

**Ecology of elephant (*Elephas maximus*) in South-West Bengal
including population dynamics, migratory pattern, feeding
habits and human-elephant conflict**

Project Final Report

June 2019



Sálim Ali Centre for Ornithology and Natural History

(A Centre of Excellence under the Ministry of Environment, Forest
and Climate Change, Govt. of India)

Anaikatty Post, Coimbatore-641108, Tamil Nadu



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Submitted to

West Bengal Forest and Biodiversity Conservation Society

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Executive summary

In the recent past, range expansion of Asian elephant was noticed in South West Bengal from the Dalma Wildlife Sanctuary in the adjoining state of Jharkhand. Now, elephants almost have become residents and their increased presence in the landscape of South Bengal has led to severe human-elephant conflict. Thus, to understand the ecology of elephants and their issues in South Bengal to provide inputs to conservation action plan, we conducted this study with the following objectives: 1) study the elephant ecology including the demography, population trend, migratory pattern, resident population movement patterns, elephant corridors, and habitat utilization, 2) study the habitat of Mayurjharna Elephant Reserve in South-West Bengal and assess its carrying capacity and develop an Elephant Management Plan for the South-West Bengal including Mayurjharna Elephant Reserve, and 3) study and analyze the human-elephant conflict in South-West Bengal including preparation of conflict map and suggest mitigation measures to minimize the conflict.

The understanding of the vegetation and its probable effects on the fauna in an area is a requisite for appropriate conservation and management plans. Our findings in South Bengal and the Mayurjharna Elephant Reserve (Mayurjharna ER) show that *Shorea robusta* is the most dominating species in the landscape. The practice of monoculture of *S. robusta*, for timber, have decreased the diversity and species richness in the forests and that has a major impact on the natural habitat of elephants making them stray out to agriculture fields and human habitations.

The movement of elephants from Dalma Wildlife Sanctuary towards the Mayurjharna ER due to severe land mining in the latter has increased considerably in the last few decades. Elephants, which were earlier confined to certain pockets of Mayurjharna ER, have now expanded into the other parts of South Bengal i.e. Medinipur, Kharagpur, Jhargram, Rupnarayan, Panchet, Bankura North and Bankura South forest divisions. Despite the absence of continuous forest patches, the expanse of the area utilized by the animals has increased. The presence of ample land under agriculture to feed on has lured the elephants in this region, and though the movement is restricted to specific areas, the time spent there has increased due to the barricades erected by the Odisha government along the borders.

Population estimation was made using two field techniques including dung count survey (Rupnarayan and Medinipur Forest Divisions and Mayurjharna ER) and distance sampling (Mayurjharna ER). Dung count survey in Rupnarayan and Medinipur forest divisions and in Mayurjharna ER provided the density of 0.518 () and 0.003 elephants/ km² respectively. In Mayurjharna ER, density could not be estimated due to no detection of elephants despite 620.40 km of transect walk in the ER. The elephant population in this area is on a continuous move and shows unnatural movement as they are being regularly driven out for long distances, and that makes estimating their populations using the above two methods all the more difficult. However, a good number of immatures in the population indicates that the population is reproductively fit and thriving in the area.

The identified elephant herds (Herd-1 and Herd-7) were followed between August 2017 and December 2018 and their habitat use and feeding ecology were documented. Although elephants spent daytime in the forest that is usually close to the agricultural fields, they stray out at night to agriculture fields for crop raid. The high presence of crop species in their diet revealed their dependency on agriculture and the lack of adequate fodder species in the forests. The agricultural crops, being rich in nutrients, are preferred by the elephants despite the high risk of human interactions. The natural movement of elephants is highly influenced by the *hula* drives and the local drives conducted to reduce the crop depredation by elephants, thereby completely altering their natural movement pattern.

Conflict in south Bengal is inevitable due to the lack of continuous and sufficiently rich forest patches and the vast expanses of preferred agricultural land. Thereby, a high number of human deaths and injuries occur in non-forested areas. Continuous driving of elephants agitates and irritates them and that leads to more conflicts. Medinipur forest divisions suffered maximum in terms of loss of human lives due to restriction of movement of elephants to other areas by barricades, thus forcing them to limit their natural tendency to move out and agitating them leading to more human-elephant conflicts. The retaliatory killing of elephants either by poisoning or electrocuting is common in the area for the excessive human life and the economic losses incurred due to elephants. The livelihood of the local people is dependent on the single crop that they grow in a year. If the elephants depredate on their cropland, which is a major reason for people there not to accept elephants in their agriculture fields since these animals

make their survival difficult. Although they have respect for the animals, the loss incurred overrides their sympathy for it.

The carrying capacity for any region provides us with the equilibrium between population of a species and its resources in an area and the same was also assessed for Mayurjharna Elephant Reserve.

The study area is a fragmented landscape dominated with sal trees with very sparse population of fodder plants for elephants, and the unusual and violent behaviors of local people are the inherent constraints to hold the elephant population in South Bengal.

The present study hereby provides detailed information regarding their population structure, movement pattern, the dependency of these animals on agricultural crops to gratify their dietary requirements, problems of increasing conflict issues in the area and the management possibilities in the landscape of South Bengal including Mayurjharna ER.