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The Tal-Kholgarh Elephant Corridor in Odisha, India

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Introduction

The Asian elephant (*Elephas maximus*) is a high profile and charismatic species with important ecological as well as cultural associations in India. But it is also one of the most conflict-prone wildlife species in India, causing large-scale damage to crops, houses and human lives. Due to loss of habitat, elephants may extend their range and raid crops to meet their energy requirements. During such forays, elephants may intrude into agricultural lands and human settlements. Confrontation is inevitable under such circumstances, resulting in elephant and human deaths and property damage. Each year about 400 people and 100 elephants lose their lives and nearly 500,000 families suffer crop damage in India (Sugumar & Jayaparvathy 2013).

Human-elephant conflict (HEC) refers to negative interactions between elephants and people. Conflicts occur when human populations encroach upon elephant range, reducing access to resources required by elephants. HEC is becoming more frequent due to increase of human populations and has become one of the most challenging problems in wildlife management (Mohanty & Mishra 2017). Many solutions to HEC have been tried such as electric fences, trenches, bees, thorn plants, and chilli pepper. However, such deterrents are not always effective and often require intensive maintenance to ensure their efficacy.

Role of wildlife corridors in conservation

Fragmented wildlife populations are more vulnerable to extinction owing to environmental, demographic and genetic variability (Sukumar 1989). Landscape connectivity enhances the populations of many species (Gilpin & Soule 1986). Corridors facilitate connectivity across habitats and increase diversity by improving the survival of species (Varma *et al*. 2008). Corridors may be created for a specific species (Harrison 1992) or to create habitat connectivity in general. Re-connecting habitat-fragments with corridors can decrease population fluctuations and corridors can establish and stabilize populations, improving ecological function and biological diversity. But corridors can also have negative effects due to increase of mortality and disease spread (Henein & Merriam 1990).

The main goal of elephant corridors is to prevent the decline of elephant populations. Elephants have large home ranges of up to a few hundred km^2 and are mega herbivores. Providing more space and natural resources for elephants may minimize their venturing into human settlements and crop fields and can reduce HEC. Therefore, corridors may also help manage HEC (Wollman 2012; Roy & Sukumar 2015). Planting preferred fodder species in and close to the entrance of corridors, may increase the chance of elephants using them. Artificial water holes can be created to ensure that elephants remain within an area and corridors that provide access to perennial water sources, may be used more by elephants.

The Wildlife Trust of India, other NGOs and the Government Project Elephant have identified 101 elephant corridors across the country. Of these, 28 are located in south India, 25 in central India, 23 in north-eastern India, 14 in northern West Bengal and 11 in north-western India (WTI 2021).

Tal-Kholgarh elephant corridor

In Odisha, elephants used to be able to move easily along traditional routes. However, at

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present, many of them are blocked due to development and elephants are forced to use new movement pathways. The Tal-Kholgarh corridor was identified by the Government of India in 2010. It is in two sections with a total length of 6.3 km and 0.5 to 0.8 km in width (Fig. 1). It links four fragmented forest patches; Raun Reserve Forest, San Rengali Protected Forest, Tal Reserve Forest and Kholgarh Reserve Forest. It is located within the Rairakhol Forest Division, which is one of six divisions of the Sambalpur Circle, Odisha.

The habitat within the corridor consists of 33.13% shrub, 18.75% grass, 8.75% herbs and 39.37% barren land. The corridor has two mineral licks and three water holes. Elephants are seen throughout the year in the Rairakhol Division. Two watchtowers and one protection camp are present for elephant monitoring. The elephant population in Rairakhol Division decreased from 165 in 2002 to 16 in 2017 (Fig. 2). Of 7 elephants that died from 2010–2017, one was killed by poachers, five were natural deaths and one was due to unknown cause. Damages

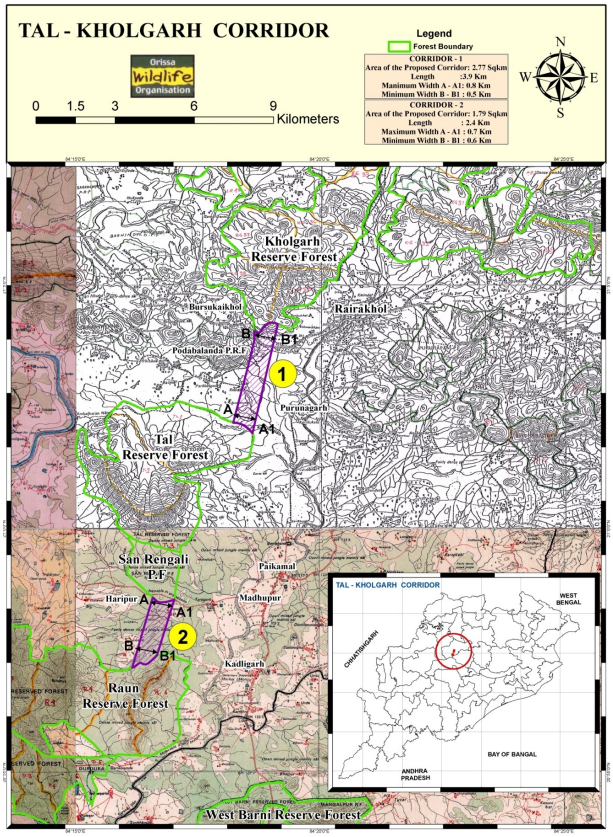

Figure 1. Locations of the two sections of the Tal-Kholgarh elephant corridor (numbered 1 & 2) in the Rairakhol Forest Division. Inset: Map of Odisha.

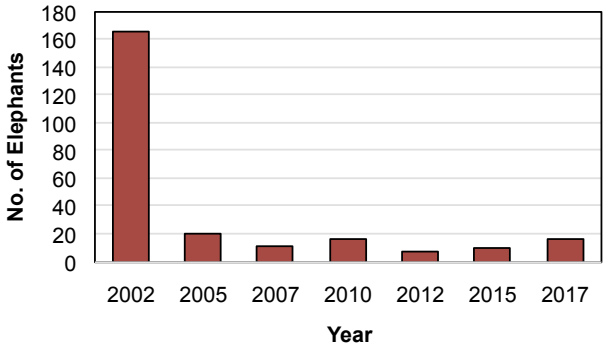

Figure 2. Elephant population in Rairakhol Forest Division from 2002 to 2017 (Source: Census Report of Forest and Environment Department, Govt. of Odisha).

including crop raiding, caused by elephants in the Rairakhol Forest Division have been increasing (Table 1, Fig. 3).

Although the Tal-Kholgarh elephant corridor was declared in 2010, elephant deaths and HEC incidents have continued. Currently around 22 elephants are thought to use the corridor. The corridor contains some good habitat, salt licks and water sources. However, a railway line crosses the corridor and other developmental activities also occur within it. There is also a significant amount of barren land within the corridor. The increasing HEC incidents and crop damages reported during the study period may reflect increasing trends of corridor fragmentation and disturbance. Studying the movement patterns of the elephants in relation to the corridor and providing more resources for elephants within the corridor would be desirable in its management.

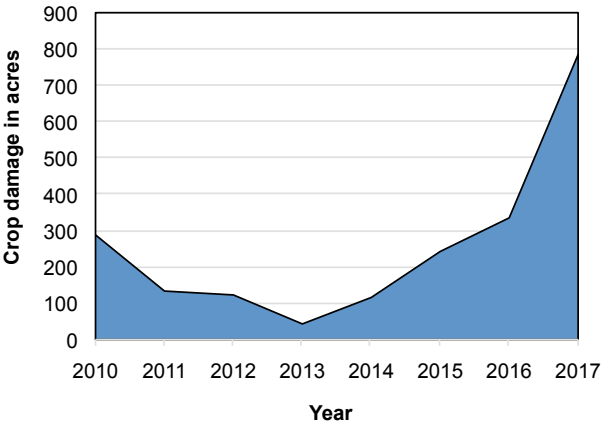

Figure 3. Crop damages due to elephants in Rairakhol Forest Division from 2010 to 2017.

Table 1. HEC incidents in Rairakhol Forest Division from 2010–2017.

	2010	2011	2012	2013	2014	2015	2016	2017
House damage	49	4	1	1	3	3	1	28
Human injury	0	0	0	0	4	1	0	0
Human death	1	1	0	1	3	3	1	2
Elephant death	1	0	2	2	0	0	1	1

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