



HUMAN–WILDLIFE CONFLICT AND AGRARIAN LIVELIHOODS IN KERALA: EVIDENCE FROM CHALIYAR GRAMA PANCHAYAT, MALAPPURAM DISTRICT

Rajesh.E, Abdul Rahim K S

ABSTRACT

Human–wildlife conflict has emerged as a major socio-economic and environmental challenge in agrarian regions located near forest ecosystems. In Kerala, increasing interactions between wildlife and farming communities have intensified due to habitat fragmentation, deforestation, agricultural expansion, and changing land-use patterns. This study examines the impact of wildlife conflict on agriculture and rural livelihoods in Chaliyar Grama Panchayat of Malappuram district, Kerala. Using a descriptive research design, primary data were collected from 40 farmers through structured questionnaires and interviews during 2025–2026. The study analyzes socio-economic conditions, crop damage, income loss, compensation mechanisms, and the effectiveness of government policies. The findings reveal that elephants and wild boars are the major wildlife species causing crop damage, resulting in significant annual income losses and food insecurity among farming households. Most respondents considered compensation mechanisms inadequate and delayed, while existing policies were perceived as only slightly effective. Despite repeated losses, the majority of farmers continue agriculture due to lack of alternative livelihood opportunities. The study emphasizes the need for timely compensation, improved preventive measures, crop insurance schemes, and sustainable community-based management strategies to reduce conflict and strengthen rural livelihoods.

KEYWORDS: *Human–wildlife conflict, agriculture, crop damage, compensation, Kerala, rural livelihoods, elephants, wild boar.*

INTRODUCTION

Human–wildlife conflict refers to interactions between humans and wild animals that result in negative consequences for both people and wildlife. These conflicts often include crop destruction, livestock predation, property damage, and threats to human safety. Across the world, rapid population growth, deforestation, agricultural expansion, and climate change have intensified competition between humans and wildlife for land and natural resources.

In India, human–wildlife conflict has become increasingly severe, particularly in regions located near forests and protected areas. Wildlife species such as elephants, wild boars, monkeys, deer, leopards, and bears frequently enter agricultural fields in search of food and water. Farmers living in forest fringe areas experience repeated crop losses and economic instability, which negatively affect their livelihoods, food security, and psychological well-being.

Kerala, situated along the biodiversity-rich Western Ghats, has witnessed a sharp rise in wildlife-related agricultural damage in recent years. Habitat fragmentation caused by plantation expansion, road construction, deforestation, and developmental activities has reduced the natural habitat available for wildlife. Consequently, animals increasingly move into agricultural areas, causing severe crop damage and intensifying tensions between local communities and conservation authorities.

The present study focuses on Chaliyar Grama Panchayat in Malappuram district, Kerala, where farmers regularly experience wildlife attacks on agricultural land. The study aims to understand the socio-economic impact of wildlife conflict on farming households, assess the effectiveness of government compensation mechanisms, and examine the coping strategies adopted by affected communities.

REVIEW OF LITERATURE

Several studies have examined the growing problem of human–wildlife conflict and its impact on rural livelihoods.

Hill (2002) argued that wildlife conflict is deeply connected to socio-economic inequalities, competing stakeholder interests, and livelihood vulnerabilities. Messmer (2009) highlighted the need for participatory and adaptive management strategies to address increasing human–wildlife interactions.



Studies conducted in Kerala reveal serious economic and social consequences of wildlife conflict. Govind and Jayson (2018) documented significant crop losses caused by elephants, wild pigs, and porcupines in central Kerala. Sumitha and Saharban (2022) found that inadequate compensation and ineffective preventive measures forced many farmers in Wayanad district to reduce agricultural activities.

Fredy and Mathew (2023) observed that frontline communities in Malakkapara experienced severe financial instability and psychological stress due to frequent wildlife attacks. Vishaharban and Hanna (2024) reported heavy crop losses in Wayanad and emphasized the poor maintenance of preventive infrastructure such as electric fencing and trenches.

International studies also demonstrate similar patterns. Mhuriro-Mashapa and Mwakiwa (2018) found that elephant-related crop damage imposed heavy economic burdens on farming households in Zimbabwe. Campos de Carvalho and Araujo (2019) reported that nearly all surveyed farmers in Brazil experienced wildlife-related crop losses.

Recent technological approaches have also been explored. Ranparia et al. (2020) and Rampania et al. (2024) developed machine learning-based acoustic deterrent systems capable of detecting and repelling wildlife without causing harm.

The existing literature clearly indicates that wildlife conflict is not merely an ecological issue but also a serious socio-economic challenge affecting rural livelihoods, agricultural productivity, and food security.

OBJECTIVES OF THE STUDY

The major objectives of the study are:

1. To understand the impact of wildlife conflict on agriculture and rural livelihoods.
2. To examine the role of government compensation schemes and policies in addressing farmers' problems.
3. To analyze changes in farmers' income due to wildlife attacks.

METHODOLOGY

The study adopted a descriptive research design. Both primary and secondary data were used.

Study Area

The study was conducted in Chaliyar Grama Panchayat, located in Nilambur Taluk of Malappuram district, Kerala. The Panchayat lies near the forested foothills of the Western Ghats and is characterized by tropical monsoon climate, fertile soil, and dependence on agriculture.

Sources of Data

Primary Data

Primary data were collected directly from farmers through structured questionnaires, interviews, and observations.

Secondary Data

Secondary data were collected from journals, books, government reports, research articles, and related publications.

Sampling Design

A random sampling method was adopted. A total of 40 respondents were selected from different locations within Chaliyar Grama Panchayat.

Tools for Analysis

The collected data were analyzed using percentage analysis, tables, and diagrams.

RESULTS AND DISCUSSION

Socio-Economic Profile of Respondents

The study reveals that the farming population is predominantly elderly. Around 57.5% of respondents were above 60 years of age, while none were below 30 years. This indicates declining youth participation in agriculture.

Educational attainment among respondents was relatively low. Nearly 62.5% had only primary education, 20% had secondary education, and 17.5% were illiterate. None possessed higher secondary education or above.



Agriculture remains the principal occupation for almost all households. About 97.5% of respondents depended primarily on agriculture, while very few engaged in agricultural labor.

The economic condition of farming households appeared weak. Most respondents earned below ₹20,000 per month, and 92.5% reported owning no agricultural assets such as tractors, pump sets, or sprayers.

Although 80% of respondents had access to institutional credit, a large proportion depended on agricultural loans. More than half of the respondents owed between ₹50,000 and ₹2,00,000, indicating substantial financial dependence on borrowed capital.

Nature of Wildlife Conflict

Wildlife conflict was reported as a serious and recurring problem. Around 70% of respondents experienced wildlife-related damage frequently, while the remaining 30% faced occasional attacks.

Elephants were identified as the primary source of damage by 65% of respondents, followed by wild boars (35%). All respondents reported crop damage as the main form of loss.

The financial impact of wildlife attacks was severe. Nearly 42.5% of respondents reported annual income losses between ₹50,000 and ₹1,00,000, while 32.5% lost more than ₹1,00,000 annually.

Despite repeated losses, 95% of respondents continued farming without major changes. This suggests a strong dependence on agriculture and limited alternative employment opportunities.

Impact on Household Security and Livelihood

The study found that wildlife conflict significantly affected household food security and financial stability. Around 72.5% of respondents reported that their household security was moderately affected, while 15% reported severe impacts.

Farmers adopted different coping strategies to manage economic losses. More than half of the households reduced food consumption, while 30% borrowed money to survive. Some respondents also took up additional work to supplement income.

These findings indicate that wildlife conflict contributes to increased rural vulnerability, indebtedness, and livelihood insecurity.

Compensation Mechanisms and Policy Effectiveness

Government compensation mechanisms were widely perceived as ineffective. Around 65% of respondents stated that they had applied for compensation but had not received it. Only 10% reported receiving compensation.

Most respondents considered compensation inadequate. Approximately 80% believed that the compensation provided did not sufficiently cover the losses incurred.

Delay in payment emerged as the most serious issue. Nearly 95% of respondents identified delayed compensation as the primary obstacle in accessing government support.

Regarding policy effectiveness, 52.5% considered government measures only slightly effective, while 40% regarded them as completely ineffective.

When asked about preferred policy measures, most respondents favored faster compensation systems. Others suggested preventive measures such as fencing and crop insurance schemes.

Major Findings

The study highlights the following major findings:

- Agriculture is the primary livelihood source for almost all households.
- The farming population is dominated by elderly individuals with low educational attainment.
- Elephants and wild boars are the major wildlife species causing crop damage.
- All respondents experienced crop damage, resulting in substantial annual income loss.
- Wildlife conflict has negatively affected household food security and financial stability.
- Farmers mainly cope with losses through borrowing and reducing food consumption.



- Compensation mechanisms are delayed, inadequate, and widely perceived as ineffective.
- Existing government policies have failed to provide satisfactory relief to affected farmers.
- Faster compensation, preventive infrastructure, and crop insurance are the most preferred policy interventions.

CONCLUSION

The study demonstrates that human–wildlife conflict has become a major challenge for farming communities in Chaliyar Grama Panchayat, Kerala. Wildlife attacks, particularly by elephants and wild boars, have caused severe crop losses, reduced farm income, and increased economic insecurity among rural households.

Although agriculture remains the primary occupation for most respondents, frequent wildlife attacks and inadequate institutional support have weakened the sustainability of farming livelihoods. Delays in compensation payments, insufficient relief amounts, and ineffective preventive measures have further intensified farmers' dissatisfaction.

At the same time, the persistence of farmers in continuing agriculture despite repeated losses reflects both their resilience and the absence of alternative livelihood opportunities.

The study therefore emphasizes the urgent need for integrated and sustainable policy interventions. Timely compensation, expansion of crop insurance, maintenance of preventive infrastructure, scientific wildlife management, and community participation are essential for reducing conflict and promoting coexistence between humans and wildlife.

Long-term strategies should also focus on livelihood diversification, ecological conservation, and inclusive rural development to ensure both agricultural sustainability and wildlife protection.

REFERENCES

1. Bhattacharya, M. K., et al. (2013). Forest cover change and rising human–wildlife conflict in northern West Bengal, India. *Indian Journal of Forestry*, 36(4), 421–430.
2. Campos de Carvalho, A. L., & Araujo, A. R. (2019). Wildlife-related crop damage and farmers' perceptions in southeastern Brazil. *Journal of Environmental Management Studies*, 22(3), 145–159.
3. Fredy, A. J., & Mathew, J. (2023). Human–wildlife conflict and financial instability among frontline communities in Malakkapara, Kerala. *Journal of Rural Development and Environmental Studies*, 12(2), 45–58.
4. Goel, S., & Sharma, R. (2021). Economic assessment of wildlife-induced crop damage in coastal Odisha. *Indian Journal of Agricultural Economics*, 76(2), 210–224.
5. Govind, S. K., & Jayson, E. A. (2018). Wildlife-induced crop damage in Thrissur district, Kerala. *Kerala Journal of Forestry and Wildlife*, 14(2), 89–104.
6. Hill, C. M. (2002). Human–wildlife conflict: Identifying the problem and possible solutions. *Oryx*, 36(2), 151–158.
7. Kurian, A. L., et al. (2025). Predation on agricultural lands and the emergence of conservation refugees in Kerala, India. *International Journal of Wildlife Conservation*, 18(1), 1–15.
8. Messmer, T. A. (2009). Human–wildlife conflicts: Emerging challenges and opportunities. *Human–Wildlife Conflicts*, 3(1), 10–17.
9. Mhuriro-Mashapa, C., & Mwakiwa, E. (2018). Economic impacts of elephant-induced crop damage in Southern Zimbabwe. *African Journal of Ecology*, 56(3), 420–432.
10. Rampania, D., et al. (2024). Machine learning-based wildlife deterrent system using Raspberry Pi and species-specific acoustic frequencies. *Journal of Conservation Technology*, 9(4), 78–90.
11. Sumitha, S., & Saharban, V. (2022). Crop and property damage and compensation challenges in Wayanad district, Kerala. *Indian Journal of Rural Development*, 41(2), 150–163.
12. Vishaharban, V., & Hanna, C. P. (2024). Economic losses and crop damage assessment in Panamaram Panchayath, Wayanad. *Kerala Journal of Environmental Studies*, 15(2), 60–74.