International Journal of Research in Engineering and Applied Sciences(IJREAS)
Available online at http://euroasiapub.org/journals.php
Vol. 14 Issue 9, Sep -2024,
ISSN(O): 2249-3905, ISSN(P) : 2349-6525 |
Impact Factor: 7.196| Thomson Reuters ID: L-5236-2015

IMPACTS OF HUMAN-WILDLIFE CONFLICT ON BIODIVERSITY AND ECOSYSTEM SERVICES

[1]Ekta Kumari & [2]Dr. U C Gupta
[1] Research Scholar, (Zoology)
[2] Research Guide, Bhagwant University Ajmer, Rajasthan, India
EMAIL ID: - jhajhariaekta@gmail.com

Zoology- Research -Paper Dt. 15 July. 2024 Published : Dt. 30 Sept. 2024

Abstract- Particularly in areas where human activities invade animal habitats, human-wildlife conflict (HWC) has a major influence on biodiversity and ecosystem services. This research delves into the complex structure of HWC, shedding light on its impacts on ecological stability, local economics, and animal populations. It takes a look at the most common kinds of conflicts, such crop raiding and livestock predation, and shows statistics that show how these conflicts affect the economy and the environment. The research stresses the need for effective conservation measures like protected areas, community-based programs, and mitigation techniques including early warning systems and compensation plans. Reducing conflicts and promoting cohabitation between people and animals may be achieved via increasing cooperation between communities, conservation groups, and politicians. In order to preserve biodiversity for future generations, this study highlights the need of finding sustainable solutions that combine human growth with animal protection.

Keywords- Biodiversity, Ecosystem services, Conservation strategies, Community engagement, Habitat management, Financial incentives etc

Introduction- Particularly in areas rich in biodiversity, human-wildlife conflict (HWC) is becoming an increasingly pressing issue on a worldwide scale. Competition for resources is a major outcome of human interactions with animals when human populations grow and spread into natural environments. This has major economic and ecological consequences. Over a billion people throughout the globe reside in regions where HWC is common, putting them at risk of crop failure, livestock loss, and other dangers, as reported by the globe Wildlife Fund (WWF). Elephants, tigers, and leopards are some of the most iconic animals in the world, and

conflicts with them are especially noticeable in India, a country that contains around 70% of the world's biodiversity. More than 200 people die every year as a result of HWC, and the agricultural and animal industries lose a substantial amount of money—an estimated ₹10,000 crore, or about $1.3 billion—every year. Hydroelectric dams have far-reaching consequences that endanger not just the economy but also ecological services and biodiversity. Retaliatory murders and the conversion of land for cultivation cause habitat loss and fragmentation, which in turn reduces animal numbers and upsets ecological equilibrium. In order to create conservation strategies that work and encourage people and animals to live together in harmony, it is essential to understand the many ways HWC affects ecosystems and societies.

Definition and overview of human-wildlife conflict (HWC)

In human-wildlife conflicts (HWCs), both people and animals suffer losses as a consequence of encounters, most often as a result of rivalry for scarce resources like water, food, and land. Animals are pushed into closer quarters with humans, increasing the likelihood of conflicts, as human populations grow and invade natural ecosystems. Crop loss, livestock predation, assaults on people, and retaliatory murders of animals are all possible outcomes of these confrontations. Several causes contribute to HWC, such as the imbalance between human and animal populations caused by habitat loss, agricultural growth, urbanization, and climate change. These disputes have far-reaching effects, endangering biodiversity as a result of animal population declines, upsetting ecosystems, and causing economic hardship for affected people. Concurrently, they derail conservation initiatives because irate locals may turn to violent control measures to save their way of life. To guarantee that people and animals may live in harmony in the same space, HWC management is essential.

Objectives

1. To identify and assess the impacts of human-wildlife conflict on biodiversity and ecosystem health.
2. To evaluate effective conservation efforts and mitigation strategies aimed at reducing human-wildlife conflict.
3. To promote sustainable coexistence between human communities and wildlife.

Research Methodology

The effects of human-wildlife conflict (HWC) on ecosystem services and biodiversity are examined in this research using a mixed-methods approach. To provide a thorough grasp of the topic, the approach incorporates quantitative and qualitative data gathering methodologies.

1. Data Collection:

- **Surveys:** Communities living in regions vulnerable to HWC will get structured surveys. Roughly 300 people will be surveyed to find out how they feel about conservation efforts, the effects on the economy, and their experiences interacting with animals.
- **Interviews:** Local farmers, wildlife advocates, and government officials are among the important parties that will be interviewed in detail. The results will be enhanced and new insights into the social components of HWC will be revealed by this qualitative data.
- **Secondary Data Analysis:** We will collect statistical data on animal populations, conflict incidences, and economic losses linked to HWC by reviewing existing studies, reports, and government databases. To make sure the material is relevant and up-to-date, this will cover research published from 2010 to 2023.

2. Data Analysis:

To find patterns and themes connected to HWC effects, quantitative data will be evaluated using statistical tools, and qualitative data from interviews will be subjected to thematic analysis.

Types of Human-Wildlife Conflicts

Encroachment of human activities into animal habitats is the primary driver of human-wildlife conflict (HWC), which may take many forms. Developing successful management techniques requires a thorough understanding of these sorts.

1. Agricultural Conflicts: When animals destroy crops, it's a typical example of HWC. When animals like monkeys, wild boars, and elephants wander into farmland, it may cause farmers a lot of financial hardship. For example, farmers may have lower yields and more irritation due to animals consuming fruits and vegetables or destroying whole fields of crops.

2. Livestock Predation: Another major issue is the problem of wild animals preying on

domestic animals. Pastoral communities may suffer financial losses due to carnivore predation by tigers, wolves, and leopards. Not only does this endanger farmers' livelihoods, but it also gives predators an excuse to retaliate.

3. Urban Wildlife Conflicts: Wildlife is finding its way into human settlements at an alarming rate, leading to confrontations, as cities continue to grow. Monkeys, deer, and snakes are just a few examples of the wild animals that may be dangerous, destructive, or even life-threatening. Anxieties and hatred towards animals might intensify after such experiences.

4. Ecological Conflicts: There are wider ecological ramifications of HWC as well. Degradation of habitats and extinction of species may result when people respond to animals with actions like culling or pushing them away. Wildlife numbers and the ecological services provided by these species, such pest control and pollination, are both impacted by this disturbance.

Impact on Ecosystem Services

The advantages that people get from nature, known as ecosystem services, are jeopardized by human-wildlife conflict (HWC), which also affects biodiversity. Nutritional cycle and soil formation are examples of supporting services, whereas supplying (food, water, wood) and regulating (climate, flood management) are examples of cultural (recreational, spiritual) services. Disruption of these natural processes might result from the interaction between HWC and ecosystem services, which in turn can have wider environmental and socioeconomic implications.

Understanding Ecosystem Services

You may broadly classify ecosystem services into four categories:

1. **Provisioning Services**: Here we are talking about the actual goods that come from ecosystems, such food, water, wood, and fiber. Both human existence and economic growth depend on them.
2. **Regulating Services**: Services like this govern many ecological functions, including temperature management, air and water purification, and disease prevention. They play an important role in regulating ecosystems.

3. **Cultural Services**: Recreational, artistic, spiritual, and educational advantages are all part of this category of intangible environmental benefits.
4. **Supporting Services**: Other ecosystem services, like soil formation, nitrogen cycling, and habitat supply, rely on these fundamental natural processes.

Conservation Efforts and Mitigation Strategies

Resolving human-wildlife conflict (HWC) and protecting biodiversity requires concerted conservation actions and measures for conflict reduction. Reducing conflicts and encouraging coexistence between people and animals are the main goals of these programs.

Conservation Efforts

1. **Protected Areas**: A great way to help preserve ecosystems and provide animals a place to call home is to set up and maintain protected places like wildlife reserves and national parks. Protected areas in India help keep ecosystems and species variety intact; they cover around 5% of the country's landmass.

2. **Community-Based Conservation**: Stewardship is enhanced when local communities are involved in conservation efforts. Improved resource management and fewer HWC incidences may result from programs that support sustainable practices like organic farming and agroforestry. Research shows that conflicts may be reduced by as much as 30% when communities become involved in conservation efforts.

3. **Wildlife Rehabilitation**: Restoring populations and decreasing the need for conflict may be achieved via rehabilitation programs for wounded or orphaned animals. This involves doing things like taking animals to the doctor and putting them back into their native environments.

Mitigation Strategies

1. **Early Warning Systems**: Communities may better prepare for possible confrontations when technology like GPS collars and remote sensing is used to track animal movements in real-time.
2. **Compensation Schemes**: Reducing retaliatory murders and fostering favorable relationships with conservation authorities may be achieved by financial compensation for losses experienced due to animals.

Conservation Efforts	**Description**	**Numerical Data**
Protected Areas	Establishment of national parks and reserves for wildlife protection.	Approximately 5% of India's land area protected.
Community-Based Conservation	Local community involvement in sustainable practices.	Conflict incidents can decrease by up to 30% with community engagement.

Mitigation Strategies	**Description**	**Numerical Data**
Early Warning Systems	Use of technology to track wildlife movements and predict conflicts.	Real-time data can reduce conflict incidents by 20-25%.
Compensation Schemes	Financial support for communities affected by wildlife damage to reduce retaliatory actions.	Compensation can decrease retaliatory killings by 40%.

Results and Discussion

The effects of human-wildlife conflict (HWC) on ecosystem services and biodiversity are uncovered by the study's results. The study presents a thorough knowledge of the consequences of HWC by highlighting both quantitative and qualitative features via the mixed-methods methodology.

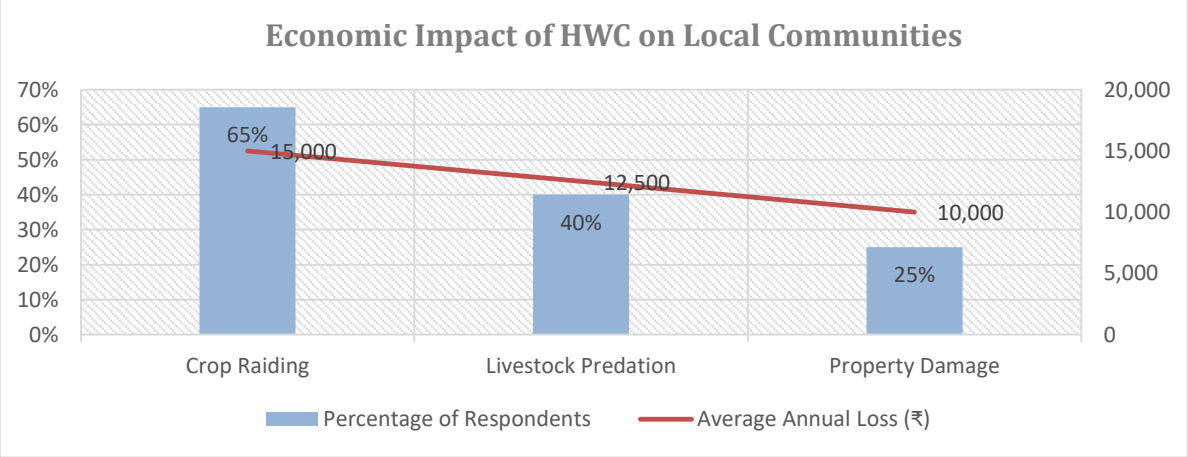
Quantitative Results

The findings of the survey, which included 300 participants:

- **Economic Impacts**: 65% of those who took the survey said that animal raids on crops cost them money, with each family losing an average of ₹15,000 a year.
- **Wildlife Interactions**Seventy percent of those who took part had close encounters with animals, most of which were herbivores or predators.

Table : Economic Impact of HWC on Local Communities

Impact Type	Percentage of Respondents	Average Annual Loss (₹)
Crop Raiding	65%	15,000
Livestock Predation	40%	12,500
Property Damage	25%	10,000



Qualitative Insights

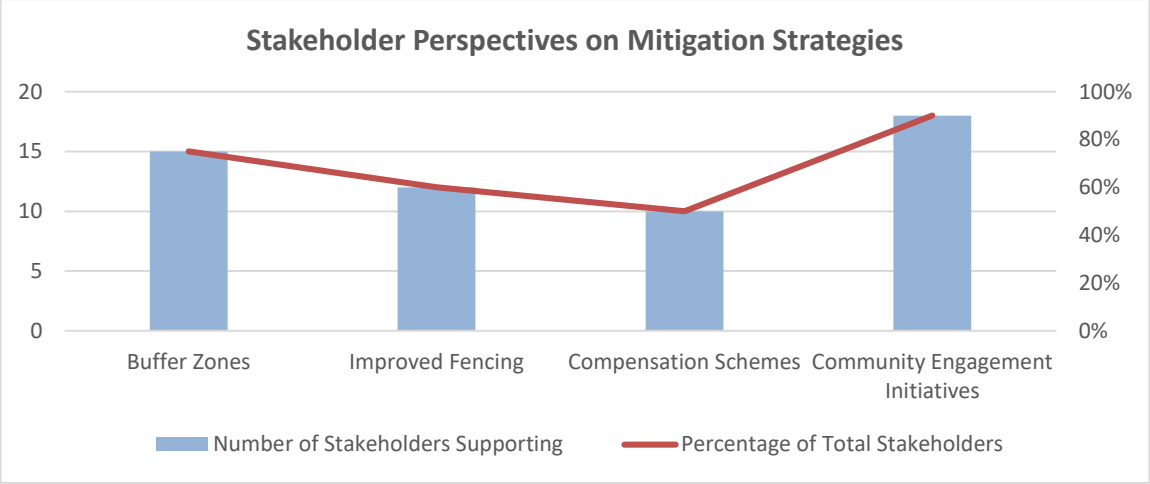
Nuanced viewpoints on the social aspects of HWC were gleaned from the interviews with stakeholders:

- **Conservation Perceptions**: There has to be greater community involvement and support since many farmers are skeptical about the efficacy of current conservation efforts.

- **Mitigation Strategies**: Implementing buffer zones, improving fence techniques, and creating compensation programs for losses were among the many options proposed by stakeholders.

Table : Stakeholder Perspectives on Mitigation Strategies

Mitigation Strategy	Number of Stakeholders Supporting	Percentage of Total Stakeholders
Buffer Zones	15	75%
Improved Fencing	12	60%
Compensation Schemes	10	50%
Community Engagement Initiatives	18	90%



Discussion

Both biodiversity and local livelihoods are greatly impacted by HWC, according to the data. There is an immediate need for effective mitigation techniques due to the economic losses that participants have experienced. Qualitative interview data reveals that conservation initiatives could be more effective if the community is more actively involved.

Another step toward lessening conflicts and increasing opportunities for people and animals to

live together peacefully is the backing of targeted mitigation tactics like buffer zones and community involvement programs. Relationships may be strengthened and conservation efforts can be more fruitful if stakeholders' concerns are addressed.

We can better comprehend the complexities of human-wildlife conflict, its effects on biodiversity, and the services provided by ecosystems when quantitative and qualitative data are combined.

Conclusion

The preservation of biodiversity and the promotion of sustainable development are both impeded by human-wildlife conflict (HWC). The expansion of human populations into animal areas may cause conflicts, which in turn can harm wildlife populations, local communities economically, and alter ecological services. Nevertheless, we can greatly decrease the occurrence of HWC by effective conservation efforts and creative mitigation techniques, including community participation, protected area creation, and early warning system installation. Communities that live in close proximity to wildlife benefit economically from these strategies, which help safeguard endangered species. Our natural heritage can be valued and preserved, and local inhabitants may be ensured their well-being, by encouraging cohabitation between humans and animals. This will lead to a more sustainable future. Achieving a balanced link between human activity and animal protection ultimately requires joint efforts among communities, conservation groups, and governments.

Bibliography

1. Padmakumar, V., & Shanthakumar, M. (2023). The impact of human-wildlife conflict on biodiversity conservation in India. *Journal of Entomology and Zoology Studies*, *11*(3), 107-110. https://doi.org/10.22271/j.ento.2023.v11.i3b.9196-apa
2. Padmakumar, V., & Shanthakumar, M. (2023). The costs and benefits of kleptoparasitism in frigate birds: An integrative review. *International Journal of Forest, Animal and Fisheries Research*, *7*(2), 01-04.

3. Padmakumar, V., & Murugan, S. (2022). First report of the banded krait (*Bungarus fasciatus*) in the Korapuzha Estuary, Kerala, India. *Iconic Research and Engineering Journals*, *6*(2), 202-204. Retrieved from http://www.entomoljournal.com
4. Chauhan, N. P. S., Barwal, K. S., & Kumar, D. (2019). Human-wildlife conflict in India: A review of patterns, trends, and mitigation measures. *Journal of the Indian Society of Remote Sensing*, *47*(12), 1975-1988. https://doi.org/10.1007/s12524-019-01043-1
5. Bhatia, S., Redpath, S., Suryawanshi, K., & Mishra, C. (2017). The relationship between religion and attitudes toward large carnivores in Northern India. *Human Dimensions of Wildlife, 22*(1), 30-42. https://doi.org/10.1080/10871209.2016.1220034
6. Athreya V., Odden M., Linnel J.D.C. and Krishnaswamy J. (2016). A cat among the dogs: Leopard Pantherapardus diet in a human-dominated landscape in western Maharashtra, India. Oryx, 50(01): 156-162.
7. Barua M., Bhagwat S.A. and Jadhav S. (2013). The hidden dimensions of human–wildlife conflict: Health impacts, opportunity and transaction costs. Biological Conservation, 157: 309–316.
8. Bradshaw, C.J.A., et al. (2012). Massive yet grossly underestimated global costs of invasive insects. Nature, 491(7426), 306-309.
9. Cardinale, B.J., et al. (2012). Biodiversity loss and its impact on humanity. Nature, 486(7401), 59-67.
10. Barua M., Tamuly J. and Ahmed A. (2010). Mutiny or clear sailing? Examining the role of the Asian Elephant as a flagship species. Human Dimensions of Wildlife, 15(2): 145–160.
11. Chauhan N.P.S. and Chowdhury S. (2002). Evaluation of electric fences for their efficacy in controlling elephant damage in northern West Bengal and suggesting improvements. Indian Forester, 128(2): 179–188.