

COEXISTENCE WITH GIANTS: EXPLORING COMMUNITY PERSPECTIVES ON ELEPHANT CONSERVATION AND CONFLICT RESOLUTION

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Received: 17th May 2025, **Accepted:** 8th January 2026

ABSTRACT

The Anaikatti corridor in Tamil Nadu is a critical migration route for elephants, but frequent human-elephant conflicts arise due to increasing anthropogenic activities. This study aimed to assess local perceptions of elephant conservation and conflict through a questionnaire survey conducted in the Anaikatti North-Anaikatti South corridor, Coimbatore, between January and May 2023. A total of 196 respondents participated in the survey. The results indicated a significant rise in elephant visits over the past decade. Among respondents, 38 % believed that natural coexistence was the most effective conflict mitigation strategy, while 33.5 % expressed a religious connection with elephants. Fear of elephants was reported by 22 % of participants, and only 5 % remained neutral. The findings highlight the importance of integrating community perspectives into conservation strategies. Strengthening coexistence through awareness programs, conflict mitigation measures, and policy interventions is essential for ensuring both community safety and wildlife conservation.

Keywords: Anaikatti, elephant corridor, community perspective, conflict management

INTRODUCTION

Humans and animals should be able to coexist in healthy environments. However, human population growth and urbanisation result in habitat fragmentation and habitat loss. The interactions between humans and wildlife are primarily negative. These negative interactions result in conflicts between populations, sometimes extending to the ecosystem level. The primary causes of the increased incidence of human-elephant conflict (HEC) among nations within the elephant's range are habitat degradation and forest fragmentation (Talukdar *et al.*, 2019; Fernando *et al.*, 2011). The increase in anthropogenic activities

adversely impacts the conservation of elephants throughout India. Human fatalities are a significant result of conflict between people and elephants in India and Southeast Asia, where hundreds of people lose their lives every year due to interactions with elephants (Lahiri, 1980; Zhang & Wang, 2003). During the late 1990s, Asian elephants were captured or culled as control measures for human–elephant conflicts (Doyle *et al.*, 2010; Fernando *et al.*, 2011). However, this was not an effective way to control HEC, as other elephants may replace those removed species (Sukumar, 2003). Removing a keystone species, such as elephants, is also not beneficial for the ecosystem. HEC has become common in the Western Ghats, resulting in crop damage, property loss, disruption of livelihoods, and human fatalities, all of which have negative impacts on people's perceptions and attitudes towards wildlife (MOEF, 2010).

Perceptions and attitudes of local people significantly influence wildlife conservation (Ramkumar *et al.*, 2014) and are greatly influenced by crop loss and reliance on wildlife (Parry & Campbell, 1992). To mitigate negative perceptions of wildlife, compensation for livestock losses or crop damage caused by wildlife is often offered (Mishra *et al.*, 2003; Agarwala *et al.*, 2010). Engaging local people in conservation develops shared goals and promotes the development of trust among various stakeholders, such as governmental organisations, conservationists, and local communities (Treves *et al.*, 2006). Obtaining the support and participation of communities in collaborative conservation efforts is a persistent challenge in developing and implementing conservation policies (Mulder & Coppolillo, 2005). Community engagement is very important to mitigate human wildlife conflicts, particularly in the case of species with a high probability of interacting with humans and extensive home ranges, such as elephants. Elephant corridors have been identified as a critical conservation measure. They allow elephants to move and disperse across fragmented habitats, increasing their effective population size and lowering the risk of extinction. Elephant corridors may also help the movement of other animals (Puyravaud *et al.*, 2017). Through facilitating movement between habitat islands, corridors may provide animals access to otherwise inaccessible areas (Johnsingh & Williams, 1999). The protection and upkeep of corridors are crucial for the conservation of elephants and other species, for which local community involvement and awareness are critical (Desai & Baskaran, 1996). Notably, the Anaikatti region experienced higher casualties than neighbouring areas within the same forest range (TNFD), which was the main reason for choosing the Anakatti corridor for this study. Understanding local people's opinions regarding elephant corridors is essential to develop a mitigation plan that effectively reduces conflict. The current study assesses local people's attitudes, expectations, and perceptions of HEC in the Anaikatti elephant corridor in the Coimbatore Forest Division, Tamil Nadu, Southern India.

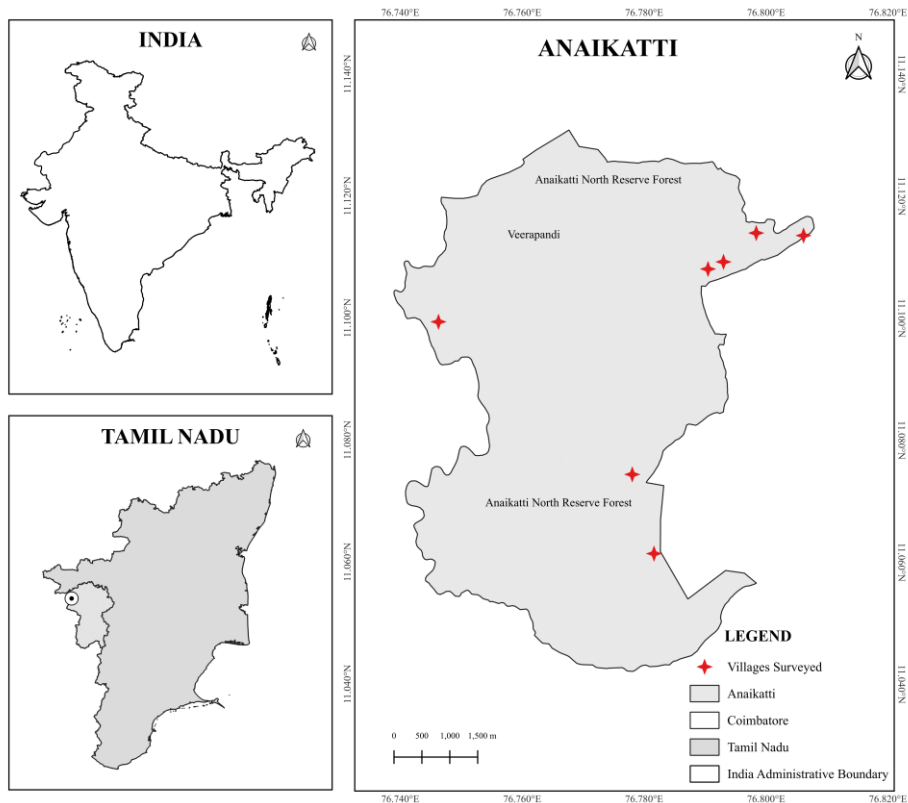
MATERIALS AND METHODS

Study area

The Anaikatti corridor (Fig 1.) located at 11° 5 8"–11° 7' 58" N, 76° 46' 30"–76° 48' 59" E connects the Anaikatti North Reserve Forest and the Anaikatti South Reserve Forest of Coimbatore Forest Division. The land cover in the corridor consists of tropical thorn forests and deciduous forests. There are approximately ten villages with numerous human habitations and agricultural lands in the corridor. Elephants from the Sathyamangalam Tiger Reserve move to the Mannarkad Forest Division of Kerala through the foothills of Anakatti which is a highly undulated mountains in the upper plateau of the Coimbatore

division (Menon, 2017). The corridor faces various threats, including deforestation, habitat fragmentation, overgrazing by livestock, and poaching. It is also threatened by the construction of roads and other infrastructure and the expansion of human settlements. Anaikatti corridor is one of the oldest elephant corridors in Tamil Nadu, and it connects the Periyanaickan Palayam and Bolampatti Forest Ranges. A group of forest-dwelling tribal populations reside in Anaikatti, whose primary livelihood is farming, which has become the primary reason for conflict.

Fig. 1: Study area map



Data collection

People's perceptions of elephant conservation and human-elephant conflict in the Anaikatti corridor were gathered using a questionnaire survey (Annexure) described by Ramkumar (2014). This corridor comprises approximately ten villages with numerous human settlements and agricultural lands. Seven villages in the corridor (Kondanur, Pudur, Panapalli, Kandivalli, Sembukarai, Dhoomanur, and Thuvaipathy) were chosen based on records of high conflicts by the Tamil Nadu Forest Department. Using a simple random sampling design, 196 respondents were selected across the study villages. The village head assisted in identifying zones with frequent human-wildlife conflict, and random selection of adult respondents (≥ 18 years) was carried out within these zones. This approach was essential for obtaining reliable data on HEC in the study area. The respondents were

provided with a comprehensive explanation of the study's objectives, and their consent was obtained before being involved in the survey. The survey was conducted in the local language (Tamil). Information was gathered through "Precise and closed" and "Broad and Open-ended" questions, allowing respondents to express their views freely. The questionnaire consisted of data on the respondents, such as their age, literacy status, occupation, and gender, which improved the results.

Data analysis

Statistical analysis was done using R software. The relationship between categorical variables was examined using Chi-square statistics. Pearson's correlation was used to analyse the relationship between the people who experienced the conflict, their attitude towards the conservation of the forest and elephants, and the relationship between the respondent's occupation and conservation. Multiple correspondence analysis was used to study the association between different variables.

RESULTS

The gender composition of the 196 respondents was 32 % female and 68 % male. Among the respondents, 83 % identified as farmers, while 17 % operated small-scale businesses. Forty percent of respondents reported elephant sightings primarily occurring at night (Fig. 2), while 46 % (Fig. 3) documented daily incursions into residential or agricultural zones. Of the respondents, 35 % reported crop damage (Fig. 5), 31 % property damage and 28 % casualties.

Fig. 2: Time analysis of elephant movement

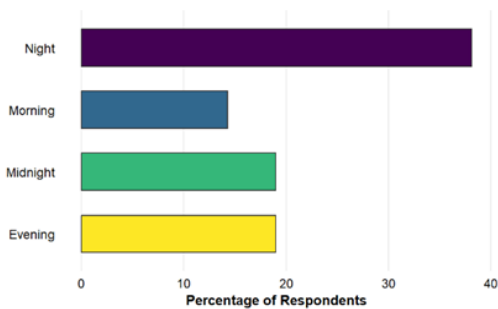


Fig. 3: Elephant Movement Frequency

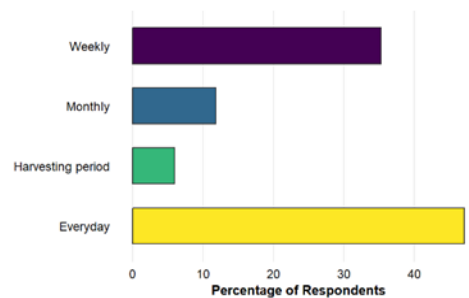


Fig. 4: Seasonal-wise, elephant movement

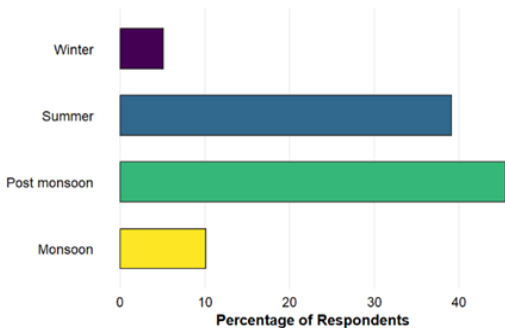


Fig. 5: Damages caused by elephants

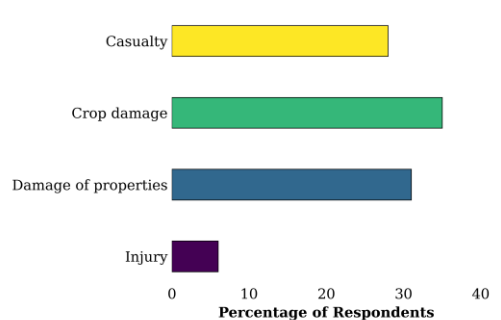


Fig. 6: People’s perception on HEC

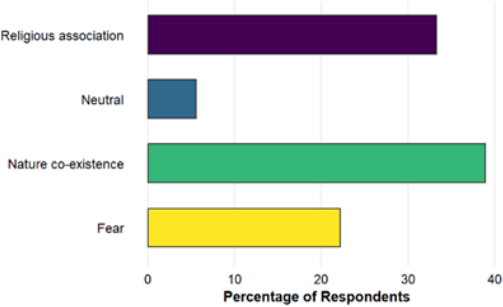


Fig. 7: Elephant conflict mitigation strategies

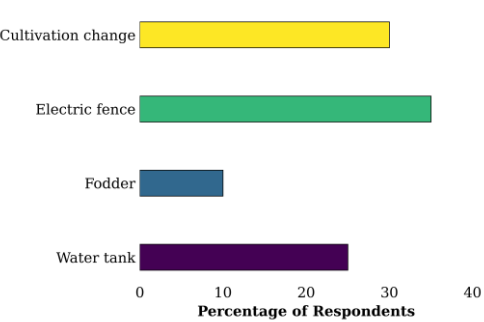


Fig. 8: Reasons for the HEC in the study area

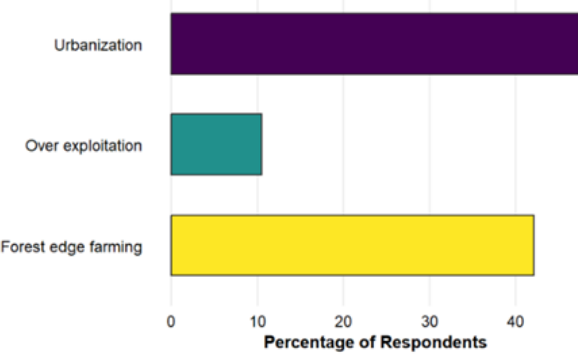


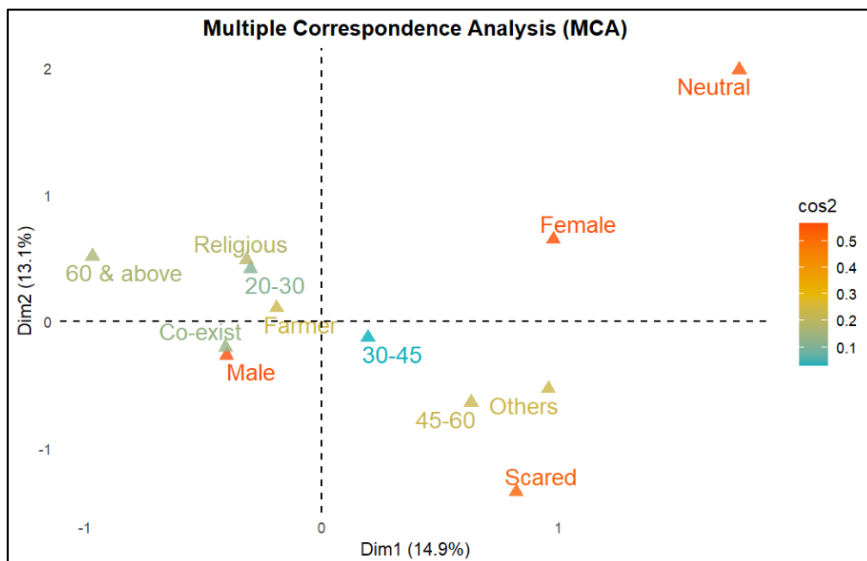
Fig. 9: The oldest tribal couple of the Anaikatti village



A total of 39 % of respondents identified summer (Fig. 4) as the period elephants were most active, and the season ascribed to the elephants' quest for water sources. While 43 % reported increased elephant movement following the monsoon. Of the respondents, 38 % support coexistence (Fig. 6), 33.3 % have religious beliefs that show their empathy towards conservation, and 37 % endorse physical barriers like electrified fencing and trenches (Fig. 7). Conflict reduction was found to be significantly influenced by the closure of brick kilns, as 75 % of respondents acknowledged a decline in conflict incidents subsequent to their closure.

Regarding crop cultivation, 90 % of farmers in the study villages reported cultivating crops that were frequently targeted by elephants, including banana, coconut, sugarcane, jackfruit, and papaya. In addition, elephant rides on cereals such as ragi (30 %) and maize (43 %) were documented. Forty percent of farmers residing in Kandivalli reported changing their occupation as a result of crop damage by elephants. Fifty-five percent of the respondents from Dhommanur mentioned human interventions as the main reason, which highly coordinates with the respondents from other villages, with 47.4 % (Fig. 8) believing that urbanisation is the important reason. Furthermore, an elderly couple in the Thuvaipathy village (Fig. 9) noted the substantial escalation in conflicts due to heightened human activities and the conversion of forests into agricultural and residential areas. Eighty three percent of respondents stated that the Tamil Nadu Forest Department provides timely compensation, while 17 % reported delays in receiving it or not receiving it at all.

Fig. 10: Multiple Correspondence Analysis revealing the association among different variables: respondent's age (20-30, 30-45, 45-60, 60 & above), gender (male, female), occupation (farmer, others) and people's perception (religious, co-exist, scared, neutral).



The human-elephant conflict study in 7 villages showed statistically significant differences in elephant sightings, frequency of entry, damage caused, seasonal movement, conservation attitudes, mitigation measures, conflict reasons, and incidence rates before and after brick kiln closures (all $p < 0.001$). There was a positive correlation ($r = 0.763$)

between perspectives on elephant conservation and encounters with conflict. The Multiple Correspondence Analysis (Fig. 10) shows that the farmers had a positive attitude towards the conservation of elephants.

DISCUSSION

The people of the Anaikatti corridor had a positive attitude towards elephant conservation, with around one-third of the respondents believing that humans should coexist with elephants. The results revealed that a significant portion of the local population relied on farming as their livelihood and has an economically diverse community. The dependence on agriculture makes them vulnerable to conflicts with elephants, which often result in crop damage and economic losses. Therefore, there is a need for targeted interventions that address the aspects of HEC mitigation, such as crop protection and alternative livelihood options. Diverse viewpoints were expressed regarding strategies for resolving conflicts. Bell (1984) and Sukumar (1989) proposed that adopting a community-based approach involving farmers near elephant refugees could be effective in reducing the HEC. Most respondents in our study reported observing elephant movements at night, similar to the study by Rohini *et al.* (2018). This made people less active outdoors at night. Elephant movements occurred at varying frequencies, with a significant proportion of respondents reporting daily encounters that highlight the concrete consequences of human-elephant conflict on livelihoods and safety. Therefore, developing and implementing effective early warning systems and compensation mechanisms would be relevant. The study documented seasonal fluctuations in elephant movement. Respondents linked elephant movements to water availability, with many believing that elephants enter residential areas during the summer in search of water. This insight highlights the importance of strategically managing water sources to reduce elephant's attraction to human settlements during dry periods. The most favoured control measure mentioned by respondents was electric fencing. This suggests that combining physical barriers such as electric fencing and habitat conservation may effectively reduce conflicts.

Cultural variations in attitudes towards particular species determine whether farmers consider a damaging species troublesome or acceptable (Fernando *et al.*, 2005). Similar to the findings of Newmark *et al.* (1993) and De Boer & Banguetem (1998), we found people residing in the Forest Reserve held a positive attitude towards forest conservation despite having conflict-related issues. Most participants in the study area showed favourable attitudes towards elephant conservation, regardless of the obstacles they encountered in their daily activities, thereby emphasizing the community's inherent worth in supporting conservation initiatives. Aspects of occupation and demographics influenced perspectives on conservation and conflict. Age and occupation were found to be significant determinants of these attitudes via multiple correspondence analysis, indicating that generational experiences and societal responsibilities influence nuanced perspectives. Elephant conservation efforts have been recognised and appreciated by communities in various regions, such as the Shew-U-Daung Wildlife Sanctuary in Myanmar, Manas National Park in India (Allendorf *et al.*, 2015), and the Terai Arc Landscape in India (Jasmine *et al.*, 2015).

The villagers' sympathy for the elephants arose primarily from their belief that the animals had a right to live in their natural habitats. This ensures that humans and wildlife coexist in India, representing the country's cultural tolerance (Karanth *et al.*, 2010). Despite frequent conflict, elephants are esteemed by rural residents, and this regard is evident in their recognition of the elephant as a vital part of the forest ecosystem. Recently, the

elephant corridors have undergone fragmentation due to numerous human activities and unchecked development occurring in their vicinity (Ramkumar, 2014). Due to these actions, elephants have become isolated in smaller areas and encroached upon new territories. The diminished quality of their habitat has escalated the incidence of HEC (Kumar *et al.*, 2014). The study highlights the significant impacts of HEC on the local community, highlighting that the most common conflict was crop damage. In this study, crop damage was observed as the most common threat to the villages experienced by respondents; it was perceived as the most severe issue of elephant conflict by nearly one-third of the residents. The study indicates that compensation mechanisms for human casualties and property damages are generally effective. However, the main reasons for conflicts identified by respondents are urbanisation, crop cultivation near forest ranges, and overexploitation. These findings emphasise the need for land-use planning and conservation efforts that preserve elephant habitats and minimise human disturbances. Contrary to the prior studies on people's perceptions (Borah *et al.*, 2022, Abdullah *et al.*, 2019), the farmers exhibited an unexpectedly favourable outlook towards elephants. Our research found a significant change in attitudes compared to the other studies (Chinnappan *et al.*, 2023), even though farmers depend on selling their produce for money, which is typically associated with negative views of elephants because of the potential for agricultural damage (Dickman, 2010). This indicates a possible change in attitudes or effective measures taken within the community to address the issue. Though the Coimbatore Forest Division is working actively to safeguard the elephant corridors, understanding the people's perspective will help in developing effective mitigation measures.

CONCLUSION

This study highlights the perspectives of local communities coexisting with elephants in the Anaikatti corridor of the Western Ghats. Despite frequent conflicts, most respondents expressed positive attitudes toward elephant conservation, reflecting deep-rooted cultural respect and ecological awareness. However, recurring crop loss and insufficient compensation remain significant challenges affecting tolerance levels. Strengthening coexistence requires participatory approaches that integrate local knowledge, livelihood security, and effective conflict-mitigation strategies. The insights from this study can support policymakers and conservation managers in designing context-specific interventions that promote harmony between people and elephants across similar landscapes.

ACKNOWLEDGMENTS

We sincerely thank the Tamil Nadu Forest Department for permitting us to conduct this study, Mr. R. Arunkumar, Marudhamalai Range Officer, for his valuable help and support during the fieldwork, and the Guards, Watchers, and forest staff of Marudhamalai Range for their help and cooperation. We thank Mr. Murugesan, Research Scholar, Department of Biotechnology, Bharathiar University, for his valuable time and effort towards this research. We wholeheartedly thank the residents of the villages in the corridor for patiently answering the questions and sharing their experiences.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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ANNEXURE

Questionnaire Survey Sheet

Date:

Occupation:

Location:

Literacy status:

Age:

Gender:

Sl.No.	Question	Response	
1	At which time of the day have you seen elephants?	Morning (06:00 AM-10:00AM)	
		Evening (04:00 PM – 06:00 PM)	
		NIGHT (07:00 PM- 12:00 AM)	
		MIDNIGHT (12:00AM-4AM)	
2	How often do you see elephants here?	Everyday	
		At least once in a week	
		Once or twice a month	
		Only during the harvesting period	
3	What kind of disturbances do you face due to their movement here?	Damage of properties	
		Crop damage	
		Injury	
		Casualty	
4	At which time of the year or season is their movement noticed more?	Summer	
		Monsoon	
		Post monsoon	
		Winter	
5	What are all the most used control measures?	Electric fence	
		Change in crop cultivation	
		Water tank facility by TN Forest Dept	
		Planting fodder trees near and around forest range.	
6	What's your opinion on elephants?	Fear	
		Neutral	
		Religious association	
		Nature co-existence	

7	What are all the possible entry points?		
9	Why do you think they enter the village?		
10	During which period did you face more conflicts or notice more movement of elephants?		
11	What types of crops are being cultivated in this region?		
12	Do you think the number of brick kilns decreased after the order of the court?	Yes	
		No	
13	Does the shutting down of the brick kilns affect the public economically?	Yes	
		No	
14	Do you think the number of incidents decreased after the closure of the brick kilns?	Yes	
		No	
15	Do you think that the affected people get the compensation from the government properly?	Yes	
		No	