

Farmers' Knowledge, Perception and Coping Strategies towards Human–Wildlife Conflict in Forest-Fringe

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ABSTRACT

Human–wildlife conflict (HWC) is a major ecological, economic and social challenge for communities living near forests and protected areas. Forest-fringe farmers are particularly vulnerable because their livelihoods depend on agriculture, livestock and natural resources, while wildlife frequently enters agricultural landscapes in search of food, water and shelter. Crop damage, livestock depredation, property damage and threats to human safety can cause considerable economic losses and influence farmers' knowledge, perceptions, attitudes and willingness to coexist with wildlife. Farmers also develop different coping strategies based on local experience, available resources and the wildlife species involved. Common measures include field guarding, fencing, trenches, lights, noise, changes in cropping patterns, early harvesting, collective protection. This review examines farmers' knowledge, perceptions, attitudes and coping strategies towards HWC in different regions of India, including Tamil Nadu, Assam, Kerala, West Bengal, Uttarakhand, Himachal Pradesh and Karnataka. The reviewed studies indicate that the intensity and nature of HWC vary according to local ecological, socioeconomic and agricultural conditions. Effective conflict management requires improved awareness, community participation, preventive measures and stronger coordination between farmers and forest authorities.

INTRODUCTION:

Human–wildlife conflict is an important environmental and socioeconomic issue in India. Expansion of agriculture, habitat fragmentation and increasing human populations have brought people and wildlife into closer contact. Forest-fringe villages are particularly vulnerable because agricultural fields, settlements and livestock-rearing areas are often located close to wildlife habitats.

Wildlife may enter agricultural fields and cause crop damage, livestock losses and property damage, affecting household income and food security. Repeated crop damage may create financial stress and reduce farmers' tolerance towards wildlife. Farmers therefore develop different coping strategies depending on local wildlife species, agricultural practices and socioeconomic conditions.

Farmers living close to forests generally possess considerable practical knowledge about wildlife because of repeated encounters. They may understand seasonal wildlife movements, preferred crops, animal behaviour, timing of crop raids and locations where wildlife commonly enters fields. Such local knowledge can contribute to developing suitable conflict-management strategies

1. Objectives of the Review

The objectives of this review are:

1. To review farmers' knowledge regarding human–wildlife conflict in forest-fringe areas.
2. To examine farmers' perceptions and attitudes towards wildlife and conservation.
3. To identify major coping and mitigation strategies adopted by farmers.
4. To compare findings from selected studies conducted in different regions of India.

5. To identify research gaps and suggest approaches for improving HWC management.

2. Farmers' Knowledge of Human–Wildlife Conflict

Farmers' knowledge is strongly influenced by their direct experience with wildlife. Repeated crop damage or livestock depredation helps farmers identify wildlife species, movement patterns and periods of increased conflict. Farmers may also recognize crop preferences and locations frequently used by animals.

This local knowledge is valuable for identifying conflict-prone areas and planning preventive measures. However, knowledge levels vary according to education, farming experience, frequency of wildlife encounters and access to information from forest authorities.

3. Farmers' Perceptions towards Wildlife Conflict

Farmers' perceptions of wildlife are strongly influenced by their direct experiences. Repeated crop damage or livestock depredation may create negative perceptions of the species responsible, particularly where economic losses are high. In contrast, communities experiencing fewer losses or having stronger cultural and ecological connections with wildlife may show greater tolerance.

Veeraswami *et al.* (2016), in Tamil Nadu, examined farmers' tolerance towards HWC involving elephants, wild pigs, gaur and monkeys. The study reported a substantial proportion of farmers with medium levels of tolerance, indicating that attitudes cannot simply be classified as positive or negative. Tolerance may vary according to the frequency and severity of conflict.

Research from North Bengal examined attitudes towards elephants and forest authorities. The findings suggested that people could retain positive attitudes towards elephants despite conflict, while their perceptions of forest officials could differ. This highlights the importance of distinguishing attitudes towards wildlife from attitudes towards institutions responsible for conflict management.

Farmers' perceptions are influenced by economic losses, cultural values, previous experiences, knowledge, perceived risk, trust in government institutions and compensation effectiveness. If authorities respond quickly and fairly, farmers may be more willing to tolerate wildlife. Delayed compensation and poor communication can increase dissatisfaction.

Understanding these perceptions is therefore essential for conservation planning. Technical mitigation measures alone may have limited success if farmers' concerns and attitudes are not considered.

4. Coping Strategies Adopted by Farmers

Farmers use individual, physical, agricultural, deterrent and community-based strategies to protect crops and livelihoods.

4.1 Field Guarding

Night guarding is one of the most common strategies in forest-fringe areas. Farmers or family members stay near fields to detect wildlife and drive animals away using lights, shouting or other deterrents. Although guarding can reduce crop damage, it requires considerable labour and may cause physical and psychological stress.

4.2 Physical Barriers

Fencing, trenches and other barriers are used to restrict wildlife movement into fields. Their effectiveness depends on species, terrain,

construction quality and maintenance. Properly designed barriers can reduce crop damage, but expensive or poorly maintained structures may not provide long-term protection. Locally suitable and cost-effective designs are therefore important.

4.3 Changes in Agricultural Practices

Farmers may change crop selection, cultivation periods and harvesting schedules to reduce conflict. Planting less preferred crops near forest boundaries and modifying cropping patterns may help reduce crop losses.

4.4 Scaring and Deterrence

Shouting, lights, noise and other non-lethal methods are commonly used to drive wildlife away. These methods are inexpensive and easily implemented, but their effectiveness may decline when animals become accustomed to repeated deterrents.

A recent study around Bannerghatta National Park in Karnataka found guarding and shouting among commonly used mitigation practices, while farmers also considered physical barriers as a possible means of reducing crop damage. This indicates the importance of identifying strategies that are both effective and acceptable to local communities.

4.5 Community-Based Strategies

Community participation can improve conflict mitigation. Farmers may coordinate night guarding, share information about wildlife movement and respond together when animals enter fields. Community-based monitoring and local groups can strengthen cooperation and improve protection.

5. Comparative Review of Selected Studies

Studies from different parts of India show considerable variation in HWC and farmers' responses.

Pandey *et al.* (2022), in Assam, examined human–elephant conflict and its effects on communities around Kaziranga National Park. Crop damage was identified as an important concern, demonstrating the direct effects of elephant movement on agricultural livelihoods.

Research in Wayanad, Kerala, examined human–elephant interactions, perceptions and mitigation strategies. Farmers adopted agricultural and protective measures, including changes in farming practices and early harvesting.

Veeraswami *et al.* (2016) studied farmers' tolerance towards HWC in Tamil Nadu involving elephants, wild pigs, gaur and monkeys. Medium levels of tolerance were reported, showing that attitudes are influenced by multiple factors rather than being uniformly positive or negative.

The North Bengal study examined attitudes towards elephants and forest authorities and indicated that attitudes towards wildlife and government institutions may differ. This emphasizes the importance of institutional trust in HWC management.

Rawat *et al.* (2024), in Uttarakhand, examined villagers' perceptions and agricultural consequences of HWC. Conflict was perceived as an important agricultural problem, demonstrating the need to consider both social perceptions and economic impacts.

The Bannerghatta National Park study in Karnataka examined farmers' perceptions and mitigation practices. Guarding and shouting were commonly used, while physical barriers were also considered useful.

Pebsworth *et al.* (2025), in Himachal Pradesh, examined adoption of mitigation strategies and demonstrated that local conditions influence the choice of approaches.

Overall, the studies show that HWC differs among regions. Elephants are particularly important in several forest-fringe landscapes, while wild pigs, monkeys, leopards, gaur and other species are important elsewhere. Therefore, a single mitigation strategy cannot be applied successfully across all locations.

6. Comparison with the Proposed Study

Previous studies have mainly focused on specific wildlife species, crop damage, farmers' perceptions or individual mitigation practices. However, fewer studies have combined farmers' knowledge, perception and coping strategies while considering ecological and socioeconomic factors together.

The proposed study can provide a more comprehensive understanding of how farmers respond to HWC by examining their knowledge of wildlife behaviour, extent of crop damage, conflict experience, coping practices and perceptions towards conservation. Such information can help identify locally appropriate mitigation measures.

7. Research Gap

Although many studies have examined HWC in India, substantial differences exist between regions and communities. Several studies focus on specific wildlife species or particular forms of conflict, especially elephant crop raiding and livestock depredation. There is a need for more integrated village-level research.

Few studies simultaneously examine knowledge, perception, attitudes, economic impact, compensation awareness and coping strategies. Farmers' experiences can also differ between villages within the same forest landscape because of differences in crops, distance from forests, wildlife movement, socioeconomic conditions and access to government support.

Another important gap concerns the effectiveness and sustainability of coping strategies. Farmers may adopt methods because they are inexpensive or easily available even when their effectiveness is limited. Future research should therefore evaluate not only which strategies are used but also their effectiveness, cost, labour requirements, safety and long-term sustainability.

A study of forest-fringe villages in the Sirsi region can provide locally relevant information and contribute to practical, community-oriented HWC management in the Western Ghats landscape.

8. Recommendations

Based on the reviewed studies, the following measures can help reduce HWC:

- Improve farmers' awareness of wildlife behaviour, conflict-prone periods and suitable preventive measures.
- Provide timely, transparent and accessible compensation for crop and livestock losses.
- Promote cost-effective physical barriers suitable for local wildlife species and terrain.
- Strengthen communication and cooperation between forest officials and communities.
- Encourage community-based monitoring, collective guarding and information sharing.
- Provide training on safe and appropriate non-lethal mitigation techniques.
- Consider local cropping patterns and wildlife preferences while developing HWC programmes.
- Maintain systematic records of crop losses and wildlife incidents for evidence-based management.

CONCLUSION

Human–wildlife conflict is a complex ecological, economic and social issue. Studies from Tamil Nadu, Assam, Kerala, West Bengal, Uttarakhand, Himachal Pradesh and Karnataka demonstrate that farmers' knowledge, perceptions, attitudes and coping strategies vary according to wildlife species, geographical conditions, agricultural practices, socioeconomic circumstances and institutional support.

Farmers living near forests possess valuable practical knowledge of wildlife movement and crop-raiding behaviour, but their awareness of formal compensation systems and mitigation programmes may be limited. Repeated economic losses can reduce tolerance even when farmers recognize the ecological importance of wildlife. Farmers nevertheless develop several coping strategies, including field guarding, fencing, shouting, lights, agricultural modification, early harvesting and collective protection.

The evidence shows that HWC cannot be managed through one universal solution. Strategies must be adapted to local wildlife, agricultural systems and socioeconomic conditions. Technical measures should be combined with awareness programmes, effective compensation, community participation and improved coordination between farmers and forest authorities.

The proposed study on farmers' knowledge, perception and coping strategies can provide valuable local-level evidence on the social and agricultural dimensions of HWC in the Sirsi region. Identifying the major wildlife species involved, extent of crop damage, farmers' perceptions, economic impacts and coping

strategies can contribute to practical and socially acceptable approaches to conflict management. Treating farmers as important stakeholders rather than merely victims of conflict can strengthen conservation efforts and support long-term coexistence between forest-fringe communities and wildlife.

REFERENCES

Bannerghatta National Park Study (2025). Study of farmers' perceptions and effectiveness of human-wildlife conflict mitigation measures in Karnataka.

Frontiers in Conservation Science (2023). Study of human-elephant interactions, perceptions and mitigation strategies in Wayanad, Western Ghats, India.

North Bengal Study (2024). Study of attitudes towards elephants and forest authorities in North Bengal, India.

Pandey, et al. (2026). Study of human-elephant conflict and coexistence strategies in India.

Pandey, P *et al.* (2022). Study on human-elephant conflict and its impact on communities around Kaziranga National Park, Assam.

Rawat, *et al.* (2024). Study of villagers' perception and agricultural consequences of human-wildlife conflict in Uttarakhand.

Veeraswami, G., *et al.* (2016). Farmers' tolerance towards human-wildlife conflict in selected areas of Tamil Nadu, India.