

A rapid-survey report on the status of Human-Elephant Conflict (HEC) at a Private Farmland in Gonmaknahalli Village abutting Anchetty Range (Hosur Forest Division – Tamil Nadu)



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Background:

The private land area that was surveyed was owned by Mr. Ajay Thambi since the last 4 years. The village of ‘Gonmaknahalli’ is situated on the western margin of Anchetty Wildlife Range of the Hosur Forest Division. The neighbouring villages of Arulalam, Kundukottai, Shivnahalli and several ‘kottais’ or hamlets which share close proximity to the reserve forest areas towards the east of the Manchi and Poni Reserve Forest Areas.

The predominant lifestyle and employment practises included agriculture and livestock rearing. Crops cultivated in the surrounding area include seasonal and annual crops such as *bitter gourd, bengal gram, double-beans, finger-millet, coconut, castor, sorghum, tomato, cabbage, horse gram, banana, mango, papaya, tamarind* and *cattle grass*. The proposed land area is surrounded by forest area onto its south east and south west margin making it appear semi-enclosed by forest. The present survey was undertaken to ascertain the status of human-elephant conflict in the proposed land-area and to suggest sustainable mitigation practises to ensure lower conflict levels. The area was found to be congenial for elephant-activity due to high presence of elephant-usage signs, such as defecation signs, track signs and feeding signs. It was also established that the semi-permeable fencing such as the bard-wire-pillar fence had breakages at different locations largely concentrated towards the forest side on the East indicating elephant invasion into the land-area. The local communities have faced high depredation caused by elephants in this area since the last decade and have succumbed to severe losses to life and property due to this onslaught caused by elephants. Villagers use the forest on a daily bases for livestock grazing, collection of minor forest produce (Tamarind) and fuel food for cooking. It is evident that people and elephant live in close proximity owing to the geographical position of this landscape and the high dependence on the forest by these communities for their livelihood practises.

Materials and Methods:

The survey was conducted by a team of three researchers with the help of a local (Mahadeva) which followed the trail method of sampling. The boundary of the 4.5 acre was surveyed for the assessment of breakages in the semi-permeable fencing. A parallel survey attempt was made to assess the status of habitat-usage of elephants within and at the periphery of the land area abutting the forest. This rapid-survey was conducted on the 12th February 2015 between 17:00 to 20:00 hrs. The forest is situated in close proximity to the study site towards its East. The landscape elements around the study area included water bodies, bamboo thickets and sheet rocks which was found ideal for the ecological need of elephants. This survey was extended into the forest area upon the consent of the local guide to establish the movement patterns of elephants along the forest boundary. *Mallige Gowdru Kere* 2km (approx.) away towards the east of the study area was established as one of the hotspots for elephants as it is assumed to be the closest natural water source for animals in the vicinity and depicted high usage based on indirect and direct evidences of animals.

Results and Conclusion:

Based on the outcomes of survey, it was established the crop-raiding by elephants is an annual phenomena in the proposed study area and has been an escalating concern for the locals (**Figure 1**) The average distances from the study area to the forest zone was found to be 140m, 170m and 1000m indicating close proximity.

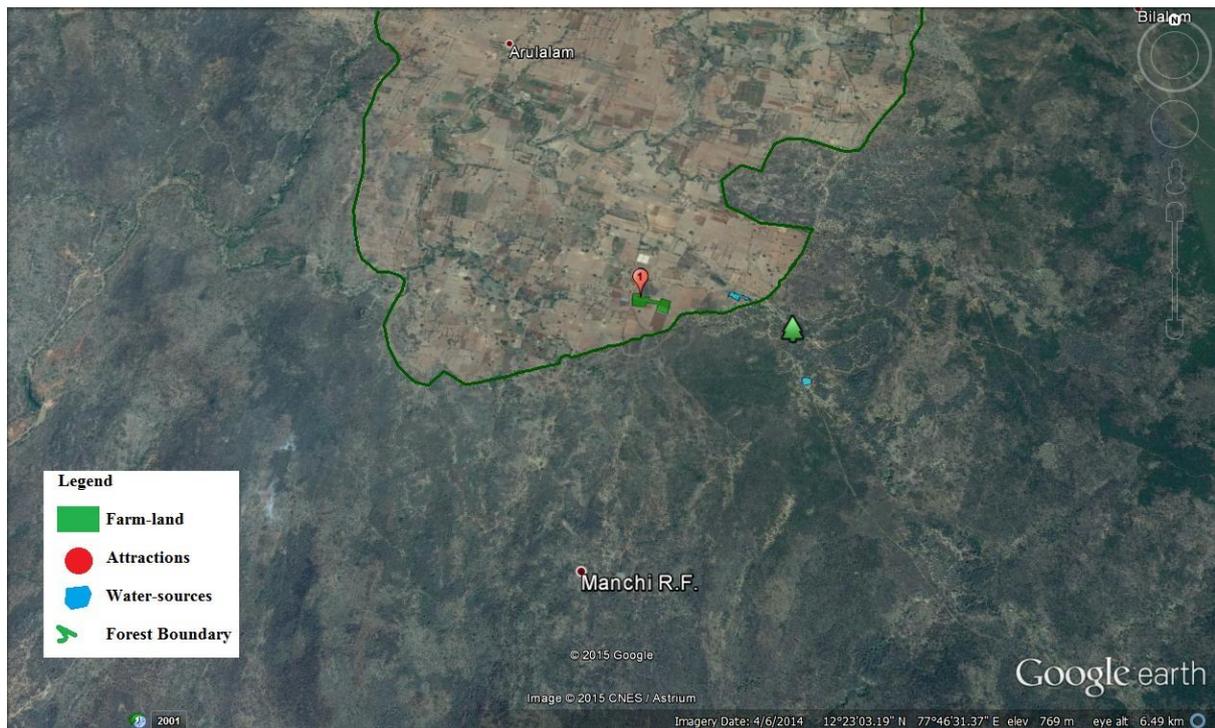


Figure 1: Map showing the study area with respect to the landscape.

The land area comprises of total area of 5 acres out of which *Bringal* and *Cherry-tomato* has been cultivated 1 acre and 1.5 acres respectively during the study period. (**Figure 2a**) The crops that were damaged by elephants in the land area included cherry tomatoes mostly due to trampling.



Figure 2a: Crops such as bringal and cherry tomatoes cultivated in the study area

The semi-permeable barrier **viz.** the barb-wire pillar fence proved ineffective to curtail elephants and had 7 breakages (**Figure 2b**) in two encounters of elephants.



Figure 2b: Breakages in the barb-wire fencing around the farm-land

The temporarily established Chilli-Tobacco Barrier (CTB) * (* A non-invasive elephant barrier mechanism pioneered by A Rocha India at Bannerghatta National Park using a mixture of chilli-tobacco to deter elephants from entering farmlands) was found to be ineffective and status of the erection was found to be weak as the smear had worn off. The average length of the CTB was estimated to 195m established in semi-box (**Figure 3a and 3b**) fashion and was found to be not re-smearred since its inception 8 days ago prior to the current survey.



Figure 3a: Map depicting the spatial alignment of Chilli-Tobacco Barrier in study area



Figure 3b: The status of Chilli-Tobacco Barrier in study area

Towards the eastern side of the proposed study area abutting the forest was conflict prone due to the presence of a large water body outside the elephant boundary but within the forest boundary. This can be established due to the disparity created by the forest department and local communities that by virtue of establishing an Elephant-proof Trench (EPT) towards the eastern side to regulate elephants proved faulty in its construction. The EPT had the following dimensions Top-Width (TW) = 2m / Bottom Width (BW) = 1m and Height (H) = 2.3m was assumed to be very porous due to the construction site being loosely soiled and water-logged. **(Figure 4)** Along the EPT, 4 recent breakages were established within an average distance of 400m of the EPT length indicating an effective and weak barrier.



Figure 4: Elephant Proof Trench (EPT) constructed by the Forest department

There were no other barriers established by the locals of the forest department in the survey area. It was also established that two exit points (**Figure 5a and 5b**) were favouring the movement of elephants from the forest side into the croplands and to the study site one of which was (Bridge) was artificially created for human-use and venturing into the forest and the other was an old breakage in EPT near the water logging site which was excavated by the locals has now become a prominent exit point. The excavation of soil from the EPT was assumed to be done by locals due to the ineffectiveness of the forest department and hence done to prevent elephant exiting from the forest due to its execution errors elephants have loosed the soil in the trench to create a pathway for their exit.



Figure 5a: Top: Elephant exit point 1

Figure 5b: Bottom: Elephant exit point 2



The water body adjacent to the farmland depicted high elephant usage based on a cluster of 8 dung-piles displaced with an area of 200m² during the study period and the status of dung was found to be very fresh (1 day old or 36hrs). The dung contained traces of jackfruit seeds indicating crop-raiding tendencies (**Figure 7**).

A survey at the Malligowdru Kere witnessed a sighting of 5 elephants (2 Adult-Females, 1 Sub-adult female, 1 Juvenile Female and 1 calf (UK)) (**Figure 8**) belonging to a herd that has been causing conflict in the surrounding area as ascertained by the local tracker.

Figure 7: Fresh dung bolus of elephant.





Figure 8: A herd of elephants sighted at Malligegowdru kere

It was also stated by locals that a lone-bull (male-tusker) was found to be associated with the observed group that has been causing severe conflict in the villages of Shivanahalli and had killed one-middle aged man a few months prior to the survey. It was also noticed that the herd of elephants were drinking water from lake but were chased by the local minor forest produce collectors in the fear of retaliation. Hence it can be concluded that anthropogenic disturbances are high in the forest area as well.

Based on the discussions with locals, Mahadeva and Ravi from the neighbouring villages it was established that status of human-elephant conflict in the study area seems to be an escalating concern for the communities living in the current landscape, it was also arrived at that mitigation practises such as active driving of elephants using crackers, torchers are temporary and passive elephant barriers such as EPT's, CTB's and other semi-permeable barriers are proved to be infective in this region. Hence in coherence with our findings it can be established that in order to mitigate conflict in high-elephant density areas foolproof

mitigation measures need to be considered coupled with sensitisation of local communities in order to increase their tolerance levels which will aid in successful mitigation attempts at an indigenous level.

Recommendations:

1. Use of Solar powered electric fences in the study area as a foolproof mitigation measure. **Option 1 (Figure A)** is to cover the entire perimeter of the 5 acre of the land with solar fencing and run it annually between the late-evenings to early mornings. **Option 2 (Figure B)** is to cover the entire perimeter of the cultivated area within the land area with solar fencing and run it thought-out the cropping season (only) between late-evenings to early mornings.

FigureA: Total length of barrier required 740m

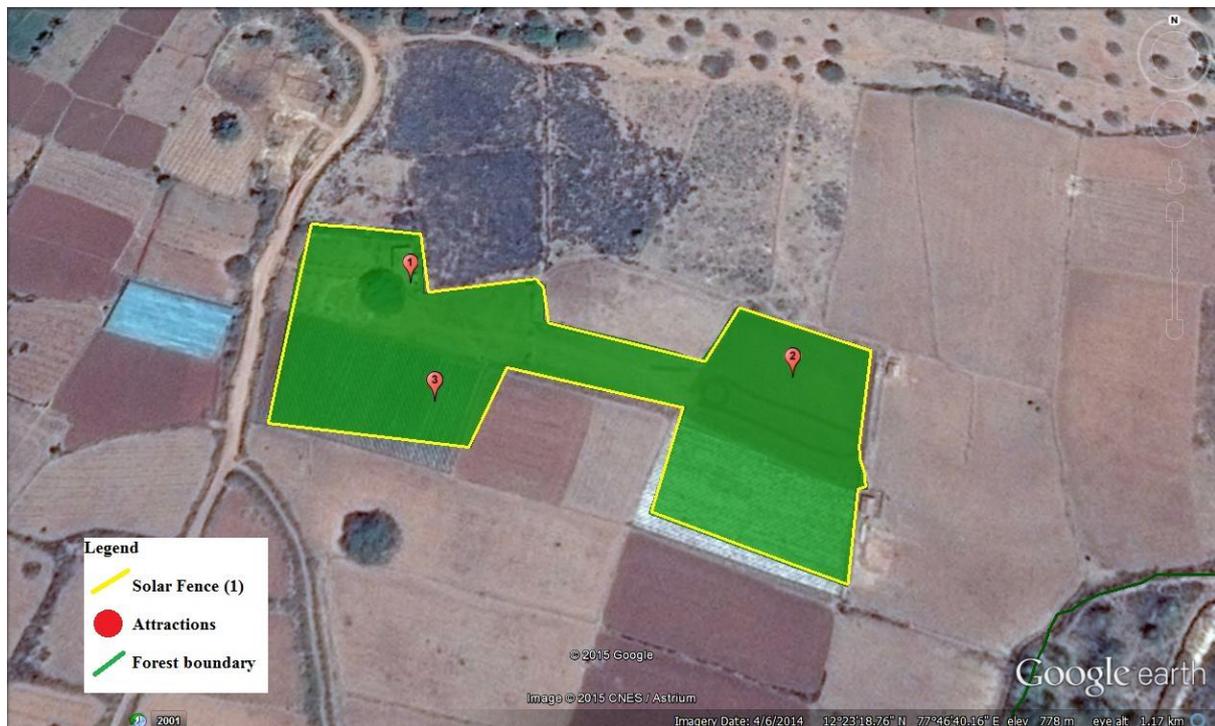
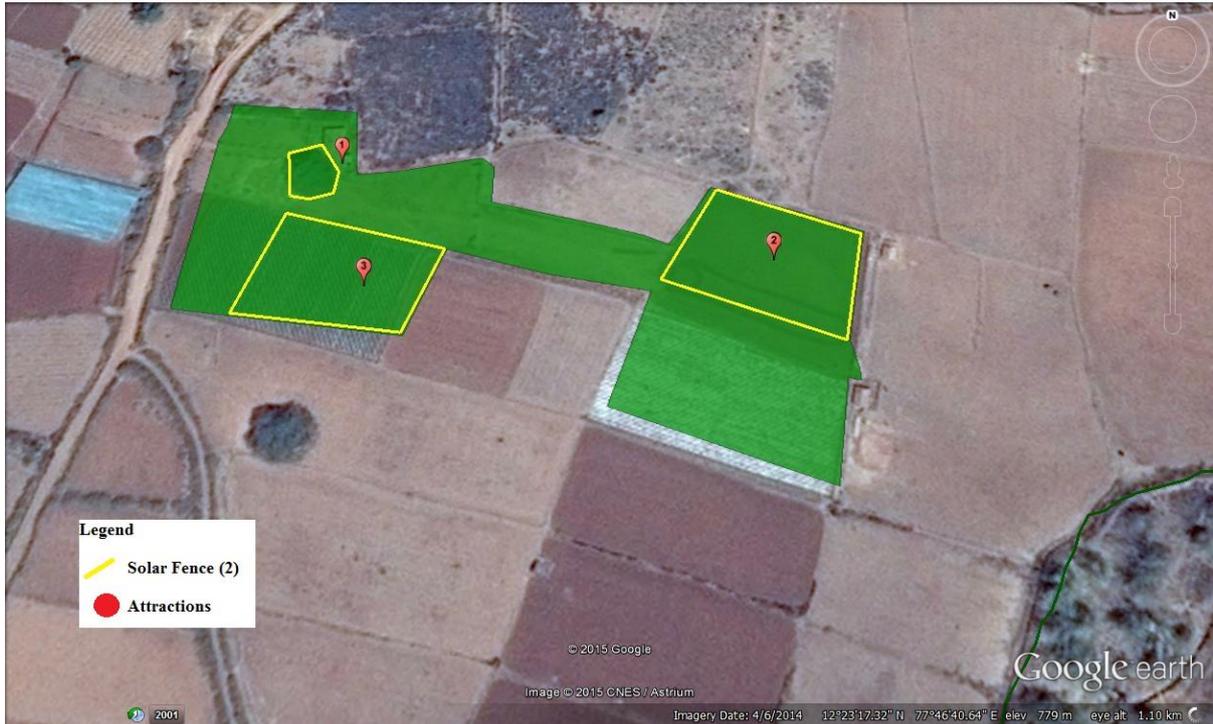


Figure B: Proposed Solar fencing to be established only around attractions for elephants



2. To establish an elephant, driving and observation post within the land area in the form of a machan or tree house to detect early arrival of elephants and drive them away using crackers or sounds.
3. To establish an elephant proof trench with dimensions; TW: 3m, BW: 1.5m and H: 2m on the North side to prevent elephant incursions. **(Figure C)**
4. To practise alternate agricultural practises cultivating crops that are not fit for consumption by elephants such as agro-forestry produce like Teak and Eucalyptus done by adjoining farm-owners.
5. To reconstruct the currently existing EPT's on the forest side with support from forest department and local panchayatis in order to minimise any execution errors. The frequent elephant hotspots identified need to be sealed and made foolproof. Construction should be supervised by an expert.



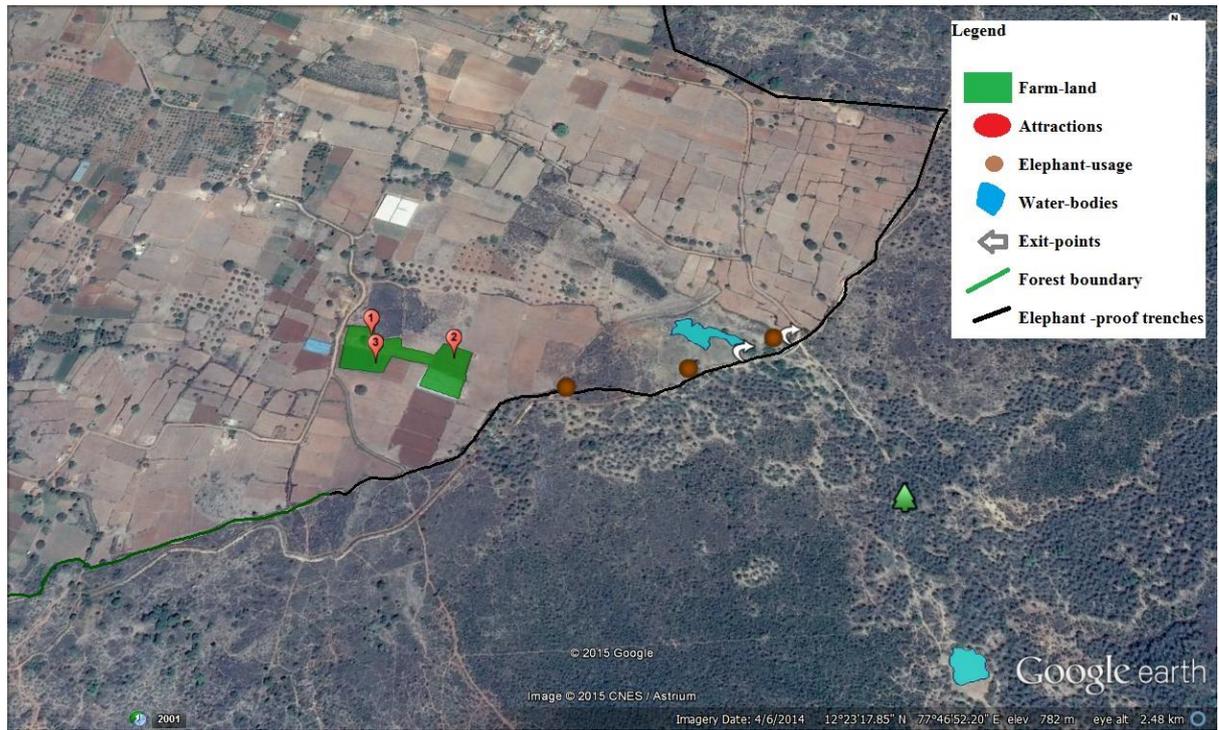
Figure C: Proposed Elephant Proof trench to be constructed.

6. To establish test plots for CTB's in around the local croplands to test its efficacy on a seasonal and temporal basis, in order to raise capacity building of local communities in participatory elephant mitigation methods.
7. To conduct studies on movement and seasonal habitat usage patterns of elephants on a spatio-temporal scale done in collaboration with the Forest department and other stakeholders in order to ascertain elephant presence and usage in this landscape more robustly.
8. To aid efforts by the local communities and forest departments in human-elephant conflict mitigation measures and bring it under a research and education model in order formulate future stewards for conservation and human-animal conflict mitigation in the region.
9. Due the short-coming of the duration in the present study the current findings is assumed to vary temporally hence an intensive survey using suitable methods is to be conducted using different teams and resources in order to establish robust information



in addressing some of the conservation and communal challenges on a long-term basis.

A spatial-representation of status of landscape with regard to the study



Landscape-view

Pictures from the field:

