Past shadows and gender roles: Human-elephant relations and conservation in Southern India

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Abstract

Some conceptual thinking about human-wildlife relations has lacked translations into empirical studies with an in-depth enquiry into social, cultural, economic and ecological aspects. This study explores human-elephant relations in a cohabited landscape in the Western Ghats of India, with a focus on 'more than conflict' relations. The Valparai plateau, in the Indian Western Ghats, is a landscape dominated by tea estates and remnants of rainforest fragments where human communities cohabit and closely interact with wildlife. We offer an empirical contribution on the variegated and paradoxical relation between care and fear, between empathy and hate and between the residents and elephants of Valparai. Where conflicts occur between elephants and humans, they have multiple meanings. Gender and unpleasant memories serve as drivers of negative attitudes towards wildlife. A conservation intervention based on engagement and collaboration with local people was perceived as highly effective. Preventive and mitigative, rather than reactive conflict mitigation strategies may have a significant role to play in maintaining the social carrying capacity of local communities towards

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elephants. We explore the many facets of human-elephant relations, and the numerous entanglements between them, thereby adding multiple layers to the extant knowledge of human-animal relations in the Western Ghats.

Key Words: Asian Elephants, human-wildlife relations, conflict mitigation measures, Western Ghats, mixed methods, gender, past experience, political ecology, more-than-human, more-than-conflict

Résumé

Les travaux sur les relations entre l'homme et la faune sauvage sont restés conceptuels, avec peu de traductions en études empiriques avec une enquête approfondie sur les aspects sociaux, culturels, économiques et écologiques. Cette étude explore les relations entre l'homme et l'éléphant dans un paysage cohabitant dans les Ghats occidentaux de l'Inde, en mettant l'accent sur les relations « plus que conflictuelles ». Le plateau de Valparai, dans les Ghâts occidentaux indiens, est un paysage dominé par des plantations de thé et des fragments de forêt tropicale où les communautés humaines cohabitent et interagissent étroitement avec la faune. Nous proposons une contribution empirique sur la relation variée et paradoxale entre les soins et la peur, entre l'empathie et la haine et entre les habitants et les éléphants de Valparai. Le genre et les souvenirs désagréables sont les moteurs des attitudes négatives à l'égard de la faune sauvage. Une intervention de conservation basée sur l'engagement et la collaboration avec les populations locales a été perçue comme très efficace. Les stratégies de prévention et d'atténuation des conflits, plutôt que de réaction, peuvent jouer un rôle important dans le maintien de la capacité de charge sociale des communautés locales à l'égard des éléphants. Nous explorons les nombreuses facettes des relations entre l'homme et l'éléphant, et les nombreux enchevêtrements entre eux, ajoutant ainsi de multiples couches aux connaissances existantes sur les relations entre l'homme et l'animal dans les Ghâts occidentaux.

Mots clés: Éléphants d'Asie, relations homme-faune, mesures d'atténuation des conflits, Ghâts occidentaux, méthodes mixtes, genre, expérience passée, la « political ecology », plus qu'humain, plus que conflit

Resumen

La reflexión sobre las relaciones entre los seres humanos y la fauna salvaje ha carecido a veces de traducciones en estudios empíricos con una indagación en profundidad de los aspectos sociales, culturales, económicos y ecológicos. Este estudio explora las relaciones entre humanos y elefantes en un paisaje cohabitado de los Ghats occidentales de la India, centrándose en las relaciones «más que conflictivas». La meseta de Valparai, en los Ghats occidentales de la India, es un paisaje dominado por plantaciones de té y restos de fragmentos de selva tropical donde las comunidades humanas cohabitan e interactúan estrechamente con la fauna salvaje. Ofrecemos una aportación empírica sobre la abigarrada y paradójica relación entre el cuidado y el miedo, entre la empatía y el odio y entre los residentes y los elefantes de Valparai. Cuando se producen conflictos entre elefantes y humanos, éstos tienen múltiples significados. El género y los recuerdos desagradables impulsan las actitudes negativas hacia la vida salvaje. Una intervención de conservación basada en el compromiso y la colaboración con la población local se percibió como muy eficaz. Las estrategias de prevención y mitigación de conflictos, en lugar de las reactivas, pueden desempeñar un papel importante en el mantenimiento de la capacidad de carga social de las comunidades locales hacia los elefantes. Exploramos las múltiples facetas de las relaciones entre humanos y elefantes, y los numerosos enredos entre ellos, añadiendo así múltiples capas al conocimiento existente de las relaciones entre humanos y animales en los Ghats occidentales.

Palabras clave: Elefantes asiáticos, relaciones entre humanos y fauna salvaje, medidas de mitigación de conflictos, Ghats occidentales, métodos mixtos, género, experiencia pasada, ecología política, más que humano, más que conflict

1. Introduction

Human-wildlife relations have received sustained attention from researchers and scholars. Human-wildlife conflict studies presume that conflict is the primary relationship of concern (Treves & Karanth 2003) even though human-environment relationships, in reality, can be complex, ambivalent and often contradictory (Aiyadurai 2016; Goldman *et al*. 2010). A particular focus is on conservation (Barua 2010; Redpath *et al*. 2013), analyzing conflict, tangible losses, economic valuations and mitigation strategies (e.g. Shaffer *et al*. 2019). The common and prevalent assumption is that human-wildlife conflict is worsening, although substantial evidence is lacking (Köpke *et al*. 2021; Treves & Santiago-Ávila 2020). Researchers also tend to view human-environment relationships from a Western worldview, where humans and animals belong to

distinct spaces, rather than dwelt space (Barua 2014). While much of the available literature around human-wildlife relations focuses on negative interactions and conflict issues, there is rising interest in exploring the possibilities of multiple realities in human-wildlife relations, and the diverse range of emotions through which human society relates to wildlife (Agelici 2016; Draheim *et al*. 2015; Pooley *et al*. 2017; Redpath *et al*., 2015).

We delve into some of the recent work in animal geography, linked to political ecology, that explores diverse human/non-human interactions and interrogates the co-production of landscapes by these interactions. Through the conversion of land, fragmentation and loss of forests, and urbanization, animal habitats that are "crucial for animal reproduction, migration and survival" are being transformed at an alarming speed (Lindstrom *et al*. 2014). These fragmented landscapes create 'borderland' communities (Wolch *et al*. 2003), where the "material and metaphorical boundaries" of human areas are highly permeable for animal "trespassing" (Yeo & Neo 2010). These borderlands are spaces of confluence of wildlife and domestic life, where non-human animals constantly trespass between two worlds, and the "porosity of boundaries but also the vulnerability of human life" is amplified (Collard 2012). Points of contact between humans and non-humans are increasingly identified as 'interactions', which can be delightful or which may create anxieties, where the animals become 'pests' and are consequently removed to ameliorate conflicts. While examining such interactions, the emphasis is on the socio-ecological approach, considering the behaviors of both the human and non-human components with a "bird's eye view of a landscape" (Čapek 2010).

The present debate around the Anthropocene calls for moving beyond "traditional engagements with nature and ecology, to interrogations in animal and more-than-human geographies, politics, and sociologies" (Narayanan & Bindumadhav 2019; Hinchliffe *et al*. 2005; Houston *et al*. 2018). Moving beyond the boundaries of nature and culture means conceptualizing animals as beings possessing agencies, subjectivities and as active participants possessing intentionality, that along with humans co-creates the outcomes of a landscape that they inhabit (Kohn 2013; Yeo & Neo, 2010). Drawing from Donna Haraway (2003), Agustín Fuentes (2010, p. 600) uses the term 'natureculture' to reflect upon particular *zones of contact* or multispecies interfaces where humans and non-humans are "simultaneously actors and participants in sharing and shaping mutual ecologies." In other words, borderlands and boundaries are not so much about lines of separation but are rather spaces mutually constructed through the interactions, exchanges and entanglements of multiple species.

Yet, we often see how human dominance over non-humans is established through certain discursive maneuvers. Yamini Narayan's work in Indian cities is a remarkable theorization of this process where she argues that the "socio-political construct of a human/animal binary" in urban spaces creates a new kind of colonialism which results in human imperialism over non-humans and poor (Narayanan 2017, p. 475). Her article (p. 476) examines human actions such as eviction, marginalization, and culling of street dogs as a "co-production of colonialism and informality." Similarly, using a socio-ecological approach in understanding the role of intermediaries in human-macaque conflict, Yeo & Neo (2010) argue that in a given landscape, humans may hold paradoxical positions towards animals where the representation of the animal may also reflect human interest and biases. Another case in point is the work of Ursula Münster (2016) on captive elephants in the south Indian state of Kerala, where the author explores how mahout-elephant relations are shaped not only by individual intimacies but also by acts of mutual violence, entailing danger, risk, and aggression. These paradoxical positions have been reflected in the ethical readings of human relations with the 'awkward' and 'repulsive' animals, arguing that both humans and non-humans living together form 'differential vulnerabilities' to each other (Ginn *et al*. 2014).

In India, understanding these interactions becomes even more complicated, especially with the inherently sacred status of animals in Hinduism (Krishna 2010), and the pluralistic nature of society, which may lead to diverse responses when humans interact with animals. Engaging with the sociocultural and religious dimensions, Narayanan & Bindumadhav (2019) show that human-snake relations in India are manifested through contradictory feelings towards snakes as pests/victims, as killable/nurturable and to be revered/to be demonized. These dualities are a result of the tolerance that human societies develop due to the influence of religion and culture on the one hand, and intolerance due to the purported fearsome and repulsive nature of the animal on the other. Similarly, elephants are also subject to contradictory imaginations. They are widely revered in India, in part due to the mythological and religious importance of the elephant-headed god *Ganesha*, which provides cultural tolerance among Hindu communities. Apart from their religious and cultural significance, in India, elephants (albeit captive) are also used by the Forest Department to capture and corral

problematic bull elephants, for patrolling and hauling operations, as well as for serving as viewing platforms in wildlife safaris (Thomas 2017). Therefore, by virtue of their centrality in Indian mythology, religion, history, and daily life, the Asian elephant (Elephas maximus) is an important icon in Indian culture, occupying a supreme position unmatched by any other animal (Groning & Saller 1999; Sukumar 2003). Further, because of their imposing size, high level of intelligence, and ability to perform a variety of unique functions, elephants invoke awe, appreciation, and endearment. On the contrary, the propensity of elephants to raid crops and visit human habitations in search of food often results in economic loss, loss of property, and even loss of life, consequently invoking fear, anger, and retaliation by means of poisoning or electrocution (Baskaran *et al*. 2011).

Even in our study site and its surrounding regions, prior studies have focused on negative interactions between humans and elephants, such as economic loss due to crop depredation, damage to infrastructure and human mortalities, that translates as 'conflict' (Choudhury 2010; Gubbi 2012; Kumar & Raghunathan 2012; Nath & Sukumar 1998; Rangarajan *et al*. 2010; Williams *et al*. 2001). Yet, the contradictory imaginations of the Asian elephant also influence the complexity of relationships between humans and elephants in our study site. This was apparent when one of the respondents insisted that humans had the major share of the responsibility in remaining safe in what he termed to be an 'elephant habitat': "We have come into elephant's land to earn a livelihood and it's our responsibility to remain safe."

To move beyond the narrow focus on 'negative interactions', an interdisciplinary research approach can help delve deeper into multiple facets of human-animal relationships which have the potential to better 'reframe' and intervene in conflict scenarios (Pooley *et al*. 2016). A lack of understanding of the socio-economic, cultural and historical context in conflict-prone regions may lead to ill-informed policies and conservation interventions which are ineffective for conflict resolution (Knight *et al*. 2008; Mascia *et al*. 2003). Further, as emphasized by Evans & Adams (2018), elephants must also be seen as lively and powerful actors in shaping human-animal relations as well as conservation outcomes, something that is possible only by attempting to understand the lived geographies and realities of these creatures. Therefore, integrating disciplines of social science, ethology, and conservation biology is necessary to bring crucial insights into understanding and managing conservation issues (Bennett *et al*. 2017; Chan *et al*. 2007). So far, most of the work that uses the interdisciplinary approach to address human-wildlife relations has remained conceptual, with limited translations into empirical studies that have an in-depth enquiry into the social, cultural, economic and ecological aspects. There are impressive exceptions (Álvares *et al*. 2011; Carman & Carman 2018; Ghosal & Kjosavik 2015; Goldman *et al*. 2010; Lescureux *et al*. 2011; Banerjee & Sharma, 2022).

Building on the literature that recognizes the contribution of the interdisciplinary approach in reading 'more than conflict' relations (Pooley *et al*. 2017), this study explores human-elephant relations in a cohabited landscape in the Western Ghats of India. It explores the social, cultural and historical context of the study area in order to understand the underlying social and cultural drivers that have the potential to manifest into conservation conflicts. We argue that conflict, though critical, is only one of a diverse set of relations. And when conflicts do occur, our study finds that an individual's gender and unpleasant memories serve as drivers of negative attitudes towards wildlife. Our research also shows how a conservation intervention based on engagement and collaboration with the local people is perceived as highly effective. Preventive and mitigative, rather than reactive conflict mitigation strategies may have a significant role to play in maintaining the social carrying capacity of local communities towards elephants. This study, therefore, adds multiple layers to the extant knowledge of human-elephant relations in the Western Ghats.

Specifically, we address the following questions:

a) how do humans relate to elephants in Valparai?

b) what are the determinants that define attitudes towards elephants?

c) how do residents perceive and engage with conflict mitigation measures when implemented with a participatory approach?

Insights from these enquiries provide a deeper understanding of human-elephant relations in the region and assess the effectiveness of conflict mitigation initiatives implemented with the participation of local

communities. We use a mixed-method approach and analyze our findings with literature across the disciplines of political ecology and conservation biology. Ethnographic methods are utilized to provide rich descriptive insights, while quantitative analysis identifies the underlying drivers of conflict.

2. Materials and methods

Study area

The Anamalai Hills are a range in the Western Ghats of India, situated in the states of Tamil Nadu and Kerala (Figure 1). Anamalai literally translates into "Elephant Mountains" in Tamil. This hill range contains the second-largest contiguous population of elephants in India (Kumar *et al*. 2004) and is also identified as the most important area for long-term conservation of elephants (Leimgruber *et al*. 2003). The hills have historically had high biodiversity with a high density of endemic plant and animal species (Daniels 1992). However, during the widespread clearing of forests in the 18th century for plantations of coffee, tea, and cardamom, the once contiguous landscape which was the natural habitat of the resident elephant population became severely fragmented. During the same period, workers from the plains of Tamil Nadu and Kerala were brought in to work in the estates by the British planters (Congreve 1942; Umapathy & Kumar 2000).

The Valparai plateau in the Anamalai hills is home to two resident, and several other peripheral herds of elephants (Kumar & Singh 2011) which makes it an important area for elephant conservation. The Valparai plateau covers around 220 km^2 of the area and is dominated by large commercial tea plantations and coffee estates with approximately 40 interspersed rainforest fragments (Figure 1). The region is surrounded by the Anamalai Tiger Reserve, the Parambikulam Tiger Reserve, and the Chinnar Wildlife Sanctuary. The plateau also provides a corridor for the elephants to move between surrounding protected areas.

Like the other areas within the Annamalai hills, large parts of the rainforest of Valparai were converted into tea and coffee plantations in the late 18th century. The once contiguous landscape was therefore fissured and delineated into animal protection/dwelling areas in the form of protected areas and human use areas in the form of tea and coffee estates. However, over the years, the elephants of the region adapted and defied this neat cartographic zonation of the landscape. They have learnt to break into food grain stores and feed on fruit-bearing trees. Moreover, during this period humans also became attuned to the constant presence of elephants, and their life began to revolve around the anticipated movement and presence of elephants. The rainforest fragments in the plateau eventually became resting sites for elephants during their movement. Currently, the Valparai plateau is shared between 70,000 humans and 100 elephants (Kumar & Singh 2011). The largest proportion of the human population comprises immigrants from different regions of the states of Tamil Nadu and adjoining Kerala, who work on the tea and coffee estates as field workers, tea leaf collectors, transporters, vehicle drivers, factory workers, office workers, and managers. The frontline estate workers usually live in the settlements which are locally known as 'lines', while the managers and senior staff members live in the factory quarters.

Elephants often come in contact with the human population while moving between the various forest patches and this leads to different kinds of interactions (Kumar & Raghunathan 2013). Between 1994-2012, the negative interactions of elephants and humans in the area resulted in 38 human deaths and it was found that 88 per cent of these deaths occurred due to the absence of information related to elephant presence at specific times (Kumar & Raghunathan 2013). Thus, to help reduce conflict incidents, the Nature Conservation Foundation, a non-governmental organization (NGO) with a rainforest research station in Valparai, initiated the 'Early Warning System' (EWS) program in 2011 across the entire plateau. Earlier studies in the area had documented elephant movement patterns and the extent of loss due to human-elephant interactions and accidents (Kumar & Raghunathan 2013; Kumar *et al*. 2010; Kumar & Singh 2011). However, based on the findings of these studies, the EWS was developed, keeping the socio-ecological understanding of the conflict and involved consultation and engagement of the local community in its implementation.

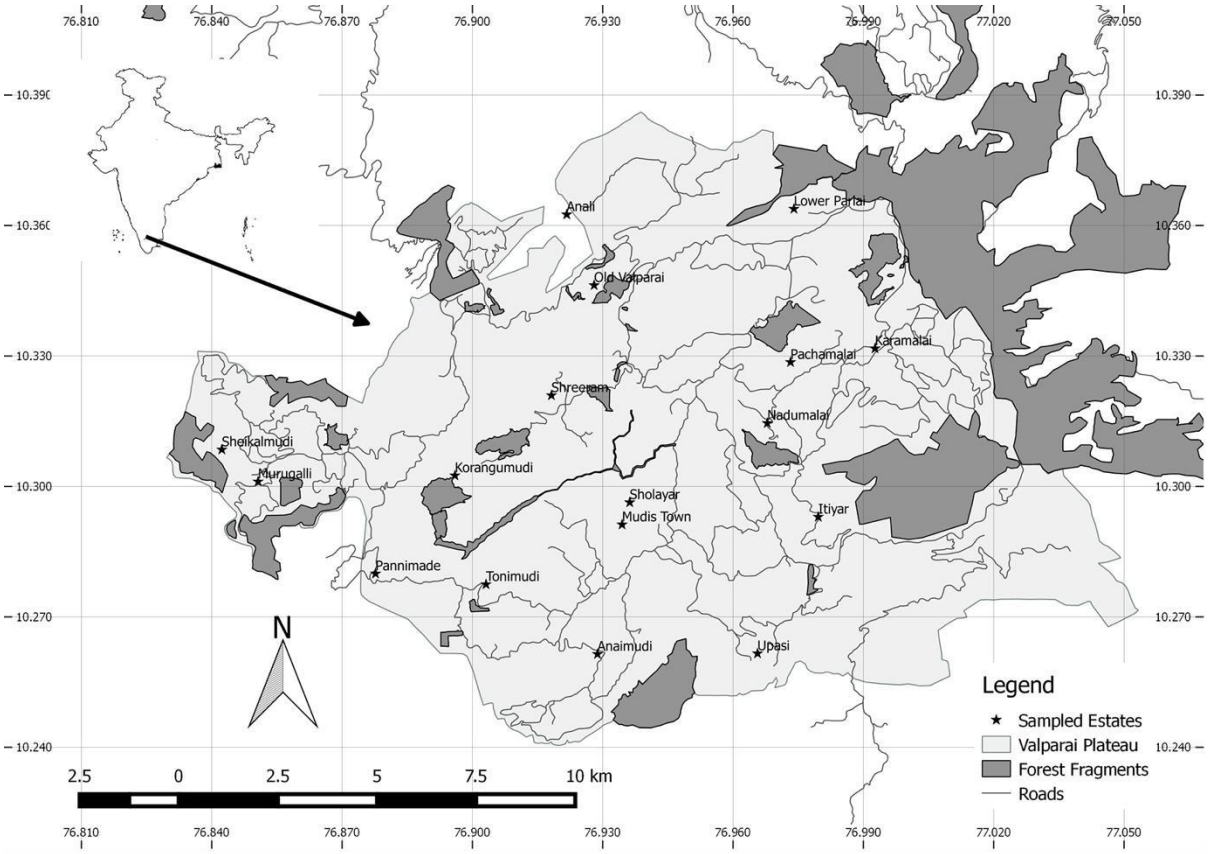

Figure1: Map of study area showing Valparai plateau, sampled estates, and remnants of forest fragments in the Western Ghats. The inset shows the study area in the state of Tamil Nadu, India.

Field methods

The study was conducted ten years ago, between July 2013 and March 2014. Seventeen tea estates that covered almost the entire area of Valparai plateau (Figure 1) were selected using stratified random sampling. These estates included Anali, Anaimudi, Itiyar, Karamalai, Lower Paralai division, Mudis town, Nadumalai, Old Valparai, Pachamalai, Pannimade, Murugali, Shekalmudi, Sholayar, Sriram, Tonimudi, UPASI Tea Research and Korangumudi. At each estate, ten semi-structured interviews were conducted with the estate workers through snowball sampling. Moreover, in each of these estates, two of the tea estate staff members were also interviewed. In three of the selected estates, only one staff member could be interviewed. In addition to this, three residents from the town who were aware of the human-elephant interaction in the tea estate regions were also interviewed. Overall, 204 semi-structured interviews were conducted which included 170 estate workers (89 female and 81 male), 31 estate staff members (all male) and 3 town residents (two male and one female).

Data collection was done with the help of native Tamil-speaking field assistants who were also fluent in English language. The interviews with estate workers were conducted with prior permission from the estate management usually at the time of lunch break in the estates. Interviews with the estate managers and officials were conducted in their respective offices.

Before administering the questionnaire, the interviewees were briefed about the aim of the interview and their consent was sought. The interviews were then initiated with simple queries about animals that people observe around their localities, animals that visit human habitations etc. It was only once elephants were

mentioned that respondents were asked what they thought of elephants in the region, to start the conversations before asking more direct and in-depth questions related to human-elephant relations. The respondents were also queried on their encounters with and experiences of elephants, which included their knowledge about the elephants of the area, and issues they face due to elephants. Moreover, measures used by the respondents to prevent negative interactions were also queried, where most of them mentioned EWS in addition to their own unique measures used to reduce human-elephant encounters. Nevertheless, the respondents were still asked whether they were aware of the conflict mitigation measures implemented in the area and if the measures have been useful in reducing human-elephant encounters. In addition to the information regarding the elephant-human interaction, the age, gender, education, and occupation of the interviewees were also recorded. Amongst the set of respondents, 54 per cent of the respondents were born in Valparai while the remaining 46 per cent were the first generation in the area, emigrated from other regions to work in the tea estates.

Data analysis

Qualitative data from the interview transcripts and related set of notes were analyzed using the content analysis technique following an 'open coding process' – where the data was assembled in blocks and patterns and understood in the context of the indexed text-based dataset (Denzin & Lincoln 2017; Diane *et al*. 1999). This was done in four steps – decontextualization, recontextualization, categorization and compilation (Bengtsson 2016). A master list containing recurrent themes was created that addressed different research questions. This helped in identifying narrative text from the dataset for specific research questions and for coding narratives and phrases (Ogra 2008; Yeo & Neo 2010). While identifying attitudes, special attention was given to the context and tone of the responses. A similar coding approach was followed for quantitative analysis of the factors responsible for negative attitudes towards elephants, where words and phrases and terms were classified under three different categories: positive (+1), neutral (0) and negative (-1).

Descriptive statistics were used to understand people's attitudes towards elephants. An ordinal logistic regression was adopted with attitude as response variable ('positive', 'neutral' and 'negative') and the factors considered were age, gender, education, origin or 'nativity' (living in Valparai for more than one generation) and past experiences. All the data analysis was conducted in R (R Core Team 2017).

3. Results and discussion

Cohabiting a fissured landscape: Relationships between people and elephants

> In 2011, in Periyakallar tea estate, a group of seven to eight women were plucking tea leaves in the estate like any other normal day. They noticed some movement in the adjacent forest patch and figured out that it was an elephant herd. Some of the ladies noticed continuous flapping of ears by the elephants of the herd and thumping of their feet. Despite these warnings, the women continued their activities, thinking that it was still daytime, and the elephants usually crossed the plantation during the evening. They said that they ignored the continuous signs of agitation from the elephant herd and later the herd charged at them. One of the female elephants trampled three women in the ensuing commotion.
>
> The same year, when three drunken men riding a motorbike saw an elephant cross the road, one of them got off the bike and started getting closer to the elephant to touch its feet (for cultural and religious reasons). The man got very close to the elephant, but the elephant did not harm the man at all. However, when he repeated the same after a few minutes, the elephant charged at and trampled the man, killing him instantly.

These stories were some of the retellings which we heard during our fieldwork in Valparai. The quotes paint a picture of a supposed 'borderland' where human and non-human beings, elephants in this case, share time and space along the demarcated boundaries of human territories (Wolch *et al*. 2003). They illuminate

human subjectivities of human-elephant interactions, where flapping of ears and thumping of feet by the elephants are read as signs of agitation, signaling reticence to establish contact with human societies. The same narratives also present elephants as 'trespassers' (Narayanan 2017), who, in the context of the study area, are supposed to traverse human territories only at night. With the help of these vignettes, we can intuit a sense of how people perceive and understand the behavior of elephants, and also how the elephants' behavior is shaped by co-habitation.

This relationship of people with elephants manifested in two ways. First, respondents showed an understanding of the behavior of elephants and a sense of empathy towards them and second, fear arising out of having to share space with elephants where they could see the elephant 'othering', breaking barriers and defying boundaries so neatly defining what constitutes an elephants' forest, and human dwellings.

The respondents often displayed these contradictory responses of care and fear, showing they were afraid of elephants, but also felt concern and empathy for them. "If there is some system or alarm by which elephants will not get harmed and they simply come and go [it] will be really helpful" (37-year-old, Estate worker, hereafter EW). The paradoxical responses by the residents of Valparai appear to be rooted in the tensions between their cultural beliefs and empathy on the one hand, and practical reasons to fear for their own safety on the other. Similar findings of paradoxical positions have been noted in human and snake relations in urban India (Narayanan & Bindumadhav 2019), shaped by the sacred space that the snake holds in the Hindu scriptures on one hand, and the fear that the venomous snake evokes, on the other.

Despite these paradoxical relations, most respondents exhibited empathy, care and concern for the elephants (74% of respondents, n = 172). Respondents believed that even though elephants occasionally caused damage and inconvenience, they belonged to the landscape and had the right to live in it. They mentioned that it is the humans who have invaded the elephant's habitat, causing negative interactions. This can be observed in the following response: "We humans have come in [the elephant's] territory to work and earn money, so it's our responsibility to make sure that we take care of ourselves" (53-year-old, EW, male). These respondents also exhibited an intimate knowledge of elephant behavior and their needs, and showed awareness of the issues and stresses that elephants faced: a relationship of concern. Attractants in the form of fruit, granaries and garbage, an increase in the population of elephants, shortage of food and water in the forests, the loss and degradation of elephant habitat, human disturbance and being troubled by flies were listed as reasons that compelled the elephants to leave their forested habitats and venture into tea estates.

> "Just like us, elephants feel hungry too, they do not have a house as we have and therefore roam in search of food" (37-year-old, EW). "There are three big groups of elephants, and food in the forest is perhaps not sufficient for such a large population of elephants." (53-year-old, EW)

Food resources near human habitations were listed as the single most important reason for elephants to venture near human habitation (Table 1). "We have a small stomach, they [elephants] have a big one, and there is less food in the forest" (47-year-old, EW). The description by the respondents of the issue’s elephants faced, especially while coping with a seasonal shortage of food and water, and anthropogenic stressors could stem from a genuine sense of empathy arising from a shared subaltern perspective. Identifying with the subaltern, the elephant, is captured in the quote, "elephants were always around, but after their forest was chopped away by humans and they were constantly chased and disturbed, they have started chasing humans" (47-year-old, EW). Anthropogenic disturbances to the elephants inside the forest were also perceived as affecting the annual movement route of the elephant herds in the region, as narrated by one of the respondents: "Sabarimala festival causes disturbance to [elephants having home range in Kerala], so they come here [towards Valparai] to avoid that disturbance." The religious and cultural significance of elephants in Hindu mythology predisposes people of Valparai towards greater tolerance towards elephants. But nonetheless, they relate to elephants in a complex and ambivalent manner. The respondents in the region did anthropomorphize elephants: attributing motives and intentions to wildlife species is known to influence people's attitudes as well as their tolerance (Hill & Webber 2010). People exhibit higher tolerance to animals they perceive as similar to themselves (Kansky *et al*. 2016).

Reasons for negative interactions	Sum of responses (NR)	Percent of responses
Attractants near human habitation (fruits, rations, garbage)	67	24
Elephant population increase due to the ban on hunting	64	23
Unsure	51	19
Food & water shortage in the forest	40	14
Habitat loss & degradation	25	9
Fly bites	13	5
Disturbance	11	4
Migratory route	5	2
Lack of fear	1	0
Total responses	*277*	*100*

Table 1: Significant reasons listed by respondents of the Valparai plateau for human-elephant interactions in the study area. N (number of respondents) = 204. NR (number of responses, respondents gave more than one response attributing to reasons of the negative interactions) = 277. Attractants include fruiting trees, food storage and organic waste. Unsure = Respondent not sure of a likely reason. Fly bites = Fly bites inside the forest forcing elephants to come out. Disturbance = Disturbance caused by humans including pilgrimage inside forest areas. Migratory route refers to dwellings that fall on the migratory route of elephants. Lack of fear = Elephants having no fear of humans.

While most of the respondents portrayed multiple ways of relating with elephants in the forms of love, care, concern and empathy, about a quarter exhibited negative attitudes, including feelings of hatred and enmity (26% of respondents, N = 32). Psychological fear, damage to granaries and households, risk of death, and fear of injury and an inability to work (Table 2) were the problems mentioned. They believed that elephant movement should be restricted to forest patches, away from human habitations. These observations revealed a relatively underappreciated dimension of people's relationship with elephants: psychological stress and fear. The hidden effects of interaction with wildlife have been examined in a few studies and are considered to have significant impacts, including diminished psychological well-being and disruption to food and livelihood security (Barua *et al*. 2013; Ogra 2008).

The concerns of the respondents were observed in responses such as, "Because of elephants everything closes by eight pm, and when children come back from their schools late evening, we are always worried about them, never in peace" (32-year-old, EW, female); "We should get some protection from these elephants, otherwise it will get even more difficult with time to live here" (41-year-old, EW, male), and "We are trapped in an elephant place, we do not want animals but they are here, and we cannot do anything about it" (39-year-old, EW, female).

Delving deeper into the interviews reveals a sense of the disentanglement of nature from society, as well as domination over nature (Geisinger 1999). People's imaginations firmly place elephants outside what is viewed as human landscapes. Respondents believed that the 'elephant problem' in the region has arisen due to the ban on hunting of wild animals (23% of responses, see Table 2) where elephant conservation legislation took away from people their rights to manage their landscape. This is captured in the following responses, "Elephant numbers have increased because of the ban on hunting and killing due to Forest Department rules in this place" (57-year-old, EW). "The way animal population is increasing, because of no hunting as it's a reserve area, one day there will be no human but only animals" (38-year-old, EW).

Problems faced by people	Sum of responses (NR)	Percent of responses %
Psychological fear	200	35
Infrastructure damage	180	32
Causes of death	62	11
Causes of injuries	59	10
Inability to go to work	37	6
Crop damage	32	6
Total responses	*570*	*100*

Table 2: Problems faced by local people because of living in proximity to elephants. N (number of respondents) = 204. NR (number of responses) = 570. Causes of death = Respondents attributed to deaths caused by elephants as a significant issue. Causes of injuries = Respondents attributed injuries caused by elephants as a significant issue.

Relations between humans and elephants were multifaceted, but also elephant's behavior seemed to be changing over time. Elephants that used to visit the lines only during the fruiting season, had begun to visit more frequently, especially due to the presence of the ration (food) shops inside buildings.

> "Earlier elephants used to come and eat the banana [but] after rice shops came, they first broke the walls of ration shops and then they started breaking houses. It is only because of ration shops the elephants started breaking buildings. Whenever these ration shops are stocked the elephants get to know through their superior sense of smell and they come and attack. Ration shop is raided 5 times a day sometimes when elephants come one by one" (53-year-old, female, EW).

Respondents also believed that the elephants have become more comfortable with human presence over time as stated in one of the responses: "earlier when animals saw us they would run, but now they do not even move and start chasing us instead" (36-year-old, EW, male).

People in Valparai engaged with elephants in multiple ways. These were ways and forms that Radhika Govindrajan (2018) refers to as 'relatedness'. From her recent rich engagements with interspecies entanglements in the western Indian Himalayas, the author shows how humans in Uttarakhand, living and sharing time and space with both domestic and wild animals cultivate bonds, or what she refers to as 'modes of relatedness.' While these modes of relatedness manifest in the form of family, friendship and kinship ties with non-human animals, relatedness is "decidedly uninnocent", existing even when there is indifference, disgust or hostility towards these animals (Govindrajan 2018, p. 5). Similarly, in Valparai, people formed a multiplicity of relations by cultivating feelings of relatedness in the form of fear, love, care, empathy and even hatred and enmity.

Multiple forms of relatedness have also been depicted in studies by Annu Jalais, in the Sundarbans, where tigers and humans cultivated webs of relatedness with religious roots, having a common symbolic mother and sharing similar harsh environments (Jalais 2014). But what makes the case of Valparai distinct and different is that human-elephant interactions are influenced by cultural and religious beliefs, but equally so, by their respect towards the animals that share the space with them. Respondents mentioned that the elephants in the region crossed the estates during nighttime, except for a few instances when they traversed tea estates during the day. Indeed, studies on the habitat use and ranging of elephants in the landscape show a significant difference between day and nighttime habitat use. Elephants were more frequently recorded in the forest fragments and riparian vegetation in the day, generally avoiding tea plantations in daytime but using them at night to move between rainforest fragments (Krishnan *et al*. 2019; Kumar *et al*. 2010). Respondents repeatedly emphasized that elephants tried to avoid contact with humans by crossing the tea estate at night.

In Valparai, it appears, as highlighted by Govindrajan (2018) in her work, that both humans and elephants recognize "that the rhythms of one's day and, indeed, one's life were caught up with those of another's" (p. 10). Elephants are highly sensitive to the nature, distribution, and timing of risks and opportunities and learn how to respond to them (Evans & Adams 2018). Their regular forays into human-dominated spaces are indicative of their resistance to the human ordering of the landscape into wild and domestic spaces, while their thumping of feet and flapping of ears to warn estate workers of their presence are ways in which the elephants showcase their agency and capacity of emotions and actions to avoid any negative interactions with humans. On several occasions, respondents mentioned that the elephants in the region try to avoid human interaction. The stories of such everyday interactions offer insights into elephant's intentions and portray them as intelligent beings possessing agency. There are opportunities here to engage with more-than-human beings, a form of anthropology that recognizes that "seeing, representing, and perhaps knowing, even thinking" are not exclusive to humans (Kohn 2013, p. 1).

So far, this article has examined the complexities and ambivalence of the relationship between humans and elephants. Another dimension that needs a deeper analysis is the factors that predispose or drive people to harbor negative attitudes towards them. We now turn our attention to one of the forms of relatedness that is of core interest to conservation biology – conflict. We offer a nuanced engagement with the conflictual relations between humans and elephants, the drivers as well as multiple meanings that 'conflict' implies in the study area.

Nuancing conflict: The role of unpleasant past experiences and gender

During in-depth interviews and discussions with respondents, it emerged that terms such as 'conflict' and 'loss' can have very different meanings for an individual based on their socio-economic position and tolerance level. For instance, for the estate workers, damage to infrastructure (mostly houses), injury, or death of fellow workers constituted 'conflict', whereas for estate managers, even "breaking of flowerpots around the bungalows" by the elephants was portrayed as a serious problem. Studies have shown immense individual variation in attitude and tolerance towards wildlife (Kansky *et al*. 2014) where people least affected by wildlife may hold a negative view while people who encounter more problems may still not want to get rid of a species (Marker *et al*. 2003). The nature of conflict in Valparai was also said to have changed over time as expressed in one of the responses, "People have changed now, earlier when I was a kid no one used to irritate animals, now whenever an animal is out, even if it is just crossing a road, people start shouting and making noise, throw stones, burn crackers and this has made animals also a bit dangerous" (47-year-old, EW, female). The mere presence of elephants outside forest fragments was often reported as a 'conflict incident' in the local media, something that has been observed in both the Indian as well as the global context (Barua 2010).

While unpacking the determinants of people's negative attitudes towards elephants we found that, while most respondents expressed positive attitudes (74% of respondents), those who had bad experiences in the past were more negative (40% of respondents) as compared to those who had never witnessed or experienced an unpleasant incident (12% of respondents, where N = 204; No experience = 137, Bad experience = 67) (Figure 2). Also, a higher proportion of men (86%) exhibited a positive attitude towards elephants than women (61%), (N = 204; Female = 90, Male = 114) (Figure 2). Respondents had positive attitudes towards elephants irrespective of their educational levels (N = 204; Graduate (and above) = 32, Below high school = 148, Illiterate = 24). A total of 85% of respondents with no education had a positive attitude towards elephants compared with 80% of respondents who had an education below high school and 84% with an education above high school. Similarly, 81% of non-native and 69% of native residents exhibited positive attitudes towards elephants (N = 204; Native = 110, Non-native = 94). 'Native' in this study is defined as a respondent who is either a second-generation member of the family living in Valparai or has been living in Valparai for more than twenty years.

Past experiences and gender best explained the attitudes of the respondents towards elephants. Past bad experience was found to be the primary determinant of negative attitudes towards elephants (β = -1.55 ± 0.36 SE, Table 3) while age, education, the location of the house and place of birth did not influence their attitudes (Table 3). It was expected that respondents native to Valparai would have higher positive attitudes towards elephants compared to people who have migrated to the plateau from the adjoining states, but results showed no significant effect of origin or nativeness on the attitudes of people (Table 3). Similarly, educated respondents were expected to have a greater positive attitude towards local wild animals (Kellert 1991), but this was not found to be an important factor (Table 3).

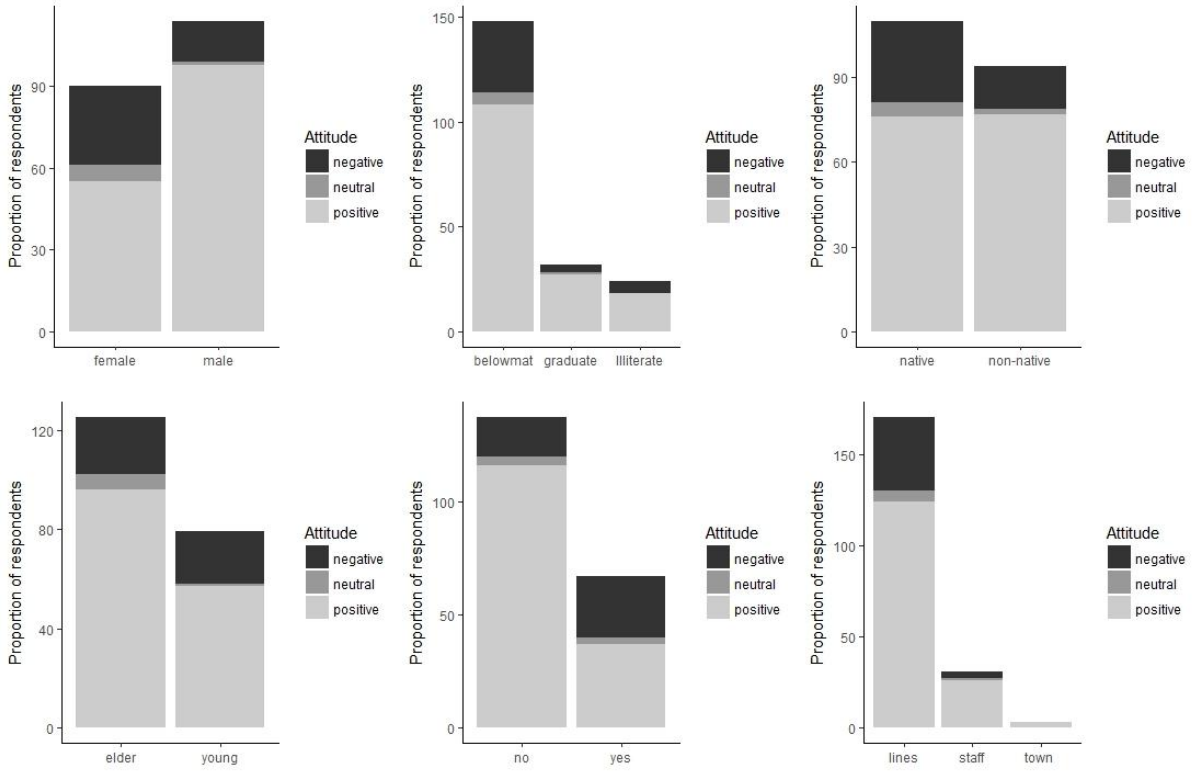

Figure 2: Proportion of respondents exhibiting positive, negative or neutral attitudes towards elephants based on gender, education, origin, age, past bad experiences and job.

Negative attitudes towards elephants seem to be mainly exhibited by the respondents who have witnessed a fatal accident or other unpleasant incidents such as infrastructure damage or human deaths in the past. Most negative responses were identified by respondents from the old Valparai estate (N = 11) and Murugali estate (N = 7). In these estates, there were earlier fatal attacks by elephants. In old Valparai, three women were killed by elephants while working in the tea estate and another person was killed by elephants while he was attempting to chase them away from a rice store. One of the respondents who exhibited an extremely negative attitude towards elephants had faced an incident when elephants had attacked his house while his family was inside. In the lower Parlai estate, several houses were damaged by elephants, and though there was no loss of life, four respondents displayed negative feelings towards elephants which could be linked to unpleasant memories.

As noted, men exhibited a higher positive attitude towards elephants (β = 1.18 ± 0.39 SE, Table 3) than women, which is expected given more women work on the estates than men. Hence, female workers faced a higher risk of encounters with elephants while working or commuting between their homes and the estates. Several studies have reported women's low tolerance towards wildlife due to fear of animals and a higher

burden on them from conflicts (Bjerke *et al*. 2001; Kleiven *et al*. 2004) including increased workloads, decreased food resources, and decreased physical well-being (Ogra 2008).

Variables	Estimate	SE	t value	p value	CI (2.5 %)	CI (97.5 %)
Age (Young)	-0.23	0.37	-0.63	0.53	-0.96	0.50
Sex (Male)	**1.18**	**0.39**	**3.06**	**0.00**	**0.44**	**1.97**
Education (Graduate)	0.18	0.62	0.29	0.77	-1.00	1.48
Education (Illiterate)	0.26	0.57	0.46	0.64	-0.81	1.44
Past unpleasant experience (Yes)	**-1.55**	**0.36**	**-4.28**	**0.00**	**-2.27**	**-0.85**
Nativity (Non-native)	0.37	0.38	0.98	0.33	-0.36	1.13

Table 3: Parameter values of the ordinal logistic regression. Men exhibited higher positive attitudes towards elephants, while people with past unpleasant experiences exhibited negative attitudes. Values highlighted in bold represent factors that had a statistically significant influence on attitudes towards elephants.

People in Valparai do not own any land in the study area; there are tea estates and forest lands. This is an important difference that makes it unique from other conflict sites in India, where people are mostly dependent on agriculture and where conflicts arise primarily due to crop raiding (Gubbi 2012; Madhusudan *et al*. 2003; Sukumar 2003). To help reduce the negative interactions, with the understanding of this uniqueness, a suite of conservation interventions in the form of an 'Early Warning System' was implemented by the Nature Conservation Foundation (NCF). The next section evaluates how the "Early Warning System", designed to prevent unpleasant encounters between humans and elephants was perceived by the respondents.

Early warning system (EWS): A participatory initiative

Extensive research on understanding human-elephant conflict in Valparai found that the absence of information regarding elephant presence was the main reason behind unpleasant and at times fatal human-elephant encounters (Kumar & Raghunathan 2013). An early warning system was thus implemented to reduce unexpected encounters with elephants, incidents of conflict and human fatalities by the Nature Conservation Foundation (www.ncf-india.org), a non-governmental conservation organization. The system hinges on partnering with communities, specifically an elephant informant network to provide information on the presence of elephants in the landscape. This information is then relayed to people using a bulk SMS service to alert them about the presence of elephants in a specific area. The system has also been personalized to send a location alert to people living in the immediate vicinity of an elephant sighting. Another measure includes communicating elephant presence on the local Cable TV network as short snippets or information crawls. In addition, global systems for mobile (GSM) based elephant alert red indicator lights have been installed in strategic locations, 24 of them by 2022, and are remotely operated when elephants are in the vicinity of 1 km of an installation.

This suite of measures is preventive in nature and is being implemented with consultations and partnerships of the affected people as emphasized in "Gajah", a national report of the Elephant Task Force, drafted to help reduce the conflict between humans and elephants in India (Rangarajan *et al*. 2010). Though studies in the landscape documented a decline in the number of negative interactions in the form of property damage and human deaths after implementation (Kumar & Raghunathan 2013), this section of the study was intended to understand how local community perceived the conflict mitigation measures, specifically, since they were co-opted in the planning as well as implementation of these measures.

It was found that all the respondents (100%, N = 204) were aware of the early warning system (EWS) and 97% of the respondents agreed that information provided by EWS helped them avoid unexpected encounters with elephants. Amongst the measures implemented, the respondents perceived the SMS alerts as the most useful measure. More men were found to have received SMS alerts than women, which might indicate a propensity amongst women not to share their mobile numbers or more men using mobile phones than women. The respondents described the SMS as more personalized and specific in conveying information on elephant presence. They also indicated that the ability to carry cell phones with them all the time ensures that elephant alerts reached them instantly, irrespective of where they were. Respondents mentioned that before the implementation of EWS measures, the measures used by the locals were basic – alertness and avoidance, the use of torches, being constantly alert, and avoiding leaving homes after dark in the evening.

We observed the respondents actively participating in the EWS initiative of NCF. Four respondents volunteered to inform the conservation organization about the presence of elephants in their area, in order that the rest of the locals could be informed through bulk messages. Early warning alerts were increasingly carried out by the local community. Respondents also reported that they often called on the mobile numbers to report about elephant presence. The community involvement was found to be increasing in the years preceding fieldwork. On average, 12 enquiry calls per month were received from April 2011 – March 2013 which were in response to a news flash on the Valparai local channel, and 116 calls per month were received between July 2011 – March 2013 in response to the SMS initiative (Kumar & Raghunathan 2013). During interviews, the respondents also made recommendations for improvement of the EWS. These included the removal of shops selling food from settlements, and the setting up of more GSM-based elephant alert red indicator lights in estates with poor mobile network coverage to make the early warning system more effective.

As we can see from these conflict mitigation measures, community involvement in conservation practices makes programs work in a more sustainable way, as irrespective of the law and enforcement, the success of conservation programs largely depends on the attitude of the local community towards the target species (Decker & Purdy 1988; West 2006). Involving the community is an important and effective way for the resolution of human-elephant conflicts and conservation of elephants in a human-dominated landscape (Osborn & Parker 2003). In Valparai, positive attitudes towards the elephants as well as the implementation of conflict mitigation measures with a participatory approach were indeed seen to complement each other.

An update to our fieldwork in the village is provided by Rao (2022). They report that "…49 people and 75 elephants have died while 82 people have been injured between 2012-2013 and 2021-2022 within the 200 square kilometre area due to these conflicts." But, "the last human death was reported in June 2021, and since then, the conflicts have reduced almost completely." Television information on daily tracking of elephants has remained, reaching 5,000 families, as has the bulk SMS service in English and Tamil. The mobile-operated LED-light alerts are still in place in 24 locations.

A global review of the human-elephant conflict mitigation measures shows a variety of other approaches that rely on repellent methods, physical barriers, compensation schemes, translocation and even killing of the 'problem animal' (Nelson *et al.* 2003). However, every conflict site has its specific character and hence a generalized approach to mitigate conflict is unlikely to work in every situation. Identifying specific issues in a particular area and designing innovative approaches that may reduce conflicts is most effective (Rangarajan *et al.* 2010). A conflict mitigation strategy thus can be expected to succeed only if it carefully considers the landscape-specific ecology and behavior of elephants and allows the participation of affected communities in the planning and implementation of interventions (Rangarajan *et al.* 2010). The EWS measures implemented in the study area combine elephant research, a deep understanding of the local socio-ecological context, the involvement of local communities, and innovative use of technology. This explains why these measures have been successful over a decade in mitigating conflict and are perceived by affected communities as useful.

4. Conclusion

This study has provided an empirical contribution to studies of human-elephants relations in the Western Ghats region, highlighting multiple relations that residents of Valparai share with elephants. These include a range of feelings including, empathy, concern, care, and fear and enmity. It has portrayed a far more multifaceted relationship between people and elephants than is projected in the media or even in the human-

wildlife conflict literature for the region. We have shown the cultural and religious importance of elephants in the region, and the respect that people hold for other beings that share the space with them.

While exploring the different 'modes of relatedness' in human-elephant relations, our study also brings to the fore the many entanglements of humans and non-humans on the Valparai plateau. Drawing from Collard (2012), we use the term 'entanglements' for the following reasons. Firstly, 'entanglements' captures the messiness of human characterizations of elephants – they are beasts of the wilderness but also the incarnation of god; they are glorified in culture but also rejected from farms. Secondly, 'entanglements' create a picture of a tangled web of objects – elephants and humans, protected areas and human-use areas, plantation estates and food stores, local communities and NGOs, elephant informants and Early Warning Systems. Thirdly, 'entanglements' denote "countless processes of domination and resistance" (Sharp *et al*. 2000, p. 1) – often interpreted as 'conflict' – between humans and non-humans, that produce dwelt spaces that are inherently biopolitical. As biopolitical actors, humans and elephants, through their everyday practices of cohabitation, constantly challenge the boundaries between human-animal and nature-society, thereby accentuating their porosity (Collard 2012). Alongside humans, elephants have co-created the histories and politics of the landscape through their physical presence, ecology, behavior, subjectivity, and portrayal in human culture (Evans & Adams 2018).

Cohabitation in the Valparai plateau can be interpreted as a fraught endeavor for both humans and elephants as they dwell in a seemingly conflict-riven landscape (Barua 2014). However, while we recognize conflict to be critical, our study shows that it is only one of the several aspects of human-wildlife relations. In terms of factors contributing to negative interactions, though gender has been identified as an important determinant of attitudes towards wildlife in prior studies, our study highlights the importance of past experiences and unpleasant memories in influencing human attitudes towards elephants. Relations between humans and elephants were not only multifaceted but also seemed to be changing with time. These results have several implications for conflict mitigation strategies, such as the need for increased focus on the safety and well-being of the female estate workers who perhaps bear a disproportionate burden of the consequences of living with elephants.

Residents of Valparai were largely empathetic towards elephants, and implementation of conflict mitigation measures has eventually helped in reducing the chances of negative encounters. These were the most important factors driving negative attitudes towards elephants. Documenting local knowledge and perception of conservation measures can help people feel more engaged, and may help in improving the efficacy of conflict mitigation measures.

Studying the production of conflict in detail and situating it in specific social-ecological contexts is important, leading to a closer identification of the factors that cause negative interactions, and guiding the design of appropriate interventions. A holistic understanding of human-animal relations in the Indian and South Asian context should reliably inform mitigation actions and policies. This is even more important in situations where conservation and conflict management plans include awareness programs to help reduce conflicts. Also, preventive and mitigative conflict mitigation strategies such as EWS may have a significant role to play in maintaining positive attitudes of the local communities towards elephants as opposed to reactive strategies. Involving people in the implementation of conflict mitigation measures was successful in Valparai.

If there is a presumption of 'conflict' in the spaces where humans and elephants cohabit, then research may be biased and can fail to capture the multifaceted and sometimes ambivalent ways in which people relate to wildlife. Besides human-centric concerns, we acknowledge that elephants have lifeworlds of their own (Rutherford 2018), possessing subjectivity, agency, and intentionality, and are not just active but also equal participants in human-animal relations (Yeo & Neo 2010; Govindrajan 2018). Therefore, exploring the life histories, moods, behaviors, personalities, and lived geographies and realities of the elephants themselves is imperative (Lorimer, 2010; Mumby & Plotnik, 2018). In closing, we suggest employing a combination of quantitative and qualitative approaches that are multidisciplinary in nature, for a more nuanced understanding of human-wildlife relations, that could potentially lead to newer forms of cohabitation. Drawing from Evans & Adams (2018), mutually respectful cohabitation and multispecies flourishing will require a clear understanding and acceptance of the needs of both humans and animals.

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