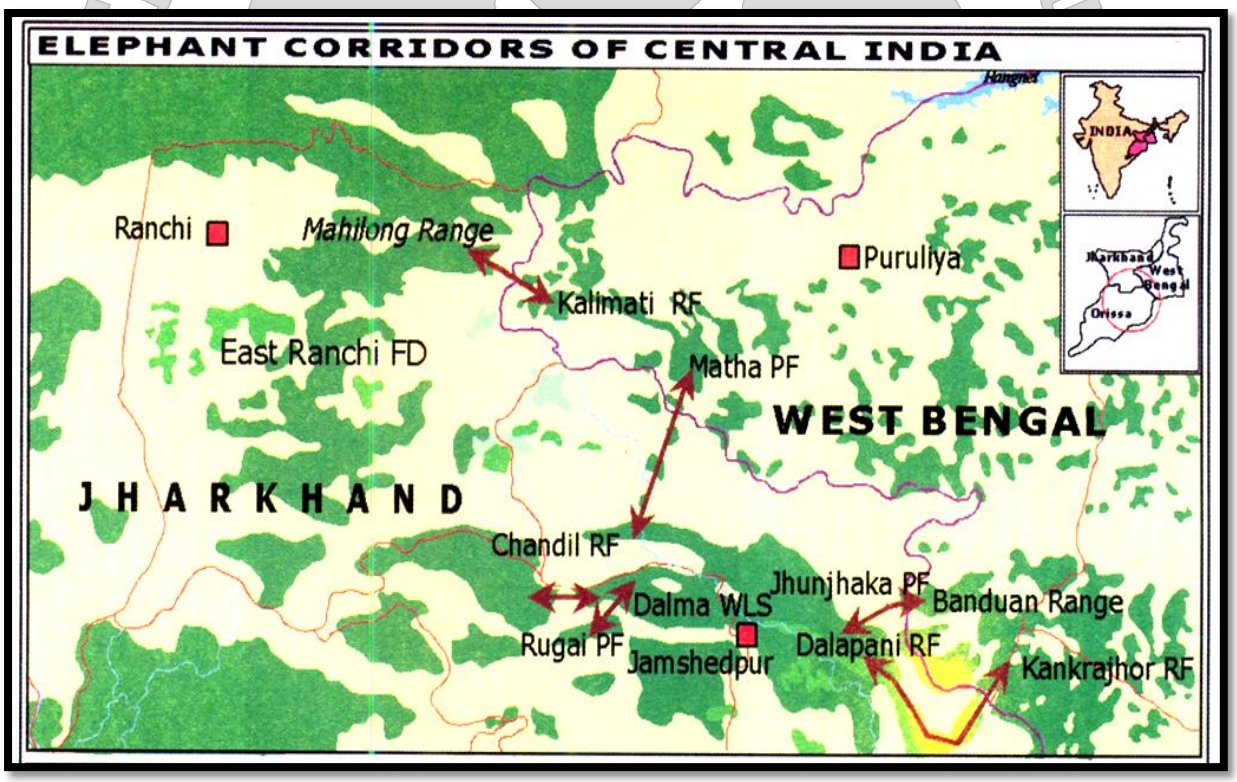

Figure 10 : Inter-state Elephant Corridors, Map Source: WTI

We also observed the following status of the four (04) corridors in the study area and those are mentioned below in table form:

<table>
<tr><th colspan="2">Jharkhand - West Bengal Inter-state Corridor</th><th>Comments</th></tr>
<tr><td colspan="2">Mahilong | Kalimati
$23^0$15′N – $23^0$19′N and $85^0$49′E – $85^0$53′E</td><td rowspan="2">Elephants use Mahilong (Jharkhand) - Kalimati (West Bengal) corridor frequently in post-monsoon to pre-winter. The herd consists of approx 18+ migratory elephants with short home range. These elephants are stays minimum 2 days to maximum 9-10days in the area. Apart from that there are 3-4 residential elephants which stays throughout the year and causes damage to house, crops etc.</td></tr>
<tr><td colspan="2">Chandil | Matha
$22^0$59′N – $23^0$07′N and $86^0$05′E – $86^0$06′E
and
Jhunjhaka | Banduan
$22^0$50′N – $22^0$51′N and $86^0$25′E – $86^0$27′E</td><td>These elephant corridors are no longer exists in the West Bengal region. Although the natural vegetation and water sources are good, but the habitats are highly fragmented by the highways, railways, industries and human settlements. These elephant corridors are used by elephants (max 8-10 in numbers) rarely during in crop seasons, but the seasonal short range local migration of residential elephants can be observed occasionally.</td></tr>
<tr><td colspan="2">Dalapani | Kankrajhore
$23^0$39′77″N – $22^0$41′54″N and $86^0$30′13″E – $86^0$36′25″E</td><td>This is only active (highly) elephant corridor with high priority of conservation. Majority of migratory herds take this route to enter West Bengal. The corridor has more than 37 species of elephant fodder and the forest is a continuous one in entire Jhargram division (Bhulaveda and Belpahari forest range). In 2018 approx, 125+ elephants used the corridor for their to and fro journey.</td></tr>
</table>

Project objective II: Study of the ecological condition, fodder availability etc. for habitat management and develop updated database and maps of the inter-state elephant corridors. We intend to develop the recommendation to mitigate human-elephant hostility, for example, we will develop a seasonal movement calendar of elephants which can be used for agricultural planning and protection.

Specific actions taken to achieve that objective: We have studied the ecological condition, fodder availability, water sources and human interference etc. to develop updated database and maps of the inter-state elephant corridors.

Figure 11 : Forest nursery for elephant fodder plant

The two active migratory corridors (Dalapani-Kankrajhore and Mahilong-Kalimati) were well documented and maps are being developed. We developed recommendation to mitigate human-elephant hostility in these areas in consultation with local villagers which yet to be implemented.

Project objective III: Intensive community capacity building in corridor dependant villages and awareness workshop to minimize the impact of elephant depredation and human-elephant hostility by 50% comparative to last years.

Figure 12 : Death of village woman during NTFP collection

Specific actions taken to achieve that objective: We have conducted several awareness programmes and capacity building programme for villagers. We have documented the resource dependency (i.e. NTFP, fuel-woods etc.) of villagers on elephant habitat to work on possibilities of introduction of alternate livelihood practices. We have also worked in sample villages to introduce low-cost mitigation techniques like unpalatable crops, cash crops and fore-alarm system. But, we realised that, such programmes need to be continued to change the attitude of villagers for long term effect. In 2017-18, no elephants were killed in the area by retaliatory attitude though 1 people were killed by the migratory elephants during driving at 2:45 am and 2 other people were killed by the residential elephants in 2018.

Figure 13 : Anti-depredation Squad vehicle provided by the West Bengal Forest Department

Figure 14 : Anti-depredation Squad

Project objective IV: Set up a model 'Anti-depredation Squad' to minimise the depredation during elephant migration in human dominated landscape.

Specific actions taken to achieve that objective: In the proposal we mentioned to set up ONE 'Anti-depredation Squad or ERS' and selected the Dalapani (Jharkhand)-Kankrajhore (West Bengal) area for the same. The ERS was formed by the local villagers and elephant drive. Several orientations, meetings, assistance during elephant driving were organised from them. Equipment, uniforms etc. were also distributed among them.

Project objective V: Develop opportunities for local students to work as volunteers in the project.

Figure 16 : Nature exposure programme for students from elephant corridor dependent villages with support from West Bengal Forest Department

Specific actions taken to achieve that objective: To develop local conservation stewards we have conducted several capacity-building programmes for local young people in colleges, high schools and villages. They got a basic training on monitoring the elephant population migration and mitigate human-elephant hostility in their locality. Students' participation in these seminars, workshops was very good and very much interactive. During personal communication with teachers and students we found that they are interested to take the elephant conservation work as their M.Sc and B.Sc. dissertation/projects, though there is a lack of confidence in them to work in the forefront in the field for Human-Elephant 'Conflict'

Figure 15: Painting competition as part of awareness programme

mitigation. We are planning to involve them after a field workshop which will also help them in their capacity building.

5. Describe any activities that differ from the original proposed actions and explain the reason for the change.

A. In the proposal we have mentioned 4 corridors which are connecting elephant habitats of Jharkhand and West Bengal, but during our field work we have documented another inter-state corridor between Odhisa and West Bengal to know the importance and viability which is also facing same problem of physical barrier to restrict elephant migration to Odhisa from West Bengal. Apart from that, we have found that 2 out of 4 corridor experiences elephant migration and only Dalapani-Kankrajhore is used by major number of migratory elephants and needs high priority for conservation. Thus we spend majority of effort for habitat protection and to ensure safe passage for elephants in this corridor and protect the villages from depredation..

Figure 17 : Depredation in villages by residential elephants

B. In the proposal we mentioned to set up ONE 'Anti-depredation Squad or ERS' and selected the Dalapani (Jharkhand)-Kankrajhore (West Bengal) area for the same. But, we conducted a basic orientation programme for another ERS in Mahilong (Jharkhand)-Kalimati (West Bengal) corridor area. This Mahilong (Jharkhand)-Kalimati (West Bengal) corridor is used by elephants by almost every day as there are approx 18+ migratory elephants and 3-4 residential elephants with short home range. Now, the area is facing regular 'conflict' with the elephants.

C. In last 3 months, for the first time, a stray Royal Bengal Tiger has been found in the elephant corridor forest areas which somehow hampered post-winter habitat surveys and also disturbed the areas due to activities of forest managers to capture and relocate the tiger.

Figure 18 : Stray tiger in corridor forest

D. In the proposal we have mentioned to do intensive community capacity building in corridor dependant villages and awareness workshop to minimize the impact of elephant depredation and human-elephant hostility by 50% comparative to last years. But, apart from the inter-state corridor dependent villages we conducted

capacity building programme in human-elephant 'conflict' prone zones of extended home range as advised by forest department or local governments.

E. We also found some physical barriers along elephant migration routes outside Mayurjharna Elephant Reserve areas. These barriers were also partially removed and we communicated with the villagers to secure the safe passage to the elephants. In the next round we will include these areas in project site.

Figure 19 : Energized fence in forest to protect corridor dependent villages

6. Describe the conservation outcomes for elephants, other wildlife, habitat and human communities, and list major findings and accomplishments to date.

Figure 21 : Elephant depredation in agricultural fields

Asian Elephant (*Elephas maximus*), the 'National Heritage Animal' of India, is listed as Endangered (EN A2c) in IUCN RDB and CITES Appendix I. A recent estimate for the global population size of the Asian elephant was 41,410 to 52,345 animals (Ref: The IUCN Red List of Threatened Species, ISSN 2307 8235 (online), IUCN 2008: T7140A12828813). The estimated population size in India 26,390–30,770 and the population size in proposed study area are 198+ in 2017 and this population is extending their home range in human dominated landscape. Southern West Bengal (henceforth SWB), along with 'Mayurjharna Elephant Reserve' (henceforth MER), is the only elephant reserve for the Eastern India elephant population. In last 8 years the elephant population has increased by 67.8% which contributes 28.80% of the state population, but claims more than 60% damages.

Figure 20 : Elephant herd moving through crop field without any resistance

The project succeeded to remove/make no effective the physical barrier in the inter-state elephant migration corridor in Jharkhand-West Bengal border areas, which facilitate the elephant movements. The community participation in these corridor forest villagers was really appreciable for

securing the safe and free passage to the migratory elephant herds. It is also great news that no retaliatory killing of elephant took place in 2017-18 (till March). During the return journey, we estimated 11 calves with the herds which also indicate that the natural condition is favourable for elephants in the project site and extended home range.

The other common animal in the study area are Indian Wolf, Wild Boar, Jackal, Bengal Fox, and Indian Pangolin, Python etc. The most recently, for the first time in the area, one Royal Bengal Tiger was recorded and residing there since January 2018 end. All these indicate a healthy forest area which supports biological diversity.

Figure 22 : The Royal Bengal Tiger at elephant corri

The community capacity building programme conducted till date were focussed on HEC mitigation techniques like low-cost crop-guarding system, fore-alarm system, alternate livelihood practices, crop alteration, save period of cultivation of cash crops, unpalatable long-awned (bristles) paddy, chilly etc. through training and field verification in corridor dependent villages to mitigate human elephant hostility. The project also played a good role in communication and confidence building of stakeholders which helped to minimise the retaliatory attitude. We have formed the Anti-depredation Squad of 45 people and supported the Anti-depredation Squad by donating shoes, rainsuits etc. and equipments.

Figure 23 : Anti-depredation Squad

In 2017-18, no elephants were killed in the area by retaliatory attitude though 1 people were killed by the migratory elephants during driving at 2:45 am and 2 other people were killed by the residential elephants in 2018. Apart from all these, we have

Major findings and accomplishments to date:

The project site is an ecologically important habitat which link Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal through the Mahilong (Jharkhand) - Kalimati (West Bengal); Chandil (Jharkhand) - Matha (West Bengal); Jhunjhaka (Jharkhand) - Banduan (West Bengal); Dalapani (Jharkhand) - Kankrajhore (West Bengal) elephant migration corridors. The number of elephants has increased by 108% during last 12 years (i.e. 95 in 2005 to 198+ in 2017) in 'Mayurjharna Elephant Reserve' (414.06sq.km.) and the extended 'Zone of influence' (1436sq.km) and are sub-divided into 130+ migratory, 17+ Mayurjharna and 30+

residential elephants with several sub groups. In last 8 years the elephant population has increased by 67.8% which contributes 28.80% of the state population, but claims more than 60% damages.

Since July 2016, to reduce HEC and depredation, West Bengal blocks these corridors by 'Energised fence', 'Elephant Proof Trench', human-barrier with fire torches etc. to restrict inter-state elephant migration. This unethical and mismanagement caused limited resource availability to this long-ranging animal and also increased the depredation in the corridor-dependent villages.

Figure 24 : Elephant Proof Trench at interstate border

Prime objective of the IEF project is to find out the ways to mitigate Human-Elephant 'Conflict' in the corridor dependent villages, secure existing Jharkhand-West Bengal Inter-State Elephant Corridors for safe passage of the elephants and conduct training programme for villagers to set up a model 'Anti-depredation Squad'.

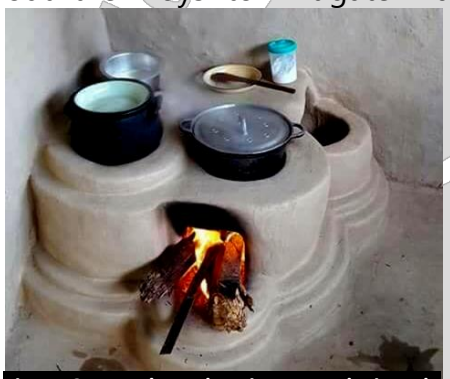

Figure 25 : Fuelwood saving oven designed for villagers to reduce pressure on forests

We have done a baseline survey of the corridors and interacted with the adjacent villages during sensitization and capacity building programme. We also communicated with forest managers and local villagers and explained 'how we can change the conflicts to coexistence' through few precautions and activity. We also requested them to give free passage to the elephants. Finally, the physical barriers from the inter-state border had been removed and the safe passage was given to the migratory elephant herds.

We have enumerated the elephant population in project area through direct sighting and fixed point count (waterhole techniques). The enumeration of resident elephant and their home range marking is not done completely as it requires visiting entire home range which is outside the corridor forests area. We have also documented the fodder species available in the corridor forests. Unfortunately, the forest department is not doing fodder plantation for last 5 years or more. We have visited

Figure 26 : Capturing the elephant in camera

several forest nurseries to know the status and found that the government encouraged the forest department to plant economically profitable tree saplings. Presently, we communicated with the local forest managers and after a short discussion we shared the fodder plant list with them and they accepted the need of fodder plantation and assured us to reinitiate the fodder plant sapling development and distribution/plantation shortly. We are also looking forward for the coming monsoon.

Among the above mentioned corridors, the Dalapani (Jharkhand) – Kankrajhore (West Bengal) corridor is the most vital elephant corridor between Singhbhum Elephant Reserve and Mayurjharna Elephant Reserve. Almost entire elephant herds use this corridor to enter Mayurjharna ER (West Bengal) during interstate migration. The resource availability of the area is not sufficient to support the herds. This corridor is threatened due to human settlement, agricultures, roads, dams and defence exercises. The forest department officials and we jointly moved to protect the forests from timber poachers and 17 people were arrested and 2 vehicles, several logs and firewoods seized from the corridor.

Figure 27 : The timber poachers has been prosecuted

The Mahilong (Jharkhand) – Kalimati (West Bengal) corridor is mostly used by a small herd of approx. 18+ elephants who migrates upto forest of 'Ajodhya Hilltop'. This corridor is used by the elephants only during the crop season. The Chandil – Muri railway track is a high threat to the elephants in this area and a hydroelectricity plant which makes the forest degraded. We observed that the period of elephant herd here is usually 2-3 days whereas Dalapani-Kankrajhore elephant herds stays for a period of 10 months minimum.

The Chanil (Jharkhand) – Matha (West Bengal) and Jhunjhaka (Jharkhand) - Banduan (West Bengal) corridor forest is occasionally used by the elephants for their migration. One can considers these two corridors as inactive as per last five years data. These entire corridors are highly fragmented by human settlement, agricultural lands and railway tracks/roads and similarly threatened by timber poachers, intentional forest fires etc.

As part of habitat survey, we have identified the following plants as elephant fodder by direct observations and secondary evidences:

List of fodder plants observed in Mayurjharna Elephant Reserve

Family	Sc. Name	Local name	Parts eaten
Anacardiaceae	*Buchanania lanzan*	Piyal	Leaf, Bark
	Semecarpus anacardium	Bhela	Bark, Root
	Mangifera indica	Aam	Leaf, Fruit
	Lannea coromandelica	Doka/Jeol	Bark, Leaf
Apocynaceae	*Halorrhena antidysenterica*	Kurchi	Entire plant
Bombacaceae	*Bombax ceiba*	Shimul	Tender root, Leaf, Bark
Caesalpiniaceae	*Bauhinia vahlii*	Chihar	Bark
Cochlospermaceae	*Cochlospermum gossypium*	Galgoli	Bark, Leaf
Combretacea	*Terminalia bellerica*	Bahera	Leaf, Fruit
Dilleniaceae	*Dillenia indica*	Chalta	Fruit
Ebenaceae	*Diospyros melanoxylon*	Kend/Tendu	Tender shoot, Bark, Leaf
Euphorbiaceae	*Cleistanthus collinus*	Parashi	Leaf
	Trewia nudiflora	Pituli	Leaf
Fabaceae	*Pterocapus marsupium*	Piyasal (Murga)	Bark, Leaf
Flacourtiaceae	*Flacourtia ramontchi*	Boichi	Entire plant
Lacythidaceae	*Careya arborea*	Kumbhi (Astha)	Bark, Leaf
Liliaceae	*Smilax ovalifolia*	Ram dantan	Tender shoot, Leaf
Moraceae	*Ficus hispida*	Dumur	Fruit, Leaf
	Ficus benghalensis	Bat	Leaf, Young twig
	Artocarpus heterophyllus	Kanthal	Leaf, Fruit
	Ficus Religiosa	Aswath	Leaf, Young twig
Musaceae	*Musa paradisica*	Kala	Entire plant
Myrtaceae	*Syzigium cumini*	Jam	Leaf, Fruit
Poaceae	*Bambusa sp.*	Bansh	Tender shoot, Leaf
	Pennisetum sp.	Napier grass	Entire plant
Rubiaceae	*Gardenia gummifera*	Bhurru	Entire plant
	Ixora arborea	Lohajangi	Entire plant
	Adina cordifolia	Haldu	Leaf
Rutaceae	*Feronia limonia*	Koetbel	Fruit
	Aegle marmelos	Bel	Fruit
Sabaceae	*Butea superba*	Lata palash	Leaf
Sapotaceae	*Madhuca indica*	Mahua	Fresh Flower

This year we have observed that the elephants are changing their food habits and taking some new plants as food which are not included in the above list as we are working on that.

The habitat survey and elephant estimation in post-monsoon and crop- raiding pattern surveys were completed but need another season to get a better result. We have also documented the resource dependency (i.e. NTFP, fuel-woods etc.) of villagers on elephant habitat.

Figure 28 : Elephant herd is crossing village

Several awareness programmes and capacity building programme for villagers were conducted and introduced low-cost mitigation techniques like unpalatable crops, cash crops and fore-alarm system in sample villages but the villagers were not fully convinced to replace their traditional crops and other practices.

We are also developing local conservation stewards through several capacity-building programme for local young people in colleges, high schools and villages.

They got a basic training on monitoring the elephant population migration and human-elephant hostility in their locality.

As per time line, the Anti-depredation Squad is fully active and working with the supports from local villagers, forest managers and collaborative NGOs to secure the safe passage of elephants and protect the villages, crop fields etc.

7. Approximately how many humans are impacted by your project? Approximately how many elephants are impacted by your project?

In last project period we have reached 27+ villages and 5 colleges, 22 juniors and 7 senior's schools and conducted the awareness/capacity building programmes. Approximately 14,500+ students got opportunity to interact or take part in the programme through institutional participation. We are initiating a nature club in school which will be known as '**Jumbo & Juniors**'. Apart from that 45 people got intensive capacity building programme and support to develop 'Anti- depredation Squad'.

The project site is an ecologically important elephant migration corridor which links Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal. There is 198+ elephants in Mayurjharna Elephant Reserve and its zone of influence who use these corridor forest regularly and definitely they are benefitted by the project activities by removal of corridor blockage, habitat improvement and 'conflict' mitigation. In Singbhum ER, there is more than 450+ elephants and this population is gradually shifting their home range towards West Bengal, will also be benefitted in long term. Till date there is no retaliatory killing/electrocution in the study area as continuous presence of volunteers from local NGOs and colleges in the study area.

8. Describe any problems discovered or occurring during this grant period.

We did not face any major problem as we are familiar with the region, local cultures and language. Moreover, we have an advantage of good network with local villagers, NGOs and grassroots level forest staffs.

Figure 29 : Forest fire in elephant habitat

But, definitely, this year a new problem of tiger started in the area and the corridor forest villagers are highly panicked and are setting fires in the forest for safety from tiger. It not only damages the forest floors, microbes etc. but also big trees too. But, now they understand that, our objective is

to minimise the depredation and we are also working to mitigate the human-elephant hostility.

Presently they have extended their hand to support us during field works and accompanying us during elephant tracking, protecting the villages and elephants too.

9. Was your project successful? State short and long term goals that you are using to evaluate your accomplishments.

For the first year, we have achieved all the priority objectives successfully like securing the safe passage for migratory elephants, minimum loss of human life and properties, 'Zero' unnatural death or retaliatory killing of elephants, community capacity building, Anti-depredation Squad formation etc. We are not satisfied with the habitat survey programme in corridor forest. It needs minimum 2 to 3 years to reflect the result of at ground level.

- **Short-term goals**

The project site is an ecologically important elephant migration corridor which link Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal. The short term goals of the project are:

I. Immediate removal of blockage in Jharkhand- West Bengal inter-state corridor for free passage of migratory elephant herds from Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal. (**Achieved**)
II. Removal of physical barrier in fragmented corridors in non-forests area and set up team in villages for free passage of migratory elephant herds. (**Proposal for next phase**)
III. Study and documentation of ecological condition of elephant corridor forest and also study of threats to elephants in human-dominated landscape. (**Achieved**)
IV. Community participation in capacity building programme in corridor dependent villages to set up 'Anti-depredation Squad' to minimize the Human-Elephant hostility. (**Achieved**)
V. Develop elephant migration calendar and conflict intensity map to develop management plan to mitigate human-elephant hostility. (**Partially Achieved**)

- **Long-term goals**

I. Develop recommendation and implementation in sample blocks to restore the degraded habitat.

II. Change the attitude of people and reduce the probability of retaliatory killing/harming to the elephants through community awareness, sensitization and capacity building programme.

III. Develop updated database on the elephant migration, population, conflicts etc. and also develop present distribution and conflict zone maps along the corridor.

IV. Develop a human elephant conflict management plan under according to 'elephant density' and 'conflict intensity'.

10. Based on this Project, what is the "next step" for this project and does it have implications for future conservation actions?

The current project is new in its concept and this is first ever initiative to work on interstate elephant corridor. We will definitively continue the work as 1yr is not enough to study, draw management plan and implementation.

In the coming year we will do more study of ecological conditions of the elephant corridor forests and integrated habitat management. We will also conduct higher number of community capacity building programme to develop alternate livelihood options and also implement 'conflict' mitigation recommendation in sample villages.

Figure 30 : Timber poaching from elephant corridor forest

We have some specific plans to reach 'ZERO' death of elephants by electrocution, railways accident and retaliatory actions which we will do field verification in coming months and recommend in final report for implementation.

We also found that more orientation programme for the 'Anti-depredation Squad (ADS)' formed during current project and we have received request to from 3 more ADS in different forest division in Lalgarh (high HEC zone), Durgapur and Bagmundi (moderate HEC zone) region in coming year.

We also observed that the tuskers in the migratory elephant herds or residential groups are very few in number and *Makna (male elephants with no or very small teeth)* are increasing in number. We intend to study the ratio in next project round to get actual numbers to understand whether it is our error in documentation/observation or is there any adaptation is playing a role behind.

11. Provide at least one human interest story. This story should enable the reader to identify with the people, a problem, day-to-day situations, achievements or a funny or strange occurrence during the course of the project. Examples: a story about when the bull elephant put his tusk through the window of the research vehicle or the lion with a snare on his leg and the many weeks it took to find the animal and remove the snare or a specific family who benefitted due to the project. If available, please include a photo of the incident described.

There are many interesting stories on relation between man and elephant. We found an interesting behaviour of elephants evolved last few years in the area. The total strength of the migratory elephant herd is approximately 153+ in the study area (apart from residential elephants and *maljuria* group). During their exit migration from West Bengal we observed purely opportunistic crop raiding attitude of the herd. This year when the elephant reached *Kangsabati* River bed adjacent forests of Lalgarh range of Medinipur Forest Division (the 'Zone of Influence' outside 'Mayurjharna Elephant Reserve'), the local '*Hoola Dol*' (elephant drivers formed by local villagers under supervision of Forest Department) tried for more than 1½ months to drive out elephants from Lalgarh to 'Mayurjharna Elephant Reserve', the elephants started moving as per their direction but the herd splits into group of minimum 05 to maximum 20 elephants according to total strength whenever they get forest patches or sometimes the fog near river bed and very next day we found again them near the starting location. This behaviour continues for more than a month until the cultivated winter vegetables were available along the river bed. It was a good example of group communication and resource management by these Gentle Giants.

Figure 31 : Elephant calf in forest adjacent crop fields

The herd is expanding their home range almost every year. During our studies to observed that a group reach the extreme end of previous years home range, a group of 3 to 5 elephants move more forward for few days and again join the group in 7 to 10 days. If this group found the place suitable or less resistance, the entire elephant herd move to area in next year where 'observatory group' visited and like this way they are expanding their home range in West Bengal.

12. In 500 words or less, summarize the progress and results achieved. This will be used for media and donor recruitment.

The project site is an ecologically important habitat which link Singbhum Elephant Reserve, Jharkhand and Mayurjharna Elephant Reserve, West Bengal through the Mahilong (Jharkhand) - Kalimati (West Bengal), Chandil (Jharkhand) - Matha (West Bengal); Jhunjhaka (Jharkhand) - Banduan (West Bengal); Dalapani (Jharkhand) - Kankrajhore (West Bengal) elephant migration corridors. The number of elephants in 'Mayurjharna Elephant Reserve' (414.06sq.km.) and extended 'Zone of influence' (1436sq.km) has increased by approximately 67.80% during last 08 years (i.e. 118+ in 2010 to 198+ in 2017). These elephants are sub-divided into 153+ migratory, 17+ Mayurjharna and 28+ residential elephants with several sub groups.

Since July 2016, to reduce HEC and depredation, West Bengal blocks these corridors by 'Energised fence', 'Elephant Proof Trench', human-barrier with fire torches etc. to restrict inter-state elephant migration. This unethical and mismanagement caused limited resource availability to this long-ranging animal and also increased the depredation in the corridor-dependent villages.

This IEF project aims to secure existing Jharkhand-West Bengal Inter-State Elephant Corridors through habitat management, and stakeholders' capacity building for Human-Elephant Coexistence. Prime objective of the project is to find out the ways to mitigate Human-Elephant 'Conflict' in the corridor dependent villages, secure safe passage for the elephants and conduct training programme for villagers to set up a model **'Anti-depredation Squad'**.

During our studies, we found that, Dalapani (Jharkhand)-Kalrajhore (West Bengal) is only active elephant corridor with high priority of conservation. Majority of migratory herds take this route to enter West Bengal. The corridor has more than 37 species of elephant fodder and the forest is a continuous one in entire Jhargram division (Bhulaveda and Belpahari forest range). In 2018 approx, 125+ elephants used the corridor for their to and fro journey. Elephants use Mahilong (Jharkhand)-Kalimati (West Bengal) corridor frequently in post-monsoon to pre-winter. The herd consists of approx 18+ migratory elephants with short home range and Chandil (Jharkhand)–Matha (West Bengal) and Jhunjhaka (Jharkhand) – Banduan (West Bengal) elephant corridors are no longer exists in the West Bengal region.

The project succeeded to remove/make no effective the physical barrier in the inter-state elephant migration corridor in Jharkhand-West Bengal border areas, which facilitate the elephant movements. The community participation in these corridor forest villagers was really appreciable for securing the safe and free passage to the

migratory elephant herds. It is also great news that no retaliatory killing of elephant took place in 2017-18 (till March). During the return journey, we estimated 11 calves with the herds which also indicate that the natural condition is favourable for elephants in the project site and extended home range.

The community capacity building programme conducted till date were focussed on HEC mitigation techniques like low-cost crop-guarding system, fore-alarm system, alternate livelihood practices, crop alteration, save period of cultivation of cash crops, unpalatable long-awned (bristles) paddy, chilly etc. through training and field verification in corridor dependent villages to mitigate human elephant hostility. Several awareness programmes and capacity building programme for villagers were conducted but the villagers were not fully convinced to replace their traditional crops and other practices.

The project also played a good role in communication and confidence building of stakeholders which helped to minimise the retaliatory attitude. We have formed the Anti-depredation Squad of 45 people and supported the Anti-depredation Squad by donating shoes, rainsuits etc. and equipments.

We have done a baseline survey of the corridors and interacted with the adjacent villages during sensitization and capacity building programme. We also communicated with forest managers and local villagers and explained 'how we can change the conflicts to coexistence' through few precautions and activity. We also requested them to give free passage to the elephants. Finally, the physical barriers from the inter-state border had been removed and the safe passage was given to the migratory elephant herds.

We have enumerated the elephant population in project area through direct sighting and fixed point count (waterhole techniques). The enumeration of resident elephant and their home range marking is not done completely as it requires visiting entire home range which is outside the corridor forests area. We have also documented the fodder species available in the corridor forests.

We are also developing local conservation stewards through several capacity-building programme for local young people in colleges, high schools and villages. They got a basic training on monitoring the elephant population migration and human-elephant hostility in their locality.

13. In 50 words or less, summarize the progress and the results achieved. This will be used for social media.

The barricades to prevent elephant migration from neighbouring states in four inter-state elephant migration corridors which link Singbhum Elephant Reserve, Jharkhand

and Mayurjharna Elephant Reserve, West Bengal made free now. In 2017-18 we experienced the maximum stay period of elephants in West Bengal but we achieved 'ZERO' retaliatory killing of Elephants. We conducted capacity building programmes for villagers and set up 'Anti-depredation Squad' to safeguard the villages and secure the safe passage to the migratory elephants.

14. List of organizations associated with this project and their roles in the project.

Associated Organization	***Role***
National Council of Science Museum, Govt of India	1. Community capacity building programme and training of volunteers.
Directorate of Forests, Government of West Bengal.	1. Supporting the conservation project through knowledge sharing, two wheeler motorbike, infrastructural supports and providing local staffs.
The Central Rice Research Institute, Orissa	1. Knowledge sharing about the unpalatable long-bristles paddy varieties.
Local cable channels, FM radio, electronic and print media	1. Awareness generation among local people and other stakeholders. 2. Publicity of project in local areas.
Vivekananda Institute of Biotechnology	1. Development of agricultural planning according to elephant migration calendar. 2. Resource support for alternate livelihood development.
Local NGOs	1. Network with the stakeholders and participate in the awareness and capacity building programmes.
Undergraduate colleges under Calcutta University, Burdwan University and Vidyasagar University.	1. Capacity building programmes for students and engage them as volunteers in the conservation project.

We have already contacted the following organisations/institutions and will get their response after submission of the latest project report:

1) Asian Elephant Specialist Group, IUCN.

2) Project Elephant, Government of India.

3) Ministry of Environment, Forests and Climate Change, Government of India.

15. Financial report of International Elephant Foundation funds spent.

BUDGET ITEM	IEF Grant	Expenses	Balance Required (+unspent)	Comment
Staff costs	$2340	$2340	-	-
Travel expenses for survey, networking and capacity building,	$1200	$1470	(-) $270	The sudden hike of fuel prices increased the travel cost. This (-) $270 deficit expenses was spent from unspent grant for boarding and meal.
Boarding and meal cost during field survey, awareness etc	$2400	$2133	(+) $267	Forest department and local NGOs provided meals and accommodation in two locations at a concessional rate or free of cost.
Equipment	$650	$373	(+) $277	Bushnell6x50 Equinox-Z Digital Night Vision Monocular was not available in market. We have purchased two sets of binocular and one high power searchlight by the unspent money.
Supplies (Consumable) Seeds/plants from nursery for fodder and indigenous species plantation. Printer cartridge, paper, power cells, candles, rope etc.	$600	$656	(-) $56	Proposed fodder species plantations objective was not achieved as planned due to low rainfall in beginning of the season and later the flood in the area. We need more season or year for the plantation work.

Services (itemize) Communication and awareness materials and evaluation of community attitude and Human-Elephant Interaction intensity. Accidental insurance for 'Anti-depredation Squad'	$1275	$1273	(+) $2	Communication and awareness materials were circulated and distributed among children, students and villagers etc. The project evaluation of community attitude and HEI intensity is ongoing. Accidental Insurance for 'Anti-depredation Squad' was not done by us for this year as the government has declared the same idea for the ERS. .
Workshop for capacity building	$1000	$1123	(-) $123	Community capacity building workshops were more in number as requested by the people, NGOs and forest department. The seminars in colleges/universities were supported by them but we conducted several seminars in school with the IEF grant.
Miscellaneous expenses Inception and follow up meeting with local stakeholders group, press meet etc	$500	$627	(-) $127	Inception & follow up meeting with stakeholders group is ongoing as per schedule. We are going release the publicity materials for media in a meeting a day celebration on

				12th August 2017.
TOTAL	**$9965**	**$4188**	**(-)$30**	**The deficit was spend from the fund received from others NGOs**

Total project budget: $9965

Amount spent: $9995

16. Submit at least five high resolution digital images (350kb or over) representative of the Project as separate individual files. Please include at least one photo with an elephant in the frame that demonstrates your project activities.

Serial number of the image	Description
Image 01	Image 01_ The elephant heard is moving through corridor village at 2.30 am. (Photo credit_Samya Basu)
Image 02	Image 02_The tusker elephant guarding the herd during migration at Arabari (Photo credit_Samya Basu)
Image 03	Image 03_EPT or Elephant Proof Trench to resstrict interstate migration of elephants from Jharkhand to West Bengal (Photo Credit_Samya Basu)
Image 04	Image 04_ The loner elephant is following its group at 3.30 am (Photo Credit_Samya Basu)
Image 05	Image 05_Tusker elephant blocked the road to give passage to the herd (Photo credit - Samya Basu)
Image 06	Image 06_Vehicle of 'Anti Depredation Squad' of forest department (Photo credit - Samya Basu)
Image 07	Image 07_Rainsuit donated to Anti-depredation Squad. (Photo Credit_Samya Basu)
Image 08	Image 08_Elephant herd is crossing the paddy field without any obstruction (Photo credit_Animesh Mahato, Field Staff)
Image 09	Image 09_Anti-depredation Squad in Dalapani-Kankrajhore Inter-state Corridor (Photo credit - Samya Basu)
Image 10	Image10_Tribal woman killed by elephants in early moring during NTFP collection. (Photo credit_West Bengal Forest Department)
Image 11	Image 11_House damaged by residential elephant in Kalimati region (Photo Credit_Chittaranjan Mahato)
Image 12	Image 12_Student training programme in collaboration with DSC (Digha), Ministry of Culture, Government of India (Photo

	Credit_Samya Basu)
Image 13	Image 13_Residential elephant entered into the city (Photo courtsey_Durgapur Forest Division)
Image 14	Image 14_Samya Basu and forest managers during 'All India Synchronised Elephant Population Estimation' (Photo credit - West Bengal Forest Department)
Image 15	Image 15_Stray Tiger in the South West Bengal region of elephant habitat for the first time in local history.

17. Submit at least one video clip.

Serial number of the video	Description
Video 01	Video 01_Teasing the wild elephant herd (Credit - Anonymous)
Video 02	Video 02_Elephants moving from encroached forest land (Credit - Dilip Mahato)
Video 03	Video 03_Elephant migration at midnight (Credit - Samya Basu)
Video 04	Video 04_A day with 'Anti-depredation Squad' in search of elephants (Credit - Samya Basu)
Video 05	Video 05_Right of Passage *

*Will be edited for better narration of the incidents.

18. Do you intend to publish and/or present your findings at a conference or symposia?
Please provide us information about the journal/conference/symposia and a timeframe. Please send a copy of all future publications that result from this study.

Yes. I will definitely share the project findings through publication in leading journals and interactive audio-visual presentation in conference, seminar etc. The project work and findings has already been presented in different seminars organised by institution under Ministry of Culture, Government of India, University Grants Commission (Government of India). Apart from that the project findings and recommendations were given to Forest Department, Government of West Bengal.

The complete presentation will be distributed to all stakeholders group in a DVD format along with awareness materials.

19. Please list all websites, blogs, social media accounts, etc associated with the project, its investigators, and organizations (this includes Facebook, Twitter, Instagram, etc)

Earlier we did not have the websites, blogs, social media accounts but recently we have started a free Website and Facebook, Twitter, Instagram, YouTube accounts to share the activity with public from shortly.

Website: Not yet done due to some technical problem. The website will be available by 12th August 2018.

Facebook: **www.facebook.com/aecfindia**

Twitter: **https://twitter.com/elefriendsamya**

Instagram: **https://www.instagram.com/samyabasu**

YouTube: **https://www.youtube.com/watch?v=AvLQ-76SgbY&feature=youtu.be**
https://www.youtube.com/watch?v=I8JJr7YJcmY
https://www.youtube.com/watch?v=uKj4ksuJ8dg&feature=youtu.be
https://www.youtube.com/watch?v=D70bWIYZgww&feature=youtu.be
(many other link is available in YouTube)

For further details, please contact:

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The Elephants are in our religious culture.

We worship Elephants as Deity in India.

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