



Study on human and wildlife interactions at surroundings of protected areas

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Abstract

This study was conducted at villages which are found abutting Brahmagiri Wildlife Sanctuary and a rehabilitated area found at the fringe of Rajiv Gandhi National park (Nagarhole) This study clearly understand the important benefits of the local people from the wildlife and negative interactions between human and wildlife which would be taken into consideration to avoid the future conflicts with wild animals. There is both positive and negative benefit from this relocation where few people are happy and few more are unsatisfied with the relocation. Even after settling out of the forest still, people have a negative interaction with the wild animals in the form of human-elephant conflict. Crop-raiding, damage to human properties, attack on human etc are the daily problems faced at Nagapura II, Kurchi and Manchalli. Due to breakage points in the forest fencing, there is a frequent movement of elephants around the tribal settlements. Moreover, the welfare status of these tribal people is miserable. Right from the drinking water to newborn deaths, there are severe problems for their living. The government needs to take care of all these issues to provide a better living for these haadies.

Keywords: wildlife, interactions, relocation, management, human-wildlife conflicts

1. Introduction

Human-wildlife interactions results in negative impact on people, resources, wild animals and habitat. Man-animal conflict has been in existence for as long as humans have existed and wild animals and people have shared same landscapes and resources (Lamarque, 2008) [10]. Human-wildlife conflict refers to any kind of interaction between humans and wildlife that results in positive or negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment (Hoare 2001) [7]. Human-wildlife conflict is an active critical threat to the survival of many endangered species, like wild elephants, buffalo, tiger, lion, leopard etc. such conflicts affect not only its population but also has broadened environmental impacts on ecosystem equilibrium and biodiversity conservation. It is a challenge to ensure the peaceful coexistence of wild animals among high densities of humans. Research indicates that even in such high human density areas, attacks on humans, domestic animals or on property in most cases can be kept to very low levels (Habib *et al.*, 2015) [5]. Since protected areas are part of large ecosystems, the activities such as land use changes in the unprotected area have an impact on ecosystem function inside the protected area (Hansen and Defries 2007) [1]. This study is conducted to clearly understand the important benefits of the local people from the wildlife. Here people's perspectives towards wildlife are given importance in order to understand the reasons for the existing human-wildlife conflicts. On whole, this study would give information regarding the negative interactions between human and wildlife which would be taken into consideration to avoid the future conflicts with wild animals. This also would help in bringing awareness to the local people and other

tribal communities about wildlife and its conservation.

2. Materials and Methods

Study area

Study was carried out during May 2016 to April 2017 at Napapura II, Kurchi and Manchalli villages of Karnataka state. Nagapura II found towards the east of Rajiv Gandhi National Park (Nagarhole) belonging to Hunsur taluk of Mysore district. This settlement which is of nearly 45 families has been residing at the forest fringe of Rajiv Gandhi National Park since 2001. Kurchi and Manchalli located in border area of Brahmagiri Wildlife Sanctuary in the Kodagu district, Karnataka State abutting to the forest boundary (Fig. 1).

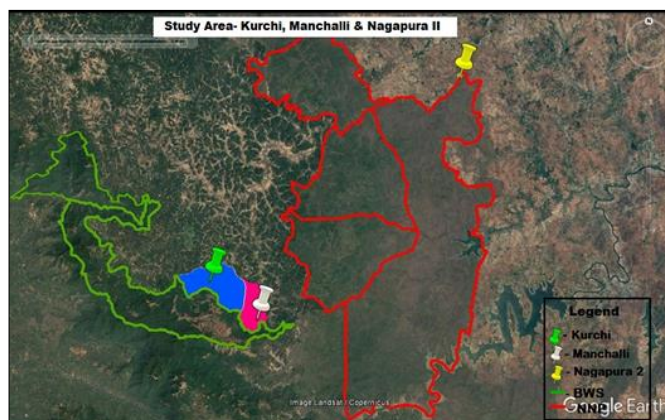


Fig 1: Study areas- Kurchi, Manchalli & Nagapura II Villages

Methodology

Direct household interview technique is adopted. The different

module of questionnaires was prepared for both relocated tribal villages and for the conflicted villages. The findings from this study are statistically represented which would give a clear cut idea about the negative interactions between human and wildlife. Secondary data from journals and newspapers regarding tribal relocation and conflict is also collected. Recently relocated villages from the forest areas are also interviewed which would give the information about the current status of their dependency on wildlife for their living. It also helps in understanding the positive benefits of relocation on the tribal community. Along with this interviewing technique, a general village survey is also conducted to know the cue and clues which are partly resulting in human-wildlife conflicts. Later those can be taken into consideration for creating awareness among the community people.

3. Results and Discussion

Results

Kurchi village found abutting to Brahmagiri Wildlife Sanctuary towards the north of Kodagu District consisting of nearly 150 houses. This village is situated right next to the wildlife sanctuary which has Elephant Proof Trench (EPT) and solar fencing. Due to improper maintenance of the boundary barricades, there are few loopholes found which serve as the entry points for wild animals into the village. Frequently encountered wild animals in this village are elephants, gaur, wild boar, chital, porcupine etc. Every week people encounter wild animals in this village (Fig. 2) and the major problem is due to wild elephants. The indirect evidence of elephant pad and dung found in different places proves that there is elephant movement in this village.

For study purpose, only stakeholders were interviewed and 26 household interviews were conducted. Around 64% of the people living in this village owns more than 6acres of land (Fig.3) with barbed wire fencing boundary. The main occupation of these people is agriculture. Coffee and other plantation crops like areca nut, pepper etc are the main agricultural crops grown in this village. For irrigation purpose, there are 1-2 man-made water tanks created inside the coffee estates and these are serving as a water resource for wild animals. The essential food and water resources required for wild animals especially for elephants it is easily available inside the coffee estates. Similar resources are shared between human and wild animals for their living which results in conflict. As per observations made during the study period, out of 26 interviewed households only 3 stakeholders have taken the self-mitigating measures like Elephant Proof Trench (EPT), Solar fencing, Chilli-tobacco powder method etc (Fig.4). Due to distributed lands in different places, rest stakeholders haven't taken any measures to prevent the entry of wild animals into their property. And 65% of the people living here believe in Co-existence with wild animals (Fig.5).

Thus from all the collected and observed information, it proves that a single coffee estate serves all the basic requirements like food, water, and shelter for wild elephants which get habituated easily for easily available resources. In such places, it's expected to have Human-wildlife interactions, as same resources are shared between human and wild animals for their living. This interaction results in

conflicts in the form of crop raiding, damage to irrigation and sprinkler pipes, attacks on domestic animals, human death, destruction to human property etc. Hence such village is considered to be a conflict-prone zone where people are living with the conflict.

Manchalli village found abutting to Brahmagiri Wildlife Sanctuary towards the north of Kodagu District consisting of nearly 100 houses. This village is situated right next to Kurchi village where both of the villages share the same Brahmagiri wildlife sanctuary boundary which has Elephant Proof Trench (EPT) and solar fencing. Frequently encountered wild animals in this village are elephants, gaur, wild boar, chital, porcupine etc. Every week, people encounter wild animals here (Fig.6). Major conflict observed in this village is due to wild elephants. The indirect evidence of elephant pad and dung found in different places proves that there is elephant movement in this village. Apart from elephant there is minor loss due to porcupines and gaurs.

The scenario of Manchalli village is similar to that of Kurchi village where 16 households were interviewed out of which 69% of the people owns more than 6acres of land (Fig.7) with normal barbed wire fencing boundary. Coffee, areca nut, pepper etc are the staple agricultural crops grown here. Every estate has their own man-made water tanks inside their property for irrigation purpose to their coffee and other plantations. As all the natural resources needed for a wild animal is available in these places and due to nearness to the forest boundary, it is obvious for a wild animal to get habituated for the these easily available resources. In such places it is expected to have human-wildlife conflicts resulting in crop-raiding, damage to human properties, human attacks etc. Out of 16 interviewees, only 1 stakeholder has taken the self-mitigating measure of Solar fencing to his property to prevent the entry of wild animals (Fig.8). And 56% of the people living in this village believe in co-existence (Fig.9).

In both Kurchi and Manchalli village, the major problem is due to elephants. And elephants are known to get habituated for easily available food and water resources. 95% of people are exposed to the conflict in both the villages (Fig.10). As per observations, in both of these villages coffee, areca nut and pepper are the major crops grown and each coffee estate has 1-2 man-made water tanks inside their property. Altogether these coffee estates serve all the needed things for an animal to be dependent on. Thus it is expected to have negative interactions in the form of conflict in such places where all the natural resources are easily available for wild animals.

As per observations, it is found that the proper scientific maintenance of Forest boundaries like EPT and solar fence in all the seasons would bring down this conflict problem to an extent. And the other best method which is needed to be adopted along the forest boundaries is Railway fencing which is found to be the most appropriate method to prevent wild elephants entering into the villages. Laying all these barricades and proper maintenance of these would definitely bring remarkable changes in these conflict zones.

Karnataka forest department in collaboration with noted NGOs; in 2001 280 families were relocated from Madenur forest, Rajiv Gandhi National Park (Kodagu district) to Nagapura in Hunsur taluk of Mysore district. A total of 170

families has been resettled in four blocks as Nagapura I (50 families), Nagapura II (45 families), Nagapura III and Nagapura IV within the released area of Veerannahosahalli RF. Basic facilities and funding were given by the government to each family in the form of house, land, education, money, water facility etc. To know the benefit to local people from wildlife and its management, Nagapura II was selected.

Benefit from wildlife to local people doesn't only mean the illegal use of forest products or any kind of wildlife products. But from the wildlife management point of view, tribal people relocation from different forest areas to other places out of protected areas also plays a vital role in benefiting the tribal people. In this aspect, Nagapura II was selected to understand the real benefit of wildlife management to the haadies.

Nagapura II tribal settlement consists of two tribes Jenu Kurubas and Yeravas. At present around 30 families are living in Nagapura II. A questionnaire survey was conducted to understand the current welfare of Tribal people after relocation. It was found that even today around 61% of the people are not satisfied with the relocation (Fig.11), as the

assurance given by the government for relocation was not fulfilled completely. This has worsened the present living status of the people at Nagapura II. Because of certain political disputes, there is no electricity supply at present. Due to improper drinking water supply, there are cases of newborn deaths, mental retardation and people suffering from other common diseases. Lack of water for irrigation purpose has resulted in creating barren lands, which was given by the government for agriculture purpose. People go to Kodagu and other nearby places for labor work to run their family.

Apart from these issues, there is Human-Elephant conflict also at Nagapura II. Due to breakages in the boundary barricades, there are often elephant movements in and around the resettlement area. 72% of the people living there have been exposed to the conflict in one or the other way (Fig.12). Crop raiding, fatal attacks on people are quite frequently occurring here. These are few major problems faced by the Haadies which has worsened their welfare status. Government and respective NGOs need to look over these problems, to support the haadies morally and economically for better living.

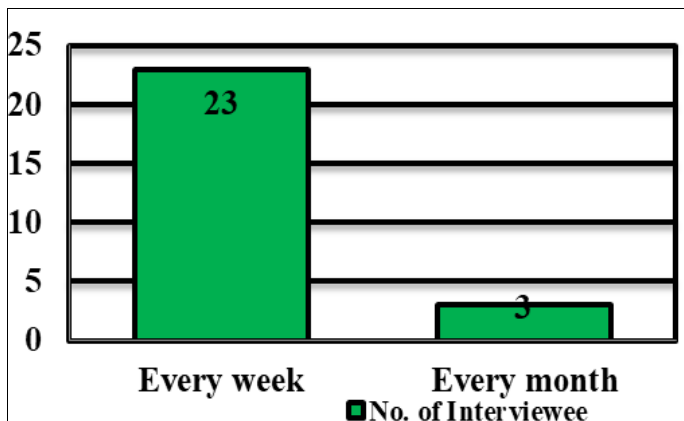


Fig 2: Wild animals encounter in Kurchi Village

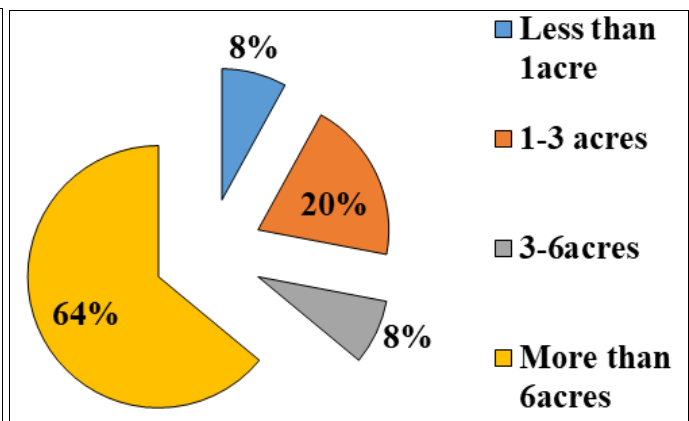


Fig 3: Status of Ownership of Land in Kurchi Village

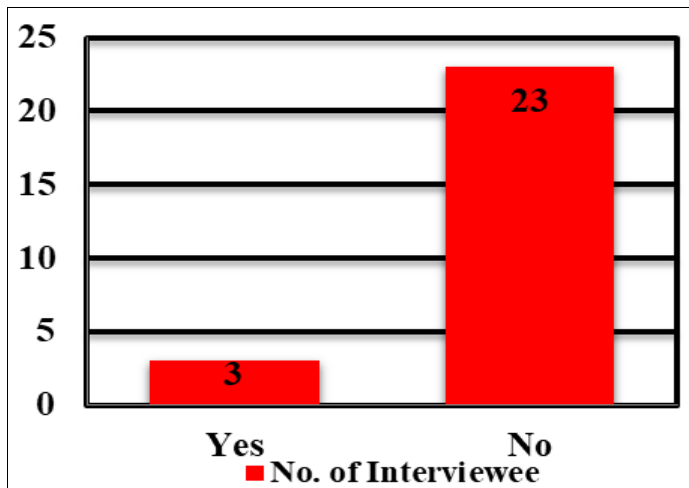


Fig 4: Self-mitigating measures taken by the interviewees in Kurchi Village

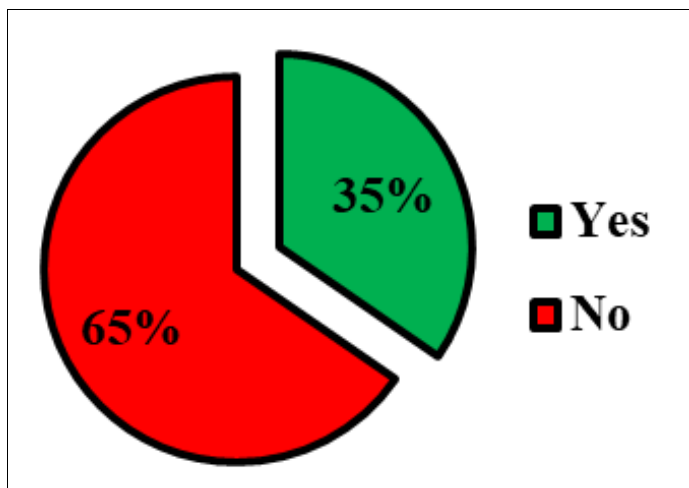


Fig 5: Co-existence with Conflict in Kurchi Village

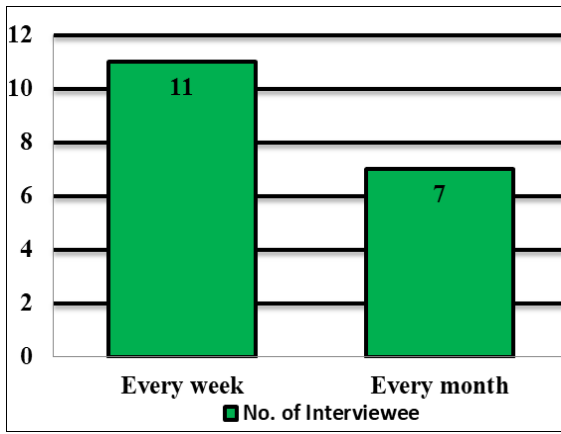


Fig 6: Wild animals encounter in Manchalli Village

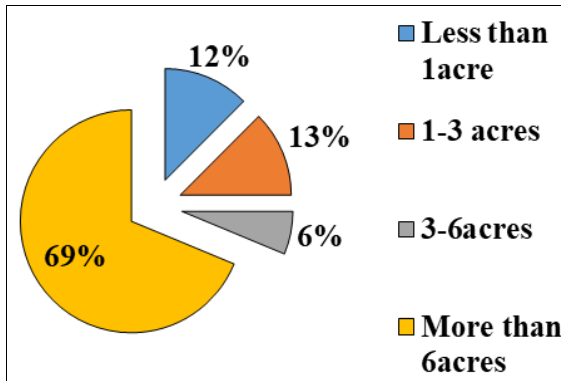


Fig 7: Status of Ownership of Land in Manchalli Village

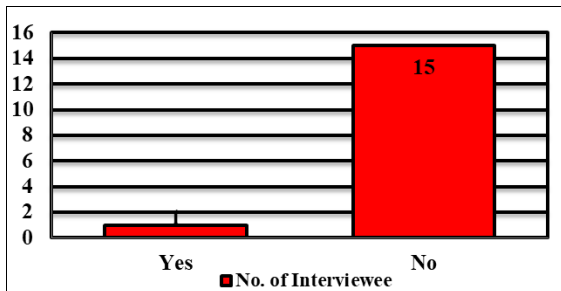


Fig 8: Self-mitigating measures taken by the interviewees in Manchalli Village

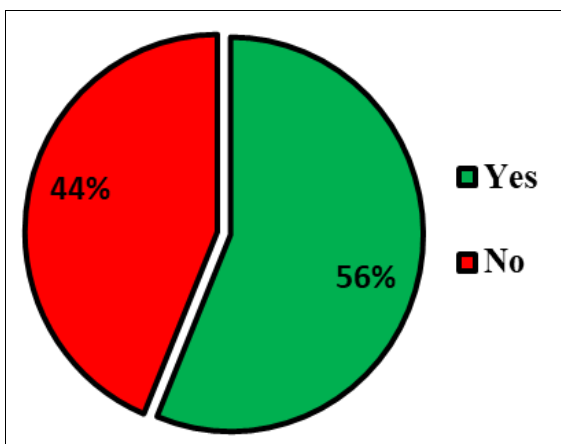


Fig 9: Co-existence with Conflict in Manchalli Village

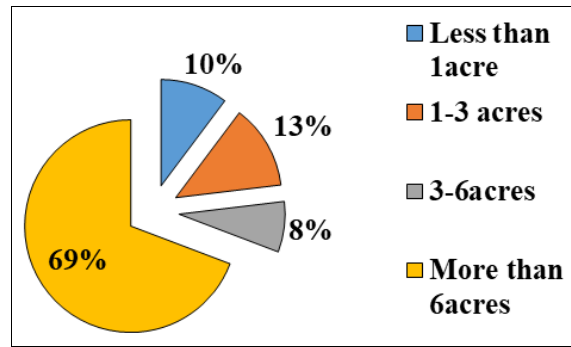


Fig 10: Status of Ownership of land in Kurchi and Manchalli Village

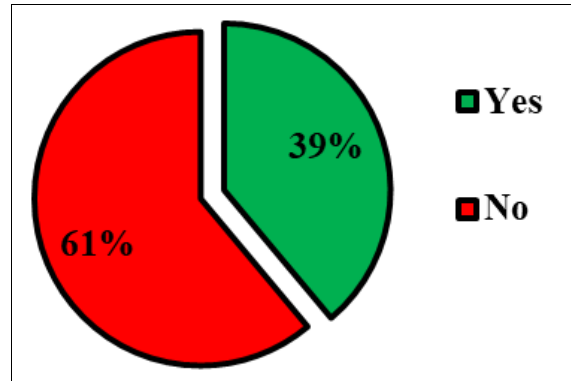


Fig 11: Relocation Satisfaction of Nagapura II Rehabilitees'

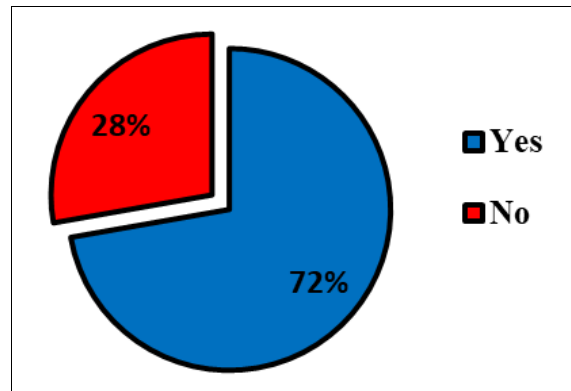


Fig 12: Exposure to Conflict by Nagapura II Rehabilitees'

Discussion

There are common resources shared between human and wildlife. Coffee and areca nut plantations, pepper, jackfruit trees etc. serve as good attractants for elephants and the man-made water tank provides water for elephants and other wild animals. Thus a single coffee estate provides all the basic needed things for wild animals to live in that place which promotes the easy habituation for easily available natural resources. Even though these common resources shared is found in human property, still, competition exists between two for food, water, and land resources. This results in negative interaction finally leading to Human-wildlife conflict. Maintenance of effective barriers like railway, solar fencing, and Elephant proof trench (EPT) at the forest boundaries is the solution to prevent the entry of wild animals into the private property. Elephant ride also controlled by chilli-tobacco rope

fence against the crop-raiding elephants in south India and it was proved that chilli-tobacco rope is an effective control measure in low-rainfall seasons (Chelliah *et al.*, 2010)^[2]. The chilly plant is less palatable to elephants. Economic profit of this cultivation in the marginal areas was assessed in Zimbabwe (Parker and Osborn 2006)^[12]. Maintenance of effective non-electrified fences was also suggested in Kenya (Kioko *et al.*, (2008)^[8]. The chilli-dung brick was used for deterring elephants from the cultivated areas in Africa (Osei-Owusu and Bakker 2008)^[11]. The noxious smell emanated by burning of the dried chilli-dung brick irritated elephants and prevented its entry into a crop field when it was burned near the farm. It was also proved successful in Indonesia (Hedges and Gunaryadi, 2010)^[6]. Spotlights and chilli-fence are good control measure for deterring elephants and its efficacy was conceded only when these methods were functioned with noise (Davies *et al.*, 2011)^[3]. Beehive fence was proved as a good control measure to mitigate human-elephant conflict (King *et al.*, 2009)^[9]. Apart from all these things, local people participation in the control of conflicts is very important (Fernando *et al.*, 2005)^[4]. Creating awareness among the local residents regarding wild animal's movements near forest boundary is very much necessary for co-existence in such conflict zones.

4. Conclusion

In the present study, the interaction between human and wildlife at surroundings of two different protected areas is clearly explained. In the wildlife management point of view, tribal people relocation out of protected areas to different settlement areas also plays a vital role in benefiting the tribal people. This relocation concept as brought tremendous changes in the tribal people living (Jenu Kuruba and Yerava tribe) at Nagapura II found adjoining to Rajiv Gandhi National park. There is both positive and negative benefit from this relocation where few people are happy and few more are unsatisfied with the relocation. Even after settling out of the forest still, people have a negative interaction with the wild animals in the form of human-elephant conflict. Crop-raiding, damage to human properties, attack on human etc are the daily problems faced at studied villages. Due to breakage points in the forest fencing, there is a frequent movement of elephants around the tribal settlements. Moreover, the welfare status of these tribal people is miserable. Right from the drinking water to newborn deaths, there are severe problems for their living. The government needs to take care of all these issues to provide a better living for these haadies. It is found that in Kurchi and Manchalli village which is found abutting to Brahmagiri wildlife sanctuary, there are common resources shared between human and wildlife. Coffee and areca nut plantations, pepper, jackfruit trees etc serve as good attractants for elephants and the man-made water tank provides water for elephants and other wild animals. Thus a single coffee estate provides all the basic needed things for wild animals to live in that place which promotes the easy habituation for easily available natural resources. Even though these common resources shared is found in human property, still, competition exists between two for food, water, and land resources. This results in negative interaction finally leading to Human-wildlife conflict. Maintenance of effective barriers like

railway, solar fencing, and Elephant proof trench (EPT) at the forest boundaries is the solution to prevent the entry of wild animals into the private property. Apart from all these things, local people participation in the control of conflicts is very important. Creating awareness among the local residents regarding wild animal's movements near forest boundary is very much necessary for co-existence in such conflict zones.

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