

## Assessment of Response of Elephants to Beehives Placed in a Paddy Field

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### Introduction

India, with an estimated elephant population of 26,000 to 30,000 elephants supports over 60% of the global Asian elephant population (Riddle *et al.* 2009). Habitat loss and fragmentation, human elephant conflict, and poaching are the major threats to elephants in India.

The Coimbatore Forest Division covers an area of about 694 km<sup>2</sup> and forms the southern part of the Niligiri Biosphere Reserve. It is divided into six ranges: Sirumugai, Mettupalayam, Karamadai, PN Playam, Boluvampatty and Coimbatore. Human-elephant conflict is a major problem over much of the Coimbatore Forest Division with damage to crops, human deaths and injury (Thirunavukkarasu 2012). Even though preventive measures have been taken by the government and farmers, human-elephant conflict persists. Around 77 humans were killed in Coimbatore Forest Division from 2000 to 2012 of which 17 persons were killed in 2011 (Thirunavukkarasu 2012). There were 4 human deaths and 1 injury in the Anaikati hill (Coimbatore Forest Range) within five days in January 2013. Crop raiding by elephants is frequent in all the ranges.

Beehive fences have been proposed as a human-elephant conflict measure (King 2010). In this study we assessed the response of elephants to beehives placed in a paddy field.

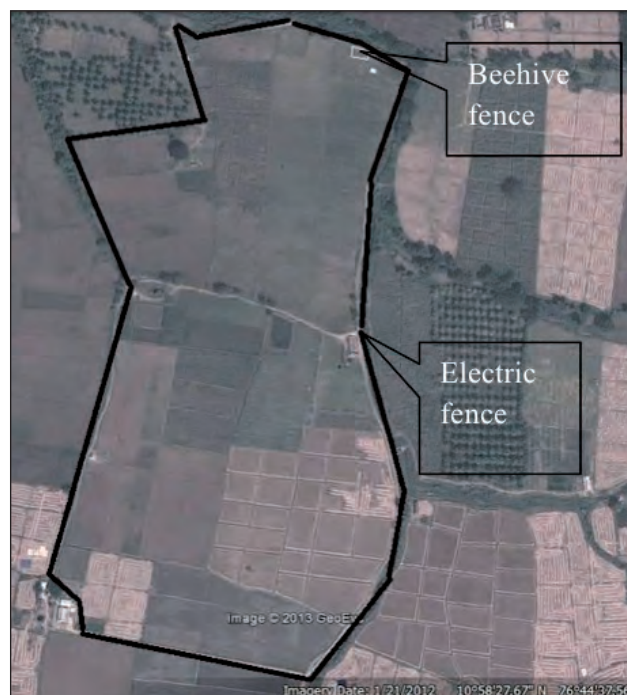
### Methods

The study area, Muttathuvayal farm land falls between 10058' 27.67" N and 76044' 37.56" E in the Boluvampatti Forest Range, located in the

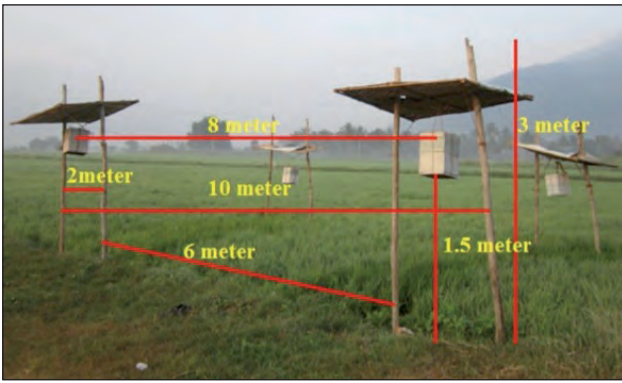
foothills of Western Ghats about 35 km west of Coimbatore.

The beehives were placed at one corner of a 5 acre paddy field ( Fig. 1) which lay in an elephant corridor area. The field has been raided by elephants every year. An electric fence was present at the boundary of the field around 2 km in length.

The beehives were placed at the corners of a 10 m rectangle within the field, 2 m from the electric fence. The beehives were hung under small thatched roofs supported by two poles (Fig. 2). The beehives swung freely at 1.5 m above ground, suspended by wire from the top. The hives were linked to each other with strong, taut, fencing wire.



**Figure 1.** Placement of electric and beehive fence in study area.



**Figure 2.** Experimental setup of beehives.

The experimental setup was placed in the field for three months during the crop growing season from November 2012 to January 2013. The field was monitored every day by a farmer who made observations and daily morning visits for the duration of the study period.

### Results and discussion

In December 2012, elephants visited the field 4 times during the night. However, no damage was caused to the crops. In January 2013, one night around 10.30 pm, a tusker entered the field damaging the outer electric fence (Fig. 3). It walked through the field but stopped at 2.59 m from the beehives (Fig. 4). It stayed still for around 10 min and moved away from the beehives without damaging anything. The elephant may have recognized that the structure consisted of beehives and avoided it.



**Figure 3.** Damage of electric fence.

Around 500 ml of honey was harvested from the four hives during the trial period. The results of the study suggest that elephants may avoid beehives and do not damage them. Beehives may also enhance rural livelihoods through honey sales. Therefore, it may be possible to use them as a barrier to prevent crop raiding, assessment of which however, requires a larger scale study.

### Acknowledgements

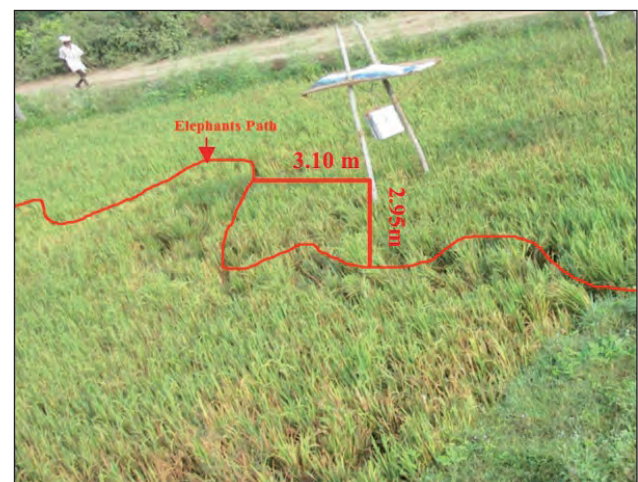
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**Figure 4.** Undamaged beehive.