



Between Fields and Forests: Human–Wildlife Conflict in the Gudalur–Pandalur Landscape of the Nilgiris

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The Nilgiris district of Tamil Nadu is renowned for its rich biodiversity, picturesque landscapes, tea plantations, and agricultural production. However, the district is also one of India's most significant hotspots for human–wildlife conflict. The Gudalur–Pandalur landscape, situated at the tri-junction of Tamil Nadu, Kerala, and Karnataka, experiences frequent interactions between humans and wildlife, particularly elephants. These interactions often result in crop losses, property damage, livestock depredation, and human casualties. Human–wildlife conflict has emerged as a major challenge to sustainable agriculture in the region. Farmers living near forest boundaries face increasing economic losses, while wildlife populations are threatened by habitat fragmentation and retaliatory actions. Achieving a balance between agricultural development and wildlife conservation has therefore become a critical priority.

The Gudalur–Pandalur Landscape: A Conflict Hotspot

Gudalur and Pandalur are strategically located between the Nilgiri forests, Mudumalai Tiger Reserve, Wayanad Wildlife Sanctuary, and Bandipur National Park. This region forms an important elephant corridor facilitating seasonal movement of elephants across the Western Ghats. Over the past several decades, expansion of tea plantations, coffee estates, settlements, roads, and agricultural lands has fragmented traditional elephant migration routes. Consequently, elephants increasingly move through cultivated fields and human settlements while searching for food and water. The region's agriculture is highly diverse and includes: Paddy, Banana, Coconut, Arecanut, Coffee, Pepper, Ginger, Cardamom, Tapioca and Vegetables. Many of these crops are highly attractive to elephants and other wild animals because of their high nutrient and moisture content.

Major Wildlife Species Causing Agricultural Damage

Asian Elephant (*Elephas maximus*): The elephant is the most important conflict-causing species in the Nilgiris. Crop raiding by elephants occurs throughout the year but is particularly severe during crop maturity stages. A single elephant herd can destroy an entire field within a few hours, causing substantial financial losses.

Wild Boar (*Sus scrofa*): Wild boars frequently damage paddy, maize, vegetables, and tuber crops. Their digging behaviour destroys seedlings and irrigation channels.

Bonnet Macaque: Monkey populations around settlements and plantations have increased significantly. They cause damage to fruits, vegetables, maize, and coconut.

Gaur (Indian Bison): Gaurs increasingly enter agricultural lands and tea estates bordering forests. Paddy and fodder crops are particularly vulnerable.

Deer, Porcupines and Peafowl: These species collectively contribute to significant crop losses, particularly during seedling and grain development stages.

Human Casualties in the Gudalur–Pandalur Region

Human deaths caused by elephant attacks represent one of the most serious consequences of conflict. Gudalur Range alone accounted for the highest proportion of human fatalities within the division.

Studies conducted in the Gudalur Forest Division reported:

Period	Human Deaths
1993–2006	34
2008–2016 (O'Valley Range)	11
2018–2022	31

Crop Damage Statistics

Crop depredation remains the largest economic burden on farmers.



Fig No .1 Nilgiris Elephant Corridor landscape

Recorded Crop Damage Incidents

Forest Range	Number of Incidents
Gudalur	1065
Bitherkad	825
Cherambadi	251
Pandalur	102

The highest crop damage was reported from Gudalur due to its proximity to major elephant corridors.

Major Crops Affected

Crop	Severity
Banana	Very High
Paddy	Very High
Tapioca	High
Jackfruit	High
Coconut	High
Coffee	Moderate
Pepper	Moderate
Ginger	Moderate
Cardamom	Moderate

Economic Impact on Farmers

The consequences of wildlife conflict extend far beyond crop loss.

1. Direct Economic Losses

- Destruction of standing crops
- Loss of agricultural income
- Damage to irrigation systems
- Damage to fencing and farm infrastructure

2. Additional Expenditure

Farmers incur significant costs for:

- Night guarding
- Solar fencing
- Firecrackers and deterrents
- Labour for crop protection

3. Psychological Stress

Continuous fear of crop loss and elephant encounters affects the mental well-being of farming families. Many farmers spend nights guarding fields, resulting in sleep deprivation and health problems.

4. Government Compensation and Support

Recognizing the increasing severity of human-wildlife conflict, the Tamil Nadu Government has introduced several compensation measures.

5. Compensation for Human Deaths

Compensation for loss of human life due to wildlife attacks has been enhanced to ₹10 lakh.

6. Crop Damage Compensation

Assessment is conducted by Forest Department officials and compensation is provided based on the extent of damage.

7. Assistance for Mitigation Structures

Government-supported programmes provide assistance for:

- Solar-powered fencing
- Elephant-proof trenches
- Bio-fencing
- Habitat improvement measures
- Early warning systems

These interventions are supported under Project Elephant and Integrated Development of Wildlife Habitats schemes.

Current Mitigation Measures

1. Solar Fencing

Solar electric fencing remains one of the most widely adopted methods for reducing elephant entry into agricultural lands.

2. Elephant-Proof Trenches

Trenches constructed along forest boundaries help reduce elephant movement into villages and farms.

3. AI-Based Monitoring

Recent technological interventions include Artificial Intelligence-based monitoring systems that provide real-time information on elephant movement.

4. SMS Alert Systems

Farmers receive warnings regarding elephant presence through mobile-based alert systems.

5. Kumki Elephant Operations

Trained kumki elephants are used to drive problematic wild elephants away from human settlements.

What More Can the Government Do?

Despite several initiatives, additional efforts are necessary.

1. Faster Compensation

Compensation claims should be processed within 15–30 days to reduce financial hardship.

2. Corridor Restoration

Encroached elephant corridors should be restored to facilitate safe wildlife movement.

3. Promotion of Buffer Crops

Farmers near forests should be encouraged to cultivate less attractive crops such as:

- Lemongrass
- Citronella
- Chilli
- Turmeric

4. Community-Based Conflict Management

Village-level wildlife response committees can improve local preparedness and reduce risk.

5. Insurance Schemes

Special crop insurance products covering wildlife damage should be introduced.

6. Scientific Monitoring

Long-term monitoring of elephant movement and conflict hotspots is essential for evidence-based management.

Future Outlook

The Gudalur–Pandalur landscape is both an agricultural production zone and an internationally significant wildlife conservation area. Complete elimination of human–wildlife conflict may not be possible. However, science-based management, community participation, rapid compensation mechanisms, and technological innovations can substantially reduce conflict. The future of sustainable agriculture in the Nilgiris depends upon achieving coexistence between farming communities and wildlife.

Conclusion

Human–wildlife conflict in the Gudalur–Pandalur region represents one of the most pressing challenges facing agriculture in the Nilgiris. Increasing crop damage, human casualties, and economic losses threaten farmer livelihoods, while habitat fragmentation threatens wildlife conservation. Integrated approaches involving farmers, forest departments, researchers, and policymakers are necessary to ensure both agricultural sustainability and biodiversity conservation. Through improved compensation, corridor restoration, technological innovations, and community participation, a future of coexistence can be achieved in this unique landscape.

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