FROM ELEPHANTS TO A CHAT GROUP: TRACING MORE-THAN-HUMAN NETWORKS IN SRI LANKA'S HUMAN–ELEPHANT CONFLICT

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Abstract: Human elephant conflict research in Sri Lanka is marked by a divide between ecological studies that pursue objectivist aims such as tracking elephant movements and socio-cultural studies that focus on perceptions, governance, and lived experience, a separation that persists even when these approaches are described as integrated. This study applies Actor Network Theory (ANT) to a 2023 case in Puliyankulama, where a fatal elephant encounter set in motion a series of events that led villagers to establish a WhatsApp group for real time alerts. Using ethnographic observation, interviews, and media analysis, the study traced human and non-human actors as they shaped the evolving response network. Findings show that the WhatsApp group became a vital communication link enabling faster sharing of elephant movement information, while at the same time creating new issues such as the spread of sensitive personal details and declining trust among participants. These contrasting effects emerged from the same shifting socio technical ecological network that produces the conflict itself. By making these cross domain connections visible without reducing them to a single frame, the study offers conservation research a way to examine integration challenges in complex settings. The paper contributes by providing an ANT informed re description of a real time conflict event, showing how digital infrastructures become active participants in producing safety, risk, and governance, and offering design and conservation practitioners an descriptive frame that foregrounds relational complexity rather than fixed categories or linear explanations.

Keywords: *Human-Elephant Conflict; Actor-Network Theory; Socio-Technical Systems; Digital interventions; Non-human agency*

1. Introduction

Human–elephant conflict (HEC) is not, despite the name, a straightforward clash between two species. It never was. What we call 'conflict' is a shifting network of actors that includes elephants, humans, forests, irrigation tanks, mobile towers, WhatsApp servers, ministries, coffins, deities, and the everyday routines of people trying to sleep through the night. Yet HEC is often approached as if these worlds were distinct with nature on one side, culture on another, and technology pushed to the margins. In Sri Lanka, where settlements increasingly overlap historic elephant corridors, this separation is more than an academic oversight. It distorts how the problem is defined and what counts as a solution. This divide shapes how the problem is defined, how it is understood, how it is addressed, and what counts as a solution. Digital technologies, often treated as common interventions or solutions, can in fact deepen the divide. Whether a GPS collar strapped to an elephant or a mobile alert flashing on a villager's phone, these devices are not neutral add-ons. They reconfigure vigilance, reshape perceptions of elephants, and determine; sometimes literally, who is in danger and who is not. Yet most HEC research on technology asks the same narrow question: does the tool work, or do people bend it to local needs? Between these two answers lies the bulk of reality, and it remains largely invisible in the way we approach HEC. This paper works in that invisible ontological space of HEC. We present a case from Puliyankulama in 2023, where a villager's death triggered a road protest, national media attention, government directives, and the rapid creation of a WhatsApp group for real-time elephant alerts. Rather than starting with fixed categories like "technology," "community," or "nature," we follow how these categories themselves were assembled and transformed through a network of humans, non-humans, infrastructures, institutions, and artefacts. Actor–Network Theory (ANT) provides the descriptive method for this work that was developed within Science and Technology Studies. ANT resists privileging one domain over another. In doing so, ANT reveals not only the visible successes of interventions but also the hidden mediators and fragile alignments that make them possible or cause them to fail. To make this analytical direction explicit, this study asks: (1) How do human and non-human actors assemble and reconfigure themselves during a human–elephant conflict intervention? (2) How does the introduction of a digital alert system, here, a WhatsApp group negotiate vigilance, responsibility, and risk within the community? and (3) What hidden mediators, translations, and alignments become visible when HEC is analyzed through an ANT lens rather than through pre-given categories such as "technology," "community," or "nature"? We begin with a review of HEC scholarship across ecological, socio-cultural, and hybrid approaches, showing how each retains traces of the nature–culture divide. We then turn to the Puliyankulama case, using ANT to follow the actors, translations, and mediations that shaped both the intervention's emergence and its eventual tensions. This paper contributes to HEC research in three ways. First, it offers an ANT-informed re-description of a real-time conflict event, making visible socio-technical and material mediators that conventional approaches overlook. Second, it demonstrates how digital infrastructures such as WhatsApp become active participants in the production of safety, risk, and governance. Third, it provides design and conservation practitioners with

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an alternative analytical frame, one that foregrounds relational complexity rather than assuming fixed categories or linear causality.

2. Literature Review

Research on HEC reflects a persistent conceptual divide, or more specifically, an ontological separation, that treats the components of reality as belonging to fundamentally different categories rather than as parts of an interconnected whole. Much like the term human–elephant conflict itself, which frames the phenomenon as a binary between two entities, studies often reproduce this split. The scholarship of HEC is mainly clustering into what we label as the elephants' sphere (nature, scientific, or positivist) and the humans' sphere (cultural, sociological, or interpretivist), with a more recent complex sphere emerging to mix the two. This is more than just a convenient way of organizing research as it mirrors the very ontological split embedded in conservation thinking, where "nature" and "culture" are treated as distinct domains. This is not unique to HEC but a common underlying problem of modern thinking as Latour (1993) states. The boundaries of these spheres are reinforced by disciplinary traditions and methodological choices. The nature sphere privileges objective measurements and ecological modelling, while the cultural sphere privileges subjective interpretations and social meaning. Complex or hybrid approaches attempt to bridge these domains, but often retain their phantoms of underlying separation.

2.1. ELEPHANTS, NATURE AND SCIENCE

On one end, the nature sphere treats HEC primarily as a quantifiable ecological problem. In Sri Lanka, GPS/radio collars, remote sensing, and habitat modelling have been used to map elephant distribution, movements, and conflict exposure. For example, the first country-wide distribution based on a 5×5 km survey (P. Fernando et al., 2021a; Gunawansa et al., 2023) and GPS-based assessments showing why widely used interventions like translocation often fail to reduce conflict (P. Fernando et al., 2012). Seasonal crop-raiding and movement into human-dominated areas have been documented and linked to cropping cycles and resource availability (C. Fernando et al., 2023). Predictive hotspot mapping methods are now common in conservation, and "crime-mapping" has also been used to target high-risk zones (Chen et al., 2016). Applied economics work has estimated damages and weighed intervention costs and benefits in the Sri Lankan context (Bandara & Tisdell, 2005).

While these studies generate high-resolution, standardised datasets that are invaluable for targeted interventions, they also reveal recurring limitations. The strong emphasis on biophysical indicators and monetary loss can marginalise governance issues, cultural significance, and local knowledge systems. For example, "technically optimal" fence alignments, derived from spatial modelling, may be socially contested, with communities resisting or dismantling them due to livelihood disruption or distrust in state agencies (Gunaratne & Premarathne, 2006). Effectiveness is typically assessed in narrow technical terms such as reduced crop-raiding incidents, while overlooking questions of community acceptance, long-term equity, and the distribution of benefits or burdens. Furthermore, economic valuations of damage and deterrents rarely capture the elephants' symbolic or spiritual importance, which can influence community tolerance levels (Barua, 2013; Jadhav & Barua, 2012). This reductionist framing risks producing interventions that are technically sound but socially unsustainable, limiting their long-term viability.

2.2. HUMANS, CULTURE, AND SOCIOLOGY

The cultural sphere centers on human values, lived experience, and political history in shaping Human–Elephant Conflict (HEC). Early survey work by Perera (2009) reviews the status and mitigation across Sri Lanka, noting that local perceptions of elephants and trust in management institutions vary significantly across regions, variation pivotal for understanding both tolerance and conflict. Similarly, Fernando et al (2005) compare two settlement zones with distinct land-use histories: Kahalle and Yala, demonstrating how traditional land practices and ecological landscape mosaic facilitated co-existence in one region but exacerbated conflict in the other. A more integrated perspective emerges in De Silva & Srinivasan's political-ecology approach (2019), which uses everyday observations, interviews, and spatial analyses to show how human-elephant conflict is embedded within colonial-era land transformations, governance systems, and evolving cultural narratives. Beyond conventional studies, multispecies ethnography and ethno-elephantology push deeper. Locke's (2017) work challenges human-centred ethnography by attending to affective bonds with elephants—treating them as moral agents within intimate human-animal networks. Meanwhile, Kopke et al. (2021) critiques dominant explanations of HEC in Sri Lanka for neglecting socio-economic and cultural vulnerabilities; the study links elephant mortality and human hardship to underlying structural inequities and urgent mental health impacts in rural communities.

While these cultural accounts offer invaluable depth, they again share notable limitations. Most studies remain localised, focused on specific regions or communities, which limits generalisability across diverse Sri Lankan contexts. Many lack systematic linkage to ecological or spatial data, constraining the ability to connect cultural narratives such as ritual, trust, or land memory to elephant movement patterns or geographic hotspots identified in ecological research. Translating these insights into practical interventions is often slow or contested; deeply ingrained historical grievances and institutional mistrust can block community-based solutions from scaling. Finally, sociological, anthropological, and political ecology research often remains siloed, each speaking different disciplinary languages, thus impeding cumulative knowledge-building and integration into policy frameworks.

Despite their domain differences, the nature and cultural spheres share a deeper limitation that makes them difficult to reconcile. Each operates within its own epistemic schema and language. The nature sphere speaks in the register of matters of fact, quantified movements, economic costs, and spatial models while the cultural sphere speaks in terms of matters of concern: qualitative historical grievances, moral relationships, and political struggles. These are not merely different topics but different modes of constructing reality, each producing its own evidentiary standards and priorities. As a result, collaboration between the two often falters, not because their insights are irrelevant to one another, but because they are expressed and valued in fundamentally different ways. This divergence reinforces the ontological split between nature and culture, making it harder to design collective solutions that can accommodate both the technical requirements of mitigation and the social legitimacy necessary for long-term coexistence.

Table 1: Comparison of bifurcated approaches

Sphere	Typical Focus	Strengths	Common Limitations
Elephants' Sphere (Nature Sphere)	Ecology (movement, habitat use, population dynamics), applied economics (loss valuation), crime science (hotspot mapping)	Produces high-resolution, standardised data; informs targeted interventions; enables spatial prediction	Risk of reductionism; may overlook governance, culture, and local meanings; narrow technical definitions of effectiveness
Humans' Sphere (Cultural Sphere)	Sociology (perceptions, tolerance), anthropology (symbolic and cultural meanings), political ecology (governance, historical context)	Captures lived experiences, power relations, and cultural values; situates HEC in a historical and institutional context	Findings often localised; integration with ecological data inconsistent; translation to operational measures can be slow or contested
Hybrid Approach	Interdisciplinary socio-ecological approaches, coupled human–natural systems, participatory mapping, co-management frameworks	Acknowledges multiple drivers; more holistic management plans; fosters cross-disciplinary collaboration	Often retains nature–culture split; integration can be partial; resource-intensive; reliant on sustained governance capacity

As a reaction to the entrenched subjective–objective divide, the complex approaches emerged drawing on interdisciplinary and socio-ecological theories to bridge nature and culture. In Sri Lanka, country-wide mapping tied to management planning (P. Fernando et al., 2021b), has been combined with participatory and governance-aware interventions such as collaborative fence maintenance, co-management agreements, and community-based seasonal fencing schemes. These approaches resonate with broader conservation-conflict scholarship framing HEC as a "wicked problem" requiring coupled human–natural systems perspectives (Redpath et al., 2013; Shaffer et al., 2019; De Silva & Srinivasan, 2019b).

Although such approaches are often portrayed as more holistic, they are not without limitations. Many interdisciplinary projects end up layering ecological and social datasets without fully questioning the conceptual separation between nature and culture, inadvertently preserving the divide they set out to bridge. In practice, human actors often remain the analytical centre, while elephants, infrastructures, and technologies are treated as static background conditions rather than dynamic participants in the conflict. Implementation of these approaches is also resource-intensive, requiring sustained funding, long-term institutional support, and cross-agency coordination, all of which can be difficult to maintain in politically and economically volatile contexts. Finally, the push towards interdisciplinarity can encounter epistemological frictions, where different disciplines' assumptions, methods, and validation standards hinder genuine integration.

Recognising these limitations calls for an approach that can travel across the varied terrains of ecological data, cultural meaning, and technological systems without privileging one domain over the others. Actor–Network Theory (ANT), developed in Science and Technology Studies by Bruno Latour, Michel Callon, and John Law, offers a descriptive approach that avoids privileging any entity or domain in advance. ANT proposes that all phenomena arise from heterogeneous and dynamic networks of relationships between various actors, including humans and non-humans (Law, 2007). Four methodological commitments of ANT guide its application here: agnosticism—suspending assumptions about which actors matter most until their roles are empirically traced; generalised symmetry—applying the same analytical vocabulary to humans, non-humans, material objects, and symbolic entities alike; free association—following any connection that emerges, regardless of disciplinary or ontological boundaries; and translation—the process by which actors shift roles, meanings, and alignments as they connect with others. These concepts provide the lens for the Puliyankulama case, enabling us to trace elephants, villagers, infrastructures, political actions, and religious practices within the same shifting network, and to understand how the categories of "technology," "community," and "conflict" are themselves outcomes of these relations. What follows applies these ANT lenses to trace the Puliyankulama events as a single shifting network rather than as separate social, ecological, or technological incidents.

3. Methodology

This study adopts a single case study approach informed by ANT to move beyond the epistemological divide that often shapes research on human elephant conflict. The Puliyankulama incident was selected as an embedded case because its events unfolded over a short and traceable period, involved a locally created digital intervention that evolved over time, and brought together material, symbolic, and infrastructural elements that cut across ecological, social, and technological domains. The researcher had direct access to the locations, families, and infrastructures involved, allowing close observation of how conflict and response practices were assembled in situ. Fieldwork took place between August and September 2024 following a phased process that began with a pilot study to identify elephant pathways, key sites, and families most frequently affected. Ten households were then selected based on proximity to elephant corridors, engagement with mobile communication technologies, socioeconomic diversity, and willingness to participate, ensuring that participants were familiar with both the environment and the events under study. Data collection combined in depth interviews, ethnographic observations, and artefact analysis. Unstructured interviews lasting between 45 and 90 minutes documented personal accounts, communication practices, and significant incidents, supported by field notes and conducted in participants' homes. Observations were carried out during the rainy season when elephant activity in the village increases, allowing direct documentation of environmental conditions and behavioural responses. Artefact analysis covered photographs, screenshots, and digital traces from the locally formed WhatsApp alert group, along with television news coverage, newspaper articles, social media posts, and site visits to record physical features such as roads, protest locations, and elephant movement routes.

ANT served as the descriptive framework that guided the tracing of human and non-human actors without privileging any domain in advance, mapping associations, identifying mediators and translations, and coding events and objects to understand how agency was distributed across the network. However, in using the theory, this study leans more toward later developments of ANT, which do not rely heavily on the classic vocabulary such as problematisation, black boxing, or spokesperson (Harman, 2014). By organising the description around sequences of interaction rather than fixed categories, this approach captures both the strengths and the limitations of the intervention as outcomes of the network itself.

4. The Case of "Elephants, Coffins and WhatsApp Messages"

On the night of 17 September 2023, Sunil (Anonymity has been maintained by using a pseudonym for the individual who died in the incident.), a 55-year-old farmer in Puliyankulama, was fatally attacked by an elephant while investigating crop damage near his home. His wife's call to the 1990 ambulance service. Before the 1990 ambulance service could arrive, villagers had already gathered at Sunil's residence. The incident heightened tensions over the ongoing elephant–human conflict, prompting the crowd to launch a protest.

The next day, villagers blocked the main road with Sunil's coffin, forcing traffic to a standstill and attracting television and print media coverage. This highly visible act prompted the drafting of a formal complaint to the Divisional Secretariat, which in turn sent an official request to the Department of Wildlife, urging action to address the persistent challenges faced by the village. Within days, a villager created a WhatsApp group for real-time elephant alerts. Initially intended for immediate warnings, it evolved into a broader community coordination tool. By late 2023, the group had over 250 members, multiple self-appointed administrators, and emerging rules for message content and conduct.

The literature review showed that existing HEC research is constrained by three main tendencies: the nature sphere's narrow technical framing, the cultural sphere's human-centred accounts, and the hybrid sphere's tendency to layer datasets without dissolving the nature–culture divide. Each approach captures important dimensions but risks leaving key connections invisible, particularly the relational processes through which actors assemble, stabilise, and transform conflict responses. Actor–Network Theory addresses these limitations by adopting what Latour (2013) calls an "all-terrain" approach: moving fluidly across ecological, social, and technological landscapes without privileging one in advance, and treating all actors, human, non-human, and material as potentially significant.

An ANT inquiry on HEC should begin by asking a different set of questions about the incident. ANT's methodological assumptions: agnosticism (no actor or domain is privileged at the outset), generalised symmetry (the same vocabulary applies to humans and non-humans), and free association (following any connection that emerges) invite research questions that are rarely posed in conventional HEC work (Gould, 1992). Instead of asking "Was the WhatsApp group effective in reducing elephant encounters?", ANT asks "How did elephants, mobile network coverage, protest actions, and community norms together produce this communication system and how do they continue to shape it?" Instead of asking "What factors caused the protest?", it asks "How did a coffin, a main road, media crews, and a crowd of villagers align to transform private grief into public disruption?" These shifts move the analysis away from isolated cause–effect chains toward tracing the assemblage of relationships that make events possible or impossible. (see comparison of questions in Table 2)

Table 2 Comparison of questions

Conventional Research Questions	Limitations	ANT-Informed Research Questions
What factors contributed to the formation of the WhatsApp group after Sunil's death?	Treats factors as separate causes and often prioritizes human decisions; may overlook the relational and emergent nature of network formation.	How do the interactions among humans, elephants, technologies, and institutional actors coalesce to produce the WhatsApp group as a socio-technical network?
To what extent has the WhatsApp group been effective in mitigating human-elephant conflict?	Treats technology as a discrete tool with measurable outcomes, detached from socio-cultural and ecological contexts.	How do the WhatsApp group's practices, technological affordances, and socio-ecological interactions co-produce notions of risk, safety, and community response?
What role do local communities play in adopting and managing digital communication tools?	Assumes stable, bounded communities with fixed roles, neglecting the fluidity of social and technological networks.	How are local actors, technologies, and non-human entities continuously negotiating and reconfiguring the boundaries, authority, and functions of digital communication networks?
How can technology be improved to better address human-elephant conflict?	Presumes technology as an external solution separate from the conflict's complexity, ignoring its entanglement within socio-natural networks.	In what ways does the WhatsApp group operate as a socio-technical assemblage that both shapes and is shaped by the ongoing dynamics of human-elephant interaction?

4.1. TRACING ALL ACTORS

ANT then focuses on tracing what it recognises as actors. In ANT, actor is anything that makes a difference within a network. An actor is defined by its ability to act (do things) in the network and includes people, tools, machines, natural entities, words, institutions, laws, and anything whose absence would lead to a different outcome or social reality. In the Puliyankulama case, actors included not only Sunil, the elephant, and his neighbours, but also the coffin used in the protest, the asphalt road it blocked, the journalists who arrived to film, the mobile towers transmitting WhatsApp alerts, and the Meta servers hosting those messages. Together, these elements formed an actor-network: a temporary, shifting configuration whose stability depended on continuous work. The WhatsApp group itself was not an isolated "tool," but a hybrid object whose function was co-produced by elephant movements (which triggered alerts), app affordances (forwarding, image-sharing), mobile signal strength (determining timeliness), and community practices (who posted, who verified).

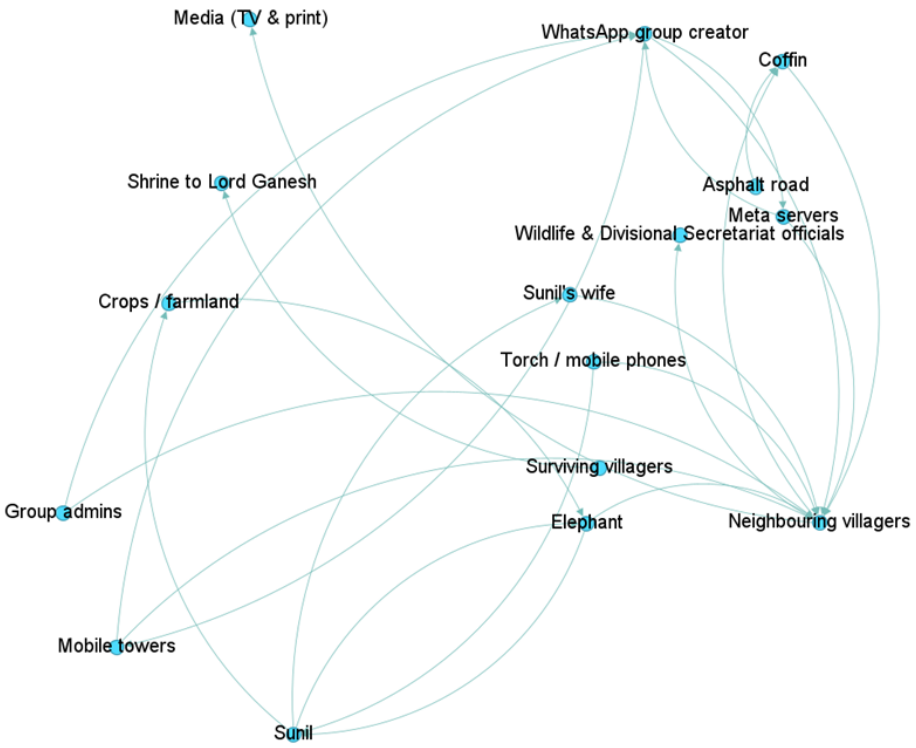

Figure 1. A textual and diagrammatic actor-network map showing human, non-human, and technological actors related to the incident. *(Source: Author)*

Figure2. Villagers protesting on the road with Sunil's coffin
(Source: YouTube - https://www.youtube.com/live/0nv5HzfE66w?si=uVJwhSQhNv3Y0hNU)

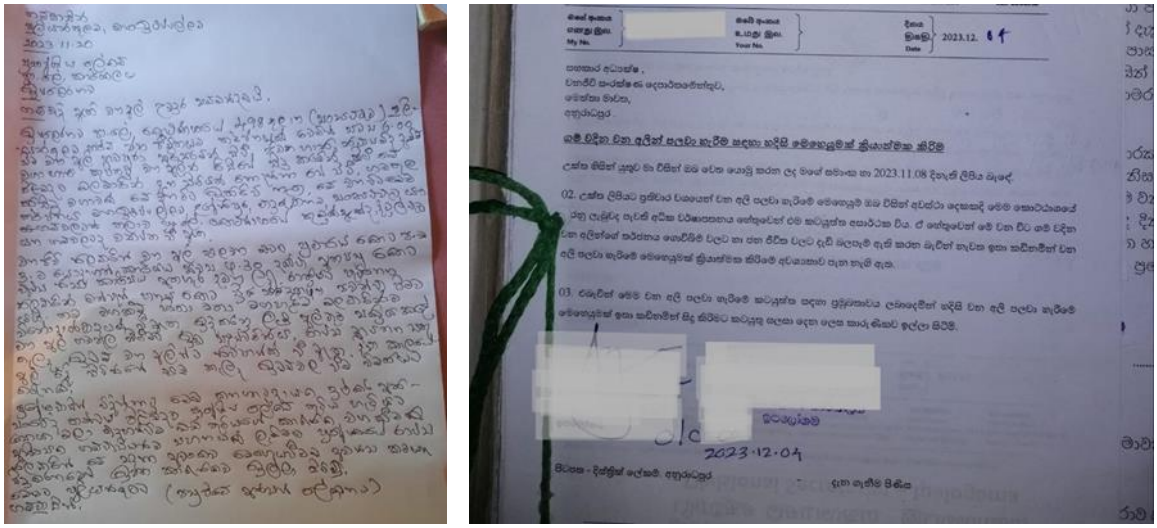

Figure 3. Letters sent by the villagers to the Divisional Secretariat and the Divisional Secretariat to the Wildlife Conservation Department
(Source: WhatsApp group)

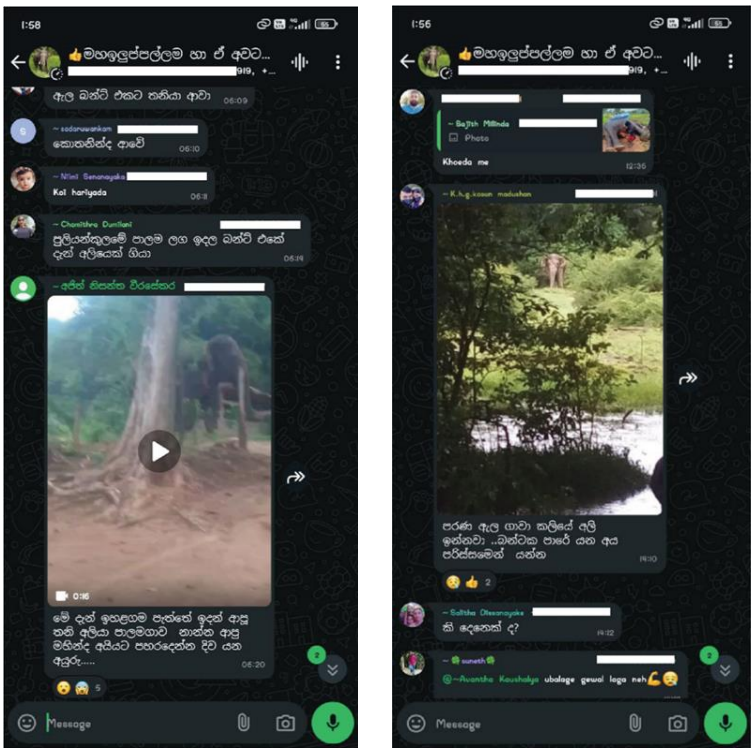

Figure 4. Screenshots of media shared informing elephant intrusions
(Source: WhatsApp group)

For instance, one man who survived an elephant encounter made a vow to Lord Ganesh, worshipped in elephant form to protect his life by building a shrine for the deity. When the shrine was completed, it became a place of worship for the villagers. In a conventional nature-focused study, the inquiry would likely stop at the elephant's behaviour, leaving the shrine to sociologists or psychologists. ANT, however, can move across these terrains. Following Latour's argument that it is a mistake to attribute religion solely to the mind and science solely to external reality, ANT treats both as matters for empirical tracing (Smith, 2016). In this case, the shrine, the messages, and the replies the man received are all part of the same network. God Ganesh gains agency through their alignment with other actors: the wild elephant whose attack prompted the vow, the god in elephant form, the physical structure of the shrine, other existing shrines in the area, and even the small pendants of Ganesh worn by residents as actors of the event. By bringing these elements into the same ontological plain, ANT captures the interplay of material, symbolic, and ecological actors that other approaches would separate into different disciplinary domains.

Figure 5. Shrine of Lord Ganesha built by the man
(*Source: Author)*

4.2. TRANSLATION AND MEDIATION

In the eyes of ANT, no actor-network is inherently durable or weak; rather, networks gain their stability through translations and mediations within their relationalities (Bueger & Stockbruegger, 2016). Translation refers to the process by which actors change roles, meanings, or alignments as they connect with others (Akrich & Latour, 1994). For instance, in Puliyankulama, the coffin used in the protest offers a clear example. The sequence began with Sunil's death, itself the outcome of multiple prior alignments: the elephant's movement through farmland, the crops that drew it in, the absence or failure of deterrents, and the decision of Sunil to step outside with a torch. The fatal encounter triggered new connections between grief-stricken family members, neighbours, and the wider village. The coffin, initially a private container for mourning, entered the network of public action when villagers decided to carry it to the main road. At that moment, translation occurred: the coffin ceased to be solely a funerary object and became a political device with agency. It mediated between the local tragedy and the broader apparatus of governance by blocking traffic, forcing travellers and transport operators into the situation, attracting journalists, and compelling state officials to acknowledge the incident.

Table 3 A timeline of translations and realignments capturing the sequence of key events from Sunil's death to the establishment and use of the WhatsApp group.

Date	Event	Actors Involved	Translation / Mediation Effect
17 Sep 2023	Elephant attacks Banda	Sunil, Elephant, Crops, Torch	Elephant's movement triggers human attention; death becomes catalyst
17 Sep 2023	Wife calls 1990 ambulance	Sunil's wife, 1990 service	Early warning; mobilizes neighbours
17 Sep 2023	Villagers gather	Neighbours, Sunil's family	Creates local social network, immediate response
18 Sep 2023	Protest with coffin	Villagers, Coffin, Road, Media	Coffin translated into political device; blocks traffic; attracts media
18 Sep 2023	Formal complaint drafted	Villagers, Divisional Secretariat	Private grief → formal administrative action
20 Sep 2023	WhatsApp group created	Villager (creator), Mobile network	Digital coordination network emerges from social & ecological events
Oct – Dec 2023	Group expansion	Admins, 250 members	Rules, trust, content norms established; network stabilizes

2023–2024	Ongoing alerts & misuse incident	Members, WhatsApp, Meta servers	Continuous translation & mediation; rules adjusted to realign network

Having understood how the agency of a seemingly small object like the coffin emerges through translation and mediation, we can move to the WhatsApp group. The same ANT description applies, both to its formation and to its ongoing function. The group's origin was not a result of a technological decision; it was the outcome of a chain of translations linking Sunil's death, the public protest, the resulting media attention, and the pressure placed on local authorities. The decision by one villager to create the group was shaped by these earlier alignments, as well as by the presence of mobile phones, the availability of a stable enough network signal, and the cultural familiarity with WhatsApp as a tool for coordination. In this way, the group was translated from a general-purpose messaging app into a dedicated alert system for elephant sightings.

Its ongoing function likewise depended on continual mediation. Every message posted altered the network: a sighting report might mobilise a group of villagers to chase elephants away, prompt others to stay indoors, or spark debates about the accuracy of the information. The timing of these effects hinged on mobile tower coverage, the credibility of the sender, the affordances of the app (such as image-sharing or location pins), and the responsiveness of community members. The WhatsApp group also mediated between different scales, linking distant Meta servers in the United States to immediate, on-the-ground responses in Puliyankulama's fields and roads. As with the coffin, the group's capacity to influence events was not inherent in the technology itself. It emerged from its position in a constantly shifting network of human actors, non-human actors, and material infrastructures. Its stability depended on regular participation, trust among members, and the maintenance of the technical conditions that made communication possible. Disruptions such as the misuse incident in which a male member contacted women privately were moments when the network wavered, requiring realignment through new rules, administrative intervention, and reaffirmation of the group's purpose.

Seen through ANT, both the coffin and the WhatsApp group illustrate how translations and mediations enable actors to gain agency, and how that agency remains provisional, always contingent on the maintenance of relationships across heterogeneous terrains.

5. Discussion

The gaps in the existing literature point to the need for an approach that can move fluidly between matters of fact and matters of concern, following actors across disciplinary, ontological, and spatial boundaries without privileging one domain in advance. Actor–Network Theory (ANT) offers such a pathway. By suspending assumptions about fixed categories like "community," "technology," or "elephant," ANT treats these as outcomes of ongoing relations rather than starting points. This reframing shifts the research focus from isolating causes and measuring static variables to tracing how diverse human and non-human actors assemble, stabilise, and transform what we later name as "conflict." In the Puliyankulama case, this meant attending equally to elephants, villagers, a coffin used in protest, mobile network infrastructure, the WhatsApp platform, government letters, and even religious vows to Lord Ganesh, treating each as an active participant in the network rather than as background context.

This approach addresses several weaknesses identified in the review. It dissolves the disciplinary silos that limit the transfer of insights between spheres. It prevents ecological studies from bracketing out symbolic and political dimensions, while also grounding socio-cultural accounts in material and technological realities. It resists the layering tendency of the complex sphere by examining how nature and culture are co-produced, rather than pre-given. In doing so, it also captures phenomena often excluded from traditional analyses, such as the influence of server locations on information flow or the role of objects in mobilising political action.

However, applying ANT also surfaces limitations that conservation conflict scholars must take seriously. First, ANT's strength in producing thick, situated descriptions can frustrate practitioners seeking concise, transferable prescriptions. The value lies not in offering a universally replicable "solution," but in showing how interventions succeed or fail in specific contexts, a perspective that demands patience and sustained engagement. As Latour (1999) suggests, we need to 'slow down.' Second, the methodological demands are high, following actors across legal, ecological, technological, and spiritual domains requires deep ethnographic immersion and cross-disciplinary fluency, which may not be feasible in rapid-response contexts. Third, ANT's ontological agnosticism, its refusal to assign inherent priority or blame, can be seen as ethically ambiguous, particularly in situations where systemic injustice is evident. This is a common criticism against ANT (Sismondo, 2007). Yet, by grounding critique in concrete empirical relations rather than abstract moral claims, ANT can in fact strengthen the evidential basis for political or ethical intervention (Latour, 2004).

For conservation conflict research, the Puliyankulama case illustrates how ANT can bridge the epistemic gap between spheres while preserving complexity. It makes visible the distributed and contingent nature of agency, showing that both the successes (real-time alerts, misinformation control) and failures (privacy breaches, trust erosion) of the WhatsApp group are effects of a shifting socio-technical-ecological assemblage. These insights do not replace existing approaches but complement them, offering a meta-level method for tracing the relational infrastructure of conflict and intervention. For

design research, this reframing is equally significant. Moving beyond human-centred design to consider more-than-human networks opens new possibilities for intervention: designing with, rather than simply for, elephants, infrastructures, landscapes, and technologies. This involves not only creating tools but cultivating the conditions under which relationships between actors can stabilise in ways that promote coexistence. Such a practice resists premature simplification, working instead with the inherent instability, negotiation, and hybridity of conservation conflicts (Giaccardi et al., 2025).

In sum, ANT's contribution to HEC research lies in its ability to re-describe the phenomenon in ways that make cross-domain connections visible, without collapsing, confusing, and flattening them into a single explanatory framework. It neither replaces the granular insights of the nature and cultural spheres nor assumes that their integration is straightforward. Instead, it offers a method for navigating between them, tracing how heterogeneous actors produce the conflicts and responses we seek to understand. This, in turn, creates space for more adaptive, context-sensitive strategies; strategies that recognise the inseparability of ecological processes, social dynamics, and technological infrastructures in the pursuit of sustainable coexistence.

However, what we have begun here is essentially a disassembling of actors. The research floor is now far messier than in a traditional study, because every element, human, non-human, material, symbolic, is on the table at once. Yet it is precisely this messiness that allows us to work cautiously, and more importantly, to work collectively, in imagining interventions. ANT reminds us that no entity is inherently durable or weak; stability and fragility are achievements of ongoing alignment. Designing or managing interventions in such contexts means engaging with this instability rather than trying to eliminate it, building approaches that can adapt as the network shifts, rather than assuming it will hold still. While the findings offer transferable conceptual insights into how digital infrastructures, humans, and non-humans co-assemble in human–elephant conflict, they are not intended to produce broad generalizations. Future work could extend this approach through multi-site comparisons or by studying different community alert infrastructures across regions to examine how variations in material, institutional, and ecological conditions shape network formation and breakdown. Moreover, the esoteric nature of ANT vocabulary often makes such descriptions less accessible to a broader audience. Methodologically, the study also carries a limitation from an ANT point of view, as some observations were made in retrospect rather than during the exact moment the events unfolded. However, the artefacts collected provided sufficiently detailed traces, allowing the sequence of actions to be reconstructed with clarity. This positions the case as a strong example for demonstrating the potential of rethinking and inquiring into conflict situations through a different lens.

6. Conclusion

The literature review showed how scholarship on HEC remains split into nature and culture spheres, with even "complex hybrid" approaches often layering them without rethinking their separation. ANT, applied through the Puliyankulama case, offered a way to work otherwise. Rather than beginning with "human," "elephant," or "technology" as pre-given categories, we traced how they were assembled, how a death, a coffin, a protest, a mobile network, a WhatsApp group, a religious vow, and a forest's edge became entangled in a single unfolding. ANT is not a grand theory to solve HEC, but a method for staying with its instability, following controversies, watching alignments form and break, and attending to how actors hold one another in place, however briefly. From this perspective, a coffin is no longer just an object but a mediator that blocks roads, summons officials, draws media, and reshapes local governance. A WhatsApp group is not merely a tool but a site where elephant movements, signal strength, app affordances, gendered norms, and the memory of violence negotiate what counts as safety. Both successes; real-time alerts, misinformation control and failures; privacy breaches, trust erosion are emergent effects of the network as it shifts. This is precisely what existing spheres miss: nature accounts rarely follow symbolic and infrastructural mediators; cultural accounts often leave out the material and ecological constraints; complex accounts tend to combine them without dissolving their ontological split.

The take-home message for conservation and design practice is that coexistence cannot be designed from outside the network. Interventions must be composed from within, with wires, forests, fences, maps, elephants, grieving villagers, and the infrastructures that tie them together (things which we design together (Storni et al., 2015)). In this sense, the work here aligns with Latour's call for a "cautious Prometheus" in design. A "cautious Prometheus" in design is not the heroic figure who imposes innovation from above, but the careful composer who works within existing entanglements, making modest, reversible adjustments in fragile arrangements of humans and non-humans.

To conclude, if we must, and only to begin again with ANT, we should abandon the tidy fiction that HEC is a stable territorial dispute between reason-bearing humans and instinct-driven elephants, fixable with the right dose of technology. What Puliyankulama gave us was not resolution, but magma (Venturini, 2010) and ever shifting floor. ANT has not explained HEC. It has refused to. Instead, it asks: who is holding whom together, and with what consequences? The answer is not a policy brief or a silver bullet, but an ongoing negotiation in which design and intervention itself must learn to work with fragility and to do so cautiously, as Prometheus would if he knew the fire was not his to keep.

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