

## Final Destination: Range Expansion and Behaviour of Asian Elephants in Northern Western Ghats, India

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### Introduction

There are no historic records of permanent presence of Asian elephants (*Elephas maximus*) in any part of Maharashtra State. The last decade, on the contrary, has seen herds of wild elephants from neighbouring Karnataka State settling in south-western Maharashtra. Since 2005 the influx is continuous and elephants seem to have become resident in Dodamarg and Kudal of Sindhudurg District, and Ajara and Chandgad of Kolhapur District. The elephant population in Sindhudurg use specific areas of their range more intensively than earlier years (Fig. 1). The elephants also prefer well-known routes with frequent visits to areas with which they are accustomed. Human-elephant conflict (HEC) has created much hue and cry at socially and politically since people previously had not experienced elephants at close quarters.

### Changing habitats

Though Western Ghats lost its forest cover by 40% during 1920 to 1990 (Menon & Bawa 1997), it harbours around 10,000 elephants, distributed in six different populations. In Northern Western Ghats, roughly 5000 km<sup>2</sup> of habitat of North Kanara provides shelter to 50 animals (Baskaran 2013).

Existing protected areas (PAs) of south India are invaded by *Lantana camera* and *Eupatorium odoratum* (Baskaran *et al.* 2010). Allelopathic effect of *Lantana* hampers the growth and vigour of native plant species together with increased hazards of forest fires (Prasad 2008). Combined effect of cattle grazing and invasive plants in wildlife reserves adversely affects resource availability. Reduction in forage

grounds adversely affects the habitat use by wild herbivores including elephants (Prasad 2008), which might be responsible for drawing elephants out of PAs.

Asian elephants attain highest densities in moist and dry deciduous forests that contain substantial grass and bamboo forage (Milroy 1922; Mudappa & Shankar Raman 2012). Availability and extent of bamboo may influence habitat use strategies by elephants (Baskaran *et al.* 2010). Mangaon valley and Tilari catchment area in Sindhudurg District have extensive natural regeneration as well as plantations of bamboo, which may act as a temptation for elephants. Analysis of four dung piles collected in 2012 - 2013 from different places in Sindhudurg, revealed that elephants relished bamboo. There are many families in this area selling Manga bamboo (*Dendrocalamus stocksii*), as the major source of income. Unfortunately this crop has no place in the list of ex-gratia payments given by the Forest Department for crop damage.

Changing land use patterns, fragmentation and loss of habitat (Riddle *et al.* 2010), construction of



**Figure 1.** Asian elephant habitat in Sindhudurg District (*Caryota* palms).

dams, open mining, and increase in commercial plantations (Mehta & Kulkarni 2013) give rise to HEC in Sindhudurg District. In addition, poor application of mitigation methods due to poor understanding of HEC and elephant behaviour besides inability to take an adaptable approach are at the roots of failure of elephant-human coexistence.

### Elephant behaviour

HEC represents inter-species competition for resources (Sitati *et al.* 2003). Elephants in newly occupied areas, fragmented with human settlements increase instances of crop raiding (Rood 2008). Elephant activity in Sindhudurg seems to be continuing throughout the year. However it is governed by the stage of crop maturity (Gubbi 2012). Young green and growing plants are far more nutritious than full grown, dead or dormant ones and are particularly high in protein content (Schaller 1998). Elephants feed on apical meristems of coconut palms (Fig. 2), and soft stem tissues of banana stem and fishtail palms. They have never been seen to feed on un-ripened banana fruits. They peel off and eat the bark of teak trees. Elephants are attracted to the smell of freshly harvested paddy locally called 'sal'. They break open doors and earthen walls of granaries in the Mangaon area in Kudal Taluka.

Since cultivated crops are more palatable and nutritious than wild food plants, male elephants seek extra-nutrition by crop-raiding with the result of increased conflict with humans. Such inherent risk-taking of elephants adversely influences elephant-human interrelationships (Sukumar 1991; Hoare 1999; Gubbi 2012).



**Figure 2.** Intensive damage to coconut orchards by elephants in Sindhudurg District.



**Figure 3.** Solitary tusker in Naneli village, Kudal taluka, Sindhudurg District.

Elephants use forest patches as shelter during day time (Fig. 3) and venture out for feeding on agricultural crops during night and early morning hours in adjoining villages, suggesting that offenders seek to minimize the associated risks (Hoare 1999; Sitati *et al.* 2003).

### Conflict-mitigation measures

From January 2002 to July 2014, HEC resulted in the death of 14 elephants and 13 humans in Maharashtra State (DFO Sawantdadi, 2014). The Forest Department has constructed elephant proof trenches (3.27 km), solar fencing (39.51 km), Iron post hurdles (27.7 m) and stone wall fencings (37 m) along the passage between Karnataka and Maharashtra (DFO, Sawantwadi, 2008-09). Villagers use various indirect measures like shouting, lightning fires, beating drums, cracking fires etc. to keep away elephants from agricultural fields. Practicality of preventive measures like chilli ropes, electric wire fencing, and burning chilli-mixed-dung had also been tested, but elephants get habituated towards them (Zimmermann *et al.* 2009).

Dug trenches are completely ineffective in hilly and high rainfall areas like Sindhudurg. 'Chilli fences' have potential to reduce elephant crop raiding, but their effectiveness could diminish with dew and rains (Chelliah *et al.* 2010). African elephants learn to walk parallel along the chilli-ropes and enter the fields where the rope ends (Chelliah *et al.* 2010). Forest departmental personnel had witnessed an elephant throwing

an uprooted tree over electric fence wires. Electric wire fences are seldom effective (and more expensive) for farmers with marginal land holdings. High power hand-held spotlights are used as an effective and popular measure.

### Suggestions for future actions

Exploitation and degradation of natural habitat along with interspersed human settlements represent potential conflict areas (Kulkarni *et al.* 2008). Intermediate level of habitat fragmentation does not displace elephants from their natural ranges (Rood *et al.* 2008). Thus habitat assessment outside the conventional protected areas is necessary. Assessment of health, dietary status and the movement patterns of wild elephants in this newly expanded range is essential to generate reliable baseline data. Use of satellite telemetry (radio collaring), could map ranging behaviour of elephants. It can also be useful to study the spatio-temporal relationships between human settlement configurations and problem elephant activity.

Establishment of a separate wildlife wing to Sindhudurg District must be a priority for Forest Department. Forest Departmental staff should be well trained and well equipped with necessary tools, equipment and infrastructure facilities for the satisfactory management of wildlife.

Farmers in and near forest edges should be provided training to guard their fields at night. Wild elephants get aggressive if they sense the presence of dogs in the vicinity, but farmers can still effectively use them as a traditional security alarm.

Co-existence with elephants should be promoted. Visual tracking of wild elephants through involvement of local people is an effective way to draw up a long-term conservation program and is the key factor in the successful “Assam Haathi Project” (Zimmermann *et al.* 2009).

Although elephants have accepted this habitat, it is necessary to protect it and extend it towards existing protected areas by creating viable corridors. Creating private sanctuaries

could be possible. Forest cover of Kolhapur, Sindhudurg, Belgaum and Uttara Kannada Districts and part of Goa State conjointly possess immense potential to support a viable elephant population (Sarma & Easa 2006). Sindhudurg District has 89 % of the total forest area under private ownership (DFO Sawantwadi, 2014). The Government of India does not provide any legal or physical protection to such land, but an important amendment introduced by the Wildlife (Protection) Amendment Act of 2002, has agreed to protect communally owned areas of ecological value.

Siju-Rewak corridor in the Garo Hills and Tirunelli-Kudrakote corridor in Kerala are the best examples of private wildlife corridors established for migrating elephant herds. For that the financial assistance is provided by World Land Trust and Wildlife Trust of India. It can also be helpful for community based ecotourism and could be linked with the welfare of local people so that they can directly contribute to the conservation of elephants.

The above suggestions should be buttressed with financial resources, political will and public support. Accepting the presence of elephants is a better approach for finding solutions and minimizing HEC with ultimate objective of conservation of wildlife. Management strategies such as translocation of elephants (Fig. 4) or re-settlement of people from one place to another will not be effective since these are temporary solutions.



**Figure 4.** Capturing and domestication of elephants in Kudal taluka, Sindhudurg District.



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