Conflict Or Co-Existence: Study On Human-Animal Interactions In Sirumugai's Forest Villages

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Abstract: Human-animal conflict is the negative interactions between man and wild animals that lead to serious consequences critical to life. This research aims to investigate the frequency of conflict and interaction patterns with the local community living in the reserve forest villages of Sirumugai, consequences faced by farm owners and efforts taken by the forest department to mitigate losses and manage conflicts using qualitative methods. For this purpose, tools such as interviews, case studies and focus group discussions were used to collect the required information from the respective stakeholders. A total of 22 respondents were purposively picked to understand the intensity of the prevailing problem. The research suggests effective mitigation strategies that strengthen and improve systems to elevate protection of humans and promote conservation of environment.

Keywords - Human-animal conflict, negative interactions, mitigation, conservation.

I. INTRODUCTION

Humans and animals have co-existed in this environment for a very long time. Co-dependency is an important component in maintaining harmony and balance in the ecology and community. With urbanisation and industrialisation, the world has stepped into an era of rapid development across all sectors (Schell et al., 2021), that demand for high energy and resource consumption has caused the threat of depletion of natural resources and the ultimate destruction paving the way for negative human-animal interactions. Goal A and Target 3 of the Kunming-Montreal Global Biodiversity Framework 2050 in correspondence with the achievement of Sustainable Development Goals 2030 explains the vision of reducing the extinction rate and conservation of species along with effectively managing human-wildlife interactions to curb human-wildlife conflict to promote sustainable development (The World Bank, 2023).

Earlier conflict existed under the pretence of survival (Allen et al., 2023) which remained the major reason for the imbalance of restoring peace between animals and humans. The cultural and traditional practices which involved hunting (Ramakrishnan. B et al., 2016) of animals for sport and hanging displays as evidence of power status, forced use in religious and cultural practices and exploitation for labour have shaped human-animal conflict into one of the serious conservation issues today (Narayan & Rana, 2023)

This study aims to study the attributes and attitudes of the local community, the damages and losses faced by the farmers and the mitigation measures and strategies used by the forest department to control conflict, to develop effective suggestions that promote the protection of life and conservation of biodiversity.

II. OBJECTIVES

- To investigate the ecology of species and understand their patterns of interactions and damages caused to the local community in the villages.
- To understand the economic, social and ecological impacts and losses of farm owners and their coping strategies.

- To assess the effectiveness of the implementation of strategies and mitigation measures taken by the forest department to manage conflict and minimize losses.

III. RESEARCH METHODOLOGY

Study Area

The study was conducted in the villages Kanthaiyur (11.357, 77.002) and Lingapuram (11.352, 77.001) which fall within the reserve forest areas of the Sirumugai Forest Range of the Coimbatore Forest Division. These villages are 1.5 km apart and were purposively selected due to the high frequency of conflict compared to the population size (Senthilkumar et al., 2016).
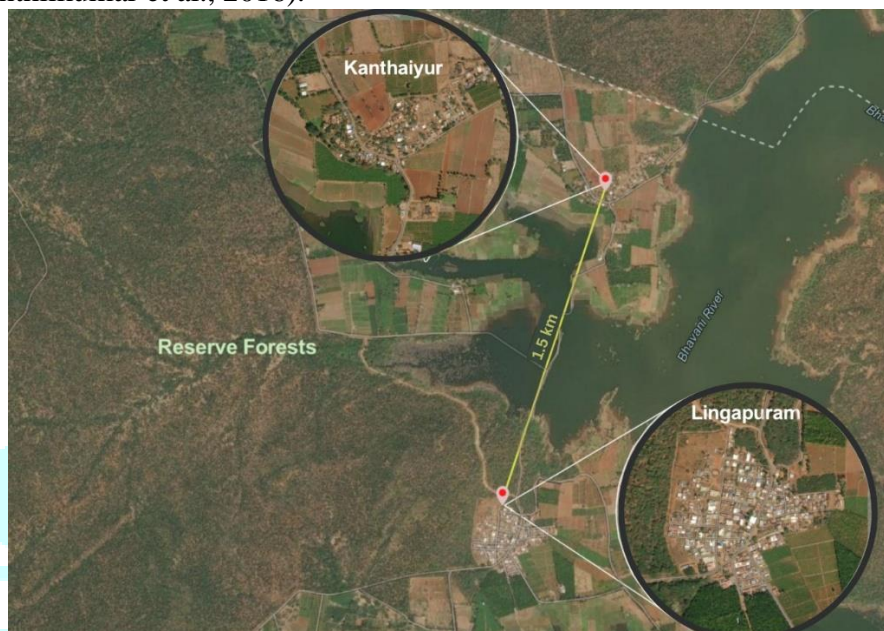

FIGURE 1: Aerial view of the Sirumugai Forest Range and study villages; Kanthaiyur and Lingapuram. Source- ArcGIS Online

Data Collection

The study uses qualitative methods to collect data from 22 respondents. Primary data was collected using tools like observation to obtain a general overview of the villages. A semi-structured interview was used to gather information from the forest department through a series of open-ended questions (Yng & Hasan, 2022). Other methods include focus group discussions and case studies which were used for an in-depth study of the problem among the local people and farm owners. Secondary data was used for the purpose of understanding further concepts.

S. No	Details of Samples	Number of Samples
1.	Local Community	11
2.	Farmers	7
3.	Forest Officials	4
4.	**Total**	**22**

Table 1: Details of Samples Selected from the Sirumugai Forest Range

Pre-test

The pre-test was conducted during the development stages of the research objectives. This pre-test was conducted with a forest guard who has 1.5 years of experience. This also included testing the validity and reliability of the questionnaire to ensure collection of accurate data.

Data Analysis

The interview was conducted in two parts with the forest watcher, guard and the forest ranger with a set of questions that matched their profile. A set of semi-structured questions were posted to each of the respondents and their responses were recorded to make further analysis. The interview consisted a set of 21 questions that aimed to study the ecology of species, the causes of conflict and its intensity, the role of the forest department, the challenges faced and strategies employed to mitigate conflict from the forest watcher, guard and ranger (Dahal et al., 2022).

A focus group discussion was conducted with a group of 11 people from the local community at the Kanthaiyur common temple grounds on 19th January 2024 at 11:00 am IST. The group consisted of 7 males and 4 females and the discussion was conducted for 10 minutes and 48 seconds.

The case studies were collected from 7 farmers, one female and 6 males, who own farm lands in the villages of Kanthaiyur and Lingapuram, to understand their agricultural history, impacts on livelihood and economic losses.

IV. RESULT AND DISCUSSION

Intensity and causes of conflict

Based on data obtained from the forest guard, the conflict recorded in the villages amounted to around 8 elephant mortality, 3 injuries from solar fencing accidents, 7 severe human injuries and 4 human mortalities over the past decade. Located immediately below the foothills of the Nilgiris reserve forest, the two villages- Kanthaiyur and Lingapuram face high-intensity conflict frequently (Sekar, 2013).

The frequency of conflict in the villages is slightly high for a population of about 1400. People of the village practice agriculture as their primary occupation, and the location and proximity to the foothills of the Nilgiris and the Bhavani River, make it ideal for attracting animals out of the forest causing serious trouble in the residential areas and farmlands.

All 7 respondents face extreme loss due to uncertain weather conditions such as monsoon rain, storms and flooding. Intense crop raiding only affects 4 out of 7 farmers. The other 3 farmers face conflict only due to the location of farmland near the river bank, hence encountering animals when they appear to access water, which is almost to none when the river is dried up due to summer. 8 out of 11 villagers feel the conflict has serious effects on their livelihood while the older residents have grown accustomed to the conditions (Mathivanan, 2019).

Awareness and Tolerance Levels

The group discussion revealed that residents of the village have lived there for generations have seen the progress of conflict over the years and have devised their own strategies and methods to deal with the conflict over the years. They also possess immense knowledge about animal behaviour patterns and hot spot locations of the villages. All 22 respondents exhibited high awareness levels about the seriousness and the consequences of the conflict. According to the forest ranger, animals migrate along forest corridors, which makes it difficult for them to record their number or make assumptions about their appearance, requiring them to be vigilant and alert at all times to interfere during conflict.

There seemed to be variations in tolerance towards each animal as exhibited by the population. Based on the data collected, only 3 out of 7 farmers had high tolerance towards the conflict and they have already installed protective mechanisms that mitigate damage to a certain extent. 3 farmers expressed moderate tolerance. These farmers lose their vegetation due to flooding and extreme weather conditions, combined with crop raiding only pushing their business into loss. Frightened animals that run wild into croplands in their way destroy vegetation and plantations. Losing his produce to such situations of stampede, 1 farmer expressed extremely low tolerance (Iqram Arshath S et al., 2020).

Farmers have employed their strategies such as building fences and employing watchers, but they still suffer damages nonetheless.

Attitudes and perceptions of people towards conflict

People exhibited a positive attitude towards the conservation and protection of wildlife and surrounding forests which makes it easier for the forest department to collaborate with the local community (Thomas, 2019) . Some animals are even worshipped as representations of deities like elephants and peacocks. The response to carnivore species such as leopards and crocodiles, the associated fear influenced negative attitudes, as it poses a more serious threat.

Damages and threats to livelihood

The villages are home to around 260 farmers who own and cultivate cash crops and vegetables. These farmlands provide livelihood for around 500 to 600 villagers who work on these lands as agricultural wage workers. Men, women, children and the elderly, all face the threat of animal attack. Men face problems with moving in and out of the village while travelling for work. Women find it difficult to move around about the village premises to get water and other materials after dark. Elderly people are most vulnerable to animal attacks and need protection. Unsupervised roads and lack of transportation leave children susceptible to animal attacks while walking between villages to access schools. The forest department has notified the villagers to not travel alone in and out of the forest after 6 p.m. Farmers are the most affected and they are usually left to bear the burdens of their economic loss.

4 out of 11 people have suffered property and livestock damage. 2 out of 11 people have been severely injured due to animal attacks, while all 18 respondents have had frequent animal encounters. 5 out of 7 farmers face serious crop damage and ruining of fences due to crop raiding and stampede.

Challenges faced by the forest department

The primary concern of the forest department is inadequate funds (Mohan, 2021). They are also heavily understaffed to carry out mitigation measures and protection strategies. They also face the problem of detecting and monitoring animals as they constantly migrate, which is difficult without the appropriate technology and equipment.

Installation and maintenance of high-powered technologies that use motion sensors or image processing to detect and monitor animal movements is a challenging task as they are cost-intensive. As is setting up early warning systems and alarms, training anti-depredation teams to for all round vigilant and surveillance also require qualified personnel which the department severely lacks (Singh et al., 2016).

Mitigation measure employed by respondents

The Sirumugai forest department has appointed competent staff that protect and preserve forests. Their institution includes 6 forest guards, 6 watchers and 2 foresters and assistant staff. They work under a forest ranger appointed for the whole beat, who in turn is accountable to the District Forest Officer. The local community uses their traditional methods in handling conflicts such as firecrackers, traditionally made equipment such as spears and sticks, barricades, hanging barrier clothes, high-intensity flashlights etc.

Farmers have installed low-current electric and solar fences, and either watches their farmlands on their own or have employed watchers to guard the farm at night. The forest department has appointed a 24/7 vigilance team to watch animal movement. The squad monitors animal movements and migration pattern, maps vulnerable locations and hot spot zones, collaborates with NGOs, conducts awareness sessions, and employs protection protocol and wildlife conservation measures. Data about animal activity, mortality and injury are recorded in a specially designed government application. They have also established a communication network to warn each other and forest guard up on sighting any animal activity or movement in the villages.

Suggestions

- Through eco-tourism, the community can be trained in managing and maintaining the natural resources which also puts them in a position to protect the indigenous varieties and animals. Sustainable eco-tourism encourages and empowers the local community to conserve wildlife (Surrey et al., 2022).
- Forming community-based initiatives that will educate and empower the local community through community-led programmes that highlight the importance of conservation can help prepare and mitigate the conflict (Meyer & Börner, 2022).
- Providing training and capacity building for community people can build their defence mechanisms and resilience to sustain with available resources and handle conflict consciously and effortlessly.
- Opting for community fences is cost-effective and cost-friendly compared to individual fencing. Bio-fences are also another sustainable and affordable method. Livestock can be protected from predators through training guard dogs and donkeys. Fencing can also help with protecting livestock and another useful way is to change livestock management practices (Chandra, 2023).
- Encouraging farmers to shift to crops that don't attract animals out of the forest and also give them equally close profits.
- Installation of non-disruptive technology-based mechanisms and forewarning systems for detecting and monitoring animal activity and movement that are also cost-effective (Ramesh et al., 2017).
- Requesting the government for a strong funding system, that can help with upgrading the rescue and vigilance squad, increasing compensation for losses, and providing insurance support to farmers.

V. CONSLUSION

Conservation of biodiversity has to be made the number one priority in the coming years and mitigating human-animal conflict can contribute greatly to achieving sustainability and harmony. Rural areas and villages contribute highly in the management and maintenance of ecosystems and surrounding biospheres. Through a holistic and collaborative community-based approach, the right decision making and quick problem-solving strategies, harmony can be achieved by controlling human-animal conflict and promoting life and livelihood both in and around the forests.

The study provides future scope to explore the dimensions of effects and losses of humans and animals in rural areas.

REFERENCES

1] Allen, B. L., Bobier, C., Dawson, S., Fleming, P. J. S., Hampton, J., Jachowski, D., Kerley, G. I. H., Linnell, J. D. C., Marnewick, K., Minnie, L., Muthersbaugh, M., O'Riain, M. J., Parker, D., Proulx, G., Somers, M. J., & Titus, K. (2023). Why Humans Kill Animals and Why We Cannot Avoid It. Science of the Total Environment, 896.

2] Chandra, R. (2023). Human-Animal Conflict and The Biodiversity in the Indian Perspective. South Asian Law Review Journal, 9.

3] Dahal, N. K., Harada, K., Adhikari, S., Sapkota, R. P., & Kandel, S. (2022). Impact of Wildlife on Food Crops and Approaches to Reducing Human Wildlife Conflict in the Protected Landscapes of Eastern Nepal. Human Dimensions of Wildlife, 27(3).

4] Iqram Arshath S, Gayathri S, & Rajeshkumar S. (2020). Study on Comparative Assessment of Human Tolerance Towards Wildlife in Coimbatore District (Karamadai, Thondamuthur & Periyanaickenpalayam), Tamil nadu. Kongunadu Research Journal, 7(2).

5] Mathivanan, A. (2019, April 26). Posters in Forest Villages to Avert Man-animal Conflicts. Deccan Chronicle.

6] Meyer, M., & Börner, J. (2022). Rural livelihoods, community-based conservation, and human–wildlife conflict: Scope for synergies? Biological Conservation, 272

7] Mohan, V. (2021, March 17). 16 States Have Cut Forest Dept Budget. Times of India.

8] Narayan, E., & Rana, N. (2023). Human-wildlife Interaction: Past, Present, and Future. BMC Zoology (Vol. 8, Issue 1).

9] Ramakrishnan. B, Arivazhagan. C, Gunasekaran. M, Karthich. S, & Ilakkia. M. (2016). Human-Animal Conflict Issues in the Gudalur Reserve Forest Division of the Nilgiris, Tamil Nadu, Southern India - A Case study. Scientific Transactions in Environment and Technovation, 9(1).

10] Ramesh, G., Mathi, S., Pulari, S. R., & Krishnamoorthy, V. (2017). An Automated Vision-based Method to Detect Elephants for Mitigation of Human-elephant Conflicts. International Conference on Advances in Computing, Communications and Informatics, ICACCI.

11] Schell, C. J., Stanton, L. A., Young, J. K., Angeloni, L. M., Lambert, J. E., Breck, S. W., & Murray, M. H. (2021). The Evolutionary Consequences of Human–wildlife Conflict in Cities. Evolutionary Applications, 14(1).

12] Sekar, T. (2013). Dimensions of Human-Wildlife Conflict in Tamil Nadu. Indian Forester, 139(10).

13] Senthilkumar, K., Mathialagan, P., Manivannan, C., Gomathinayagan, S., & Jayathangaraj, M. G. (2016). Human-elephant Conflict: Case Study from Tamil Nadu. International Journal of Science, Environment and Technology, 5(2).

14] Singh, A., Ramesh, M. V., & Divya, P. (2016). Design and Simulation of Elephant Intrusion Detection System. International Workshop on Computer Science and Engineering, WCSE.

15] Surrey, K. C., Hawley, C. R., Davis, O. N., Clements, J. L., Bernat, I., & Gerber, L. R. (2022). Refining the Ecosystems Services Model: Integrating Animal Behavior into Ecotourism Management. Imperiled: The Encyclopedia of Conservation: Volume 1-3 (Vols. 1–3).

16] The World Bank. (2023, November 9). Human-Wildlife Conflict: Global Policy and Perception Insights. The World Bank Briefs.

17] Thomas, W. (2019, April 24). Sirumugai Residents Told to be Wary of Elephants. The Hindu.

18] Yng, T. K., & Hasan, N. N. N. (2022). Human–Wildlife Conflicts and the Impact on Local Communities' Support for Khao Yai National Park, Thailand. Parks, 28(1).