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**DEFENSIBLE HUMAN LIFE IN THE CONNECTING VILLAGES OF
NAGARAHOLE FOREST: A CASE STUDY OF METIKUPPE**

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Abstract

Human settlements situated along protected forest boundaries experience complex socio-ecological interactions. This expanded study examines defensible human life in the Metikuppe village cluster located near the Nagarahole landscape in Karnataka, India. Using qualitative field observation, secondary datasets, and spatial interpretation, the research analyses patterns of human-wildlife interaction, infrastructural vulnerability, and livelihood insecurity. The findings highlight recurring elephant-driven crop depredation, transportation isolation, and uneven governance response. The paper argues that defensible human life in forest-fringe regions requires integrated conflict-mitigation systems, participatory governance, and landscape-scale planning that balance conservation and human safety.

Keywords: Human-wildlife conflict; defensible human life; forest fringe settlements; elephant depredation; Nagarahole; socio-ecological vulnerability; livelihood insecurity; participatory governance; community resilience; Karnataka

1. INTRODUCTION

Across South Asia, villages located at the interface between protected forests and agricultural landscapes represent some of the most dynamic socio-ecological systems. These regions experience direct human-wildlife encounters while simultaneously serving as zones of conservation governance, livelihood production, and cultural interaction. The intricate interplay between human activities and wildlife presence in these areas often leads to significant human-wildlife conflict, impacting both local communities and conservation efforts (Ashokkumar et al., 2021; Margulies & Karanth, 2018).

The Nagarahole landscape, part of the Nilgiri Biosphere Reserve, contains high densities of elephants, large carnivores, and herbivores. Forest-edge villages such as Metikuppe therefore, represent important case studies for understanding how rural communities negotiate environmental risk and conservation regulation. These interactions, particularly involving megafauna like elephants, frequently lead to multifaceted challenges for local populations, encompassing direct threats to human life and property, alongside broader implications for agrarian livelihoods (Gupta, 2013; Prasad et al., 2025). Such encounters necessitate a comprehensive understanding of human-wildlife dynamics beyond simplistic conflict narratives, often rooted in historical land-use patterns and conservation policies (Margulies & Karanth, 2018).

The ability of communities to maintain safety, livelihood stability, and access to essential services despite ecological risks is a critical area of study, often referred to as community resilience or social-ecological resilience. In forest-fringe contexts, defensibility is influenced by wildlife movement corridors, infrastructure limitations, and governance capacity.

This study specifically investigates the concept of "defensible human life," which refers to the strategies and conditions enabling human communities to safeguard their well-being, economic stability, and cultural practices in environments characterized by the constant presence and movements of wild animals, particularly large mammals (Dundi et al., 2023).

Despite extensive documentation of the direct impacts of human-wildlife conflict, a significant gap remains in understanding the deeper socio-ecological vulnerabilities and intangible costs experienced by rural communities (Galley & Anthony, 2024). Specifically, research often overlooks the chronic anxieties, restrictions on mobility, and erosion of traditional coping mechanisms that arise from living in fragmented borderland ecosystems where human and non-human animals frequently trespass into shared spaces (Singh et al., 2024).

This study expands existing research by integrating spatial interpretation, community perspectives, and policy review to analyse how residents of Metikuppe navigate daily risks and build resilience. This comprehensive approach aims to elucidate the multifaceted dimensions of human-elephant relations, moving beyond a sole focus on conflict to explore the underlying social, cultural, and historical drivers influencing these interactions (Singh et al., 2024).

2. METHODS

The study applies a qualitative case-study methodology complemented by spatial interpretation. Primary data include field observation and informal discussions with residents and forest personnel. Secondary sources include government management plans, academic literature on human-wildlife conflict, and NGO reports related to the Nagarahole landscape. Spatial interpretation was conducted using approximate geographic reference points to illustrate the relative position of Metikuppe in relation to forest boundaries. The analysis follows thematic coding of vulnerability factors and infrastructural constraints. This methodology facilitated a comprehensive understanding of the multifaceted pressures impacting human-wildlife coexistence within this specific ecological and social setting (Margulies & Karanth, 2018).

3. STUDY AREA

Metikuppe village lies along the southern boundary of the Nagarahole landscape within Karnataka (Figure 1). The settlement is surrounded by dense forest patches and elephant movement routes. Residents depend primarily on agriculture, plantation labour, and seasonal forest-based activities. This dependency often leads to direct human-wildlife interactions, frequently resulting in conflict scenarios (Prasad et al., 2025). These encounters, often exacerbated by habitat fragmentation and land-use changes, transform the landscape into a hazardscape where human vulnerability is a defining characteristic across material, socio-economic, and cultural dimensions (Köpke et al., 2024).

Study Area Map: Metikuppe – Nagarahole Landscape (schematic GIS representation)

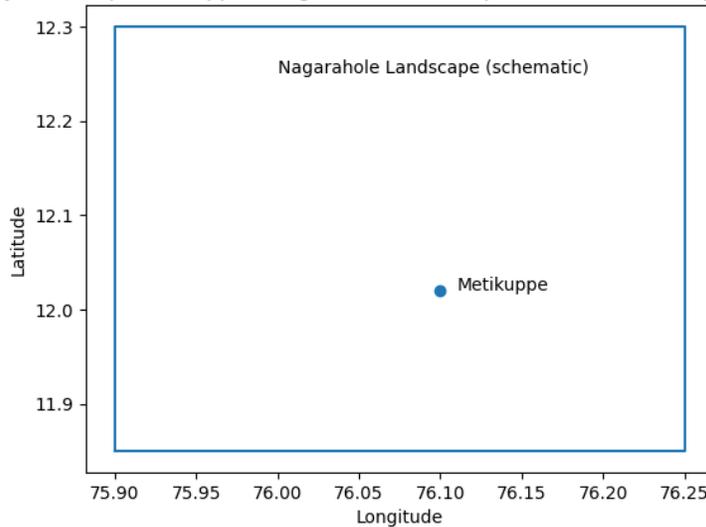


Figure 1: Study area map

4. RESULTS AND DISCUSSION

Field observations and secondary reports indicate that elephant crop depredation represents the most frequent form of human–wildlife conflict. Agricultural fields located near forest edges experience periodic damage during seasonal movement periods. Carnivore presence is reported less frequently but generates significant fear among residents due to livestock losses.

Infrastructure limitations compound these ecological risks. Roads connecting interior hamlets remain partially unpaved, reducing access to healthcare facilities and markets. Mobile communication networks are inconsistent, which limits early warning systems during wildlife movement events. table 1 indicates the infrastructural deficits exacerbate the vulnerability of residents to human-wildlife interactions, further constraining their ability to respond effectively to immediate threats and long-term socio-economic challenges (Karanth & Vanamamalai, 2020).

Table 1. Key Vulnerability Indicators in Metikuppe

Indicator	Observed Condition	Implication
Crop depredation	Frequent elephant raids	Income instability
Road connectivity	Partially unpaved	Delayed emergency access
Healthcare access	Nearest clinic >10 km	Medical vulnerability
Communication network	Weak signal	Limited warning systems

5. DISCUSSION

The findings demonstrate that defensible human life in forest-edge settlements depends on multiple interconnected systems rather than a single mitigation measure. Wildlife barriers such as solar fencing may reduce crop damage but cannot eliminate the broader structural vulnerabilities created by transportation isolation and economic marginalization. Effective governance must therefore combine ecological management with rural development policies. Moreover, the prevalence of damaged or non-functional electric fences across significant portions of the forest perimeter underscores the inadequacy of singular infrastructure-based solutions (Rohini et al., 2017). This perspective aligns with studies highlighting the limited efficacy of mitigation measures, such as electric fences, when implemented in isolation, particularly given the financial constraints often faced by local populations (Köpke et al.,

2024). This emphasizes the need for comprehensive, integrated strategies that address both human needs and wildlife conservation, rather than relying on isolated interventions. This integrated approach is critical for enhancing community resilience and mitigating the diverse impacts of human-wildlife conflict, which often extend beyond immediate material losses to encompass socio-economic and psychological burdens (Köpke et al., 2024). These burdens can manifest as profound livelihood instability, increased workloads, psychological trauma, and reduced food availability, necessitating multifaceted interventions that acknowledge the intricate interplay of these factors (Galley & Anthony, 2024). The emotional toll of living with persistent human-wildlife conflict further exacerbates these challenges, often leading to mental health issues such as fear and anxiety, with some individuals resorting to maladaptive coping mechanisms (Galley & Anthony, 2024). Furthermore, the disproportionate impact of HWC on financially disadvantaged households, who often lack the resources for effective deterrents like electric fences, underscores existing socio-economic disparities within these vulnerable communities (Galley & Anthony, 2024). Community knowledge plays a crucial role in conflict mitigation. Residents possess detailed understanding of seasonal wildlife movement and adapt agricultural strategies accordingly. However, these coping mechanisms remain insufficient without institutional support. Improved early warning systems, community-managed watchtowers, and rapid response teams could significantly reduce risk level

6. CONCLUSION

Metikuppe village exemplifies the complexities of life on the forest edge. While residents possess strong ecological knowledge, their ability to sustain safe and dignified living conditions is challenged by wildlife conflict, limited infrastructure, inadequate emergency support, and socio-economic vulnerability. Current interventions—such as fencing, compensation schemes, and eco-development committees—offer partial solutions but fail to address deep-rooted structural issues.

For human life to be truly defensible in such landscapes, conservation planning must integrate community safety systems, livelihood security, and participatory governance. Strengthening physical infrastructure, establishing reliable communication networks, and empowering tribal communities through education and inclusive policy design remain essential for long-term resilience.

7. STATEMENTS & DECLARATIONS:

Use of AI Statement

The authors declare that they have not used generative artificial intelligence, specifically ChatGPT in the writing of this manuscript and/or in the creation of images, graphics, tables, or their corresponding captions

Conflict of Interest and Declarations:

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8. REFERENCES

1. Ashokkumar, M., Chinnaiyan, S., Kaliyaperumal, S., Shanmugavelu, S., & Desai, A. A. (2021). Determinants of Human-Elephant Conflict in Mudumalai Tiger Reserve, Southern India. *Research Square (Research Square)*. <https://doi.org/10.21203/rs.3.rs-640008/v1>
2. Dickman, A. (2010). Complexities of conflict: the importance of considering social factors for effectively resolving human-wildlife conflict. *Animal Conservation*, 13(5), 458. <https://doi.org/10.1111/j.1469-1795.2010.00368.x>

3. Dundi, D. B., Praet, I., & Marvin, G. (2023). Good, quarrelsome, bad: animal agency and human-elephant interactions in the Western Ghats, India. *Frontiers in Conservation Science*, 4. <https://doi.org/10.3389/fcosc.2023.1142333>
4. Galley, W., & Anthony, B. P. (2024). Beyond Crop-Raiding: Unravelling the Broader Impacts of Human-Wildlife Conflict on Rural Communities. *Environmental Management*, 74(3), 590. <https://doi.org/10.1007/s00267-024-02018-9>
5. Gupta, A. (2013). Elephants, safety nets and agrarian culture: understanding human-wildlife conflict and rural livelihoods around Chobe National Park, Botswana. *Journal of Political Ecology*, 20(1). <https://doi.org/10.2458/v20i1.21766>
6. Karanth, K. K., & Vanamamalai, A. (2020). Wild Seve: A Novel Conservation Intervention to Monitor and Address Human-Wildlife Conflict. *Frontiers in Ecology and Evolution*, 8. <https://doi.org/10.3389/fevo.2020.00198>
7. Kei, L. H., Bakri, N. A. A. B., Lin, P., Khairunizan, H. K. B., Yuan, K., & Abdullah, N. H. (2024). Mitigating Human-Elephant Conflict: a Comprehensive Review of Strategies for Sustainable Coexistence in Support of SDG 15 [Review of *Mitigating Human-Elephant Conflict: a Comprehensive Review of Strategies for Sustainable Coexistence in Support of SDG 15*]. *Journal of Lifestyle and SDGs Review*, 5(2). <https://doi.org/10.47172/2965-730x.sdgsreview.v5.n02.pe02756>
8. Köpke, S., Withanachchi, S. S., Perera, E. N. C., Withanachchi, C. R., Gamage, D. U., Nissanka, T. S., Warapitiya, C. C., Nissanka, B. M., Ranasinghe, N. N., Senarathna, C. D., Dissanayake, H. R., Pathirana, R., Schleyer, C., & Thiel, A. (2024). Factors driving human–elephant conflict: statistical assessment of vulnerability and implications for wildlife conflict management in Sri Lanka. *Biodiversity and Conservation*, 33(11), 3075. <https://doi.org/10.1007/s10531-024-02903-z>
9. Margulies, J. D., & Karanth, K. K. (2018). The production of human-wildlife conflict: A political animal geography of encounter. *Geoforum*, 95, 153. <https://doi.org/10.1016/j.geoforum.2018.06.011>
10. MoEFCC. (2018). *Human–Wildlife Conflict Mitigation Guidelines*.
11. Prasad, S. V., Aditya, V., Solomon, J., & Karanth, K. K. (2025). Community mitigation decisions in elephant conflict zones of southern India depend on environmental and socio-economic drivers. *Scientific Reports*, 15(1), 34693. <https://doi.org/10.1038/s41598-025-14867-3>
12. Rohini, C. K., Aravindan, T., Das, K. S. A., & Vinayan, P. A. (2017). Status of conflict mitigation measures in Nilambur, Western Ghats of Kerala, India. *Journal of Threatened Taxa*, 9(12), 11025. <https://doi.org/10.11609/jott.3465.9.12.11025-11032>
13. Singh, R., Negi, R., Gonji, A. I., Sharma, N., & Sharma, R. K. (2024). Past shadows and gender roles: Human elephant relations and conservation in Southern India. *Journal of Political Ecology*, 31(1). <https://doi.org/10.2458/jpe.2834>
14. Treves, A., & Karanth, K. U. (2003). Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide. *Conservation Biology*, 17(6), 1491. <https://doi.org/10.1111/j.1523-1739.2003.00059.x>