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Human-Wildlife Conflict and its Impact on Tourism in Manas and Kaziranga National Parks

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Abstract: In this research paper, I have thoroughly described the topic "Human-Wildlife Conflict and its Impact on Tourism in Manas and Kaziranga National Parks." Human-wildlife conflict (HWC) in Assam's Manas and Kaziranga National Parks—both UNESCO World Heritage Sites—poses a significant threat to biodiversity conservation and sustainable tourism. These parks, home to endangered species like the one-horned Rhinoceros, Bengal tiger, and Asian elephant, face escalating conflicts due to habitat fragmentation, agricultural expansion, and climate-induced flooding. Such conflicts result in crop damage, livestock predation, and human fatalities, triggering retaliatory killings and strained community relations. The tourism sector, a vital economic driver, suffers due to safety concerns, declining wildlife visibility, and infrastructure damage. Data reveals a 15% drop in Kaziranga's peak-season tourism and a 20% decline in foreign visitors to Manas over five years, leading to annual revenue losses of INR 2 cr. and INR 80 lakh, respectively. Poaching exacerbates the crisis, with Kaziranga reporting 25+ incidents in five years, while infrastructure damages cost INR 1.5 cr. (Kaziranga) and INR 50 lakh (Manas) in 2022 alone. Mitigation strategies—such as eco-tourism zones, drone surveillance, and community compensation (INR 4 lakh per fatality)—show promise but require scaling. Effective solutions demand integrated approaches: habitat restoration, wildlife corridors, and participatory conservation programs. Balancing ecological integrity with tourism growth is critical to safeguarding these parks' global significance, ensuring economic stability 1 for local communities, and preserving India's natural heritage. Without urgent intervention, persistent conflicts risk further tourism decline, undermining both conservation and livelihoods in these ecologically fragile regions.

Keywords: *Human-Wildlife Conflict, UNESCO World Heritage Sites, Fragmentation, Crop Damage, Livestock Predation, Human Fatalities.*

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I. INTRODUCTION

In protected regions like Assam's Manas and Kaziranga National Parks, human-wildlife conflict is a major problem that affects both conservation efforts and the area's booming tourism sector. The extraordinary biodiversity of these UNESCO World Heritage Sites, which include endangered species like the Asian elephant, Bengal tiger, and one-horned rhinoceros, is well known across the world. However, confrontations between local populations and animals have gotten worse due to growing agricultural development, habitat fragmentation, and human encroachment. On the other hand, Retaliatory killings of innocent animals by local people and poor relations between conservation officials and locals have resulted crop devastation, animal predation, and sporadic human deaths. In addition to endangering the existence of important species, these disputes also seriously jeopardize the viability of wildlife tourism, which is a significant source of income for Assam. The distinctive flora and fauna of these parks draw tourists all parts of the country and all over the world, but frequent interactions between people and wildlife, poaching, and safety issues may cause visitor numbers to drop. Furthermore, the issue is made worse by the destruction of natural ecosystems brought on by unauthorized settlements, deforestation, and infrastructure expansion in the protected forest areas. Resolving these problems calls for a well-rounded strategy that incorporates sustainable tourism approaches that reduce conflicts between people and animals and places equal emphasis on conservation and the well-being of local populations. While guaranteeing the tourist industry's continuous expansion, effective mitigation techniques including buffer zones, eco-

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friendly tourism projects, and community-based conservation programs may promote coexistence of human and wildlife. In order to improve conservation and the development of sustainable tourism in these environmentally vulnerable locations, this study is to investigate the nature and causes of human wildlife conflicts in Manas and Kaziranga National park of Assam, evaluate their direct and indirect effects on tourism, and provide solutions.

➢ *Research Objectives*

- To analyse the causes and frequency of human-wildlife conflicts in Manas and Kaziranga National Parks.
- To assess the impact of human-wildlife conflicts on tourism activities and visitor experiences in these parks.
- To evaluate conservation and conflict mitigation strategies and their effectiveness in sustaining tourism.

II. REVIEW OF LITERATURE

➢ *Pradhan, S. M., & Choudhury, S. (2024)*

The authors look at human-wildlife conflict in Manas National Park, Assam, India, and highlights the complicated interplay between indigenous tribes, conservation initiatives, and development. It investigates how animal protection affects local livelihoods, as well as the issues faced by human encroachment on protected areas. The writers emphasize the need of sustainable development strategies that strike a balance between biodiversity protection and the socioeconomic demands of indigenous communities living near the park.

➢ *Saikia, A. A., & Goswami, C. (2021)*

Focusing on tourists' satisfaction with park features and their readiness to pay for park-related services, the authors undertake a comparative analysis of Kaziranga and Manas National Parks. The paper evaluates elements affecting tourist experiences—including wildlife, infrastructure, and services—to determine their effect on visitor satisfaction. It also investigates how these elements interact with visitors' desire to donate money, hence stressing the need of park management in improving visitor experiences and producing conservation money.

➢ *Chakrabarty, P., Pan, S., &Mandal, R. (2019)*

Within the geo-tourism landscapes of Manas and Kaziranga National Parks in Assam, India, the authors investigate the potential of promoting wildlife tourism. The study emphasizes the tourist attraction of both parks by emphasizing their distinctive geological and ecological characteristics. It examines sustainable tourism development strategies that are designed to strike a balance between economic benefits and environmental conservation. The authors propose that the integration of geo-tourism and wildlife 3 tourism can improve the experiences of visitors, while simultaneously preserving natural resources and sustaining local communities.

III. ABOUT THE STUDY AREA

A. Manas National Park

Manas National Park, spanning 2,837 sq. km, is situated in the foothills of the Eastern Himalayas in Assam, India, Manas National Park is an elephant reserve, Project Tiger reserve, and UNESCO World Heritage Site. It serves as a Project Tiger Reserve, a Biosphere Reserve, and an Elephant Reserve, with diverse habitats such as semi-evergreen forests, grasslands, and wetlands.

It is renowned for its remarkable biodiversity and borders Bhutan's Royal Manas National Park to the north. Rare and endangered species such as the Assam roofed turtle, hispid hare, golden langur, pygmy hog, and wild water buffalo may be found there. The Manas River, a significant tributary of the Brahmaputra River that runs through the centre of the park, is the source of its name. Prior to the Duar War in 1865, the area was a part of the Kingdom of Bhutan; following that, it was given to British India. In 1928, it was designated as a wildlife sanctuary, and in 1990, it was enlarged to become a national park. Panbari, Bansbari, and Bhuiyapara are the three ranges that make up the 950 square kilometer park. Its varied terrain, which supports a wealth of flora and animals, consists of savanna, riverine meadows, and deep woods. With temperatures between 15°C and 37°C and intense monsoonal rainfall from May to September, the park has a subtropical climate. Because nearby villages rely on the park's resources, human-wildlife conflict persists despite conservation efforts.

B. Kaziranga National Park

Kaziranga National Park, covering 430 sq. km. is located in Assam’s Golaghat, Sonitpur, Biswanath, and Nagaon districts, is a UNESCO World Heritage Site and home to two-thirds of the world's Indian rhinoceroses.

The park spans five ranges and supports large breeding populations of elephants, wild water buffalo, swamp deer, and various bird species, making it an Important Bird Area. Kaziranga National Park is established as a reserve forest in 1905 and declared a Tiger Reserve in 2006, and finally 1968 the park is declared as National Park. Kaziranga has achieved remarkable conservation success. The landscape features tall elephant grass, marshlands, tropical broadleaf forests, and four major rivers, including the Brahmaputra.

Its name has multiple origin stories, with legends linking it to lovers Kazi and Rawnga, a childless couple named Kazi and Rangai, or the Karbi words meaning "land of red goats" or “village of Kajir." With a rich biodiversity and cultural significance, Kaziranga continues to be a focal point for wildlife conservation and ecotourism in India.

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IV. RESEARCH METHODOLOGY

This study employs a mixed-methods approach, combining both qualitative and quantitative research methods to explore the impact of human-wildlife conflict (HWC) on tourism in Manas and Kaziranga National Parks. The research is designed to analyze the causes, effects, and mitigation strategies associated with HWC in these parks and their subsequent impact on tourism activities.

A. Research Design

The study adopts a descriptive and analytical research design. Descriptive methods are used to provide a detailed overview of the nature of human-wildlife conflicts in both national parks. Analytical methods are employed to assess the direct and indirect effects of these conflicts on tourism, including changes in tourist footfall, revenue loss, and the impact on infrastructure. By comparing the two parks, the research aims to draw out common trends and challenges faced in terms of HWC and tourism sustainability.

B. Data Collection

The study utilizes both primary and secondary data sources to gather comprehensive insights.

➢ *Primary Data*

- Surveys and Questionnaires: Structured surveys are conducted with tourists visiting both parks to assess their experiences and satisfaction levels. Questions focus on perceptions of safety, wildlife encounters, and willingness to pay for park-related services. Additionally, local communities, park authorities, and tourism operators are interviewed to gather insights into the frequency and causes of HWC and its impact on their livelihoods.
- Field Observations: The researcher observes interactions between wildlife and local communities, especially in areas prone to conflict. These observations provide first-hand accounts of wildlife behaviour and the socio-economic challenges faced by local residents.
- Interviews with Park Authorities and Experts: Semi-structured interviews with conservationists, park managers, and local wildlife experts are conducted to gain an understanding of current conservation efforts, the effectiveness of mitigation strategies, and the challenges of balancing wildlife protection with tourism development.

➢ *Secondary Data*

- Tourism Reports: Data from Assam's Tourism Department and park management agencies are analysed to track tourist numbers, revenue generation, and incidences of HWC over the past five years.
- Published Literature: Previous studies, research papers, and government reports are reviewed to provide context for the current situation and to understand historical trends in human-wildlife conflicts and tourism in these parks.

V. DATA ANALYSIS

Quantitative data from surveys and official tourism statistics are analysed using statistical tools to identify trends and correlations. The qualitative data from interviews and field observations are analysed thematically to uncover the underlying causes of conflicts and their broader impact on local communities and tourism. A comparative analysis of the two parks— Kaziranga and Manas—helps in understanding the differing dynamics and challenges faced by each.

A. Ethical Considerations

In conducting interviews and surveys, informed consent is obtained from all participants, ensuring confidentiality and the voluntary nature of participation. The study also adheres to ethical guidelines in handling sensitive data related to human-wildlife conflicts and community concerns.

This methodology allows for a holistic understanding of the complex relationship between wildlife conservation and tourism in protected areas, providing evidence-based recommendations for mitigating conflicts and ensuring sustainable tourism practices.

B. Human-Wildlife Conflict

The term "human-wildlife conflict" (HWC) describes interactions between people and animals that have detrimental effects on both, frequently as a result of competition for resources and space. Conflicts like crop destruction, livestock predation, and assaults on people arise due to human activities like expansion of agriculture, deforestation, and urbanization encroach on wildlife areas. People may retaliate by poaching, destroying habitat, or taking other actions that endanger the preservation of animals. In regions with abundant biodiversity, like Assam's Manas and Kaziranga National Parks, where animals like elephants, tigers, and rhinos often interact with local populations, this conflict is especially acute. Such interactions affect livelihoods and tourism in addition to upsetting the natural equilibrium. In order to guarantee that people and wildlife co-habit while preserving ecological integrity and economic stability, addressing HWC calls for a comprehensive strategy that includes habitat conservation, community involvement, and sustainable tourism tactics.

C. Causes of Human-Wildlife Conflict

➢ *Habitat Destruction & Encroachment:*

As human populations expand, forests and grasslands are cleared for agriculture, urbanization, and infrastructure, leading to habitat destruction. This encroachment forces wildlife into smaller, fragmented areas, increasing human-wildlife interactions as animals search for food and shelter, often entering human settlements and causing conflict.

➢ *Human Activities in Wildlife Areas*

Illegal activities like logging, mining, and over harvesting of forest resources disrupt wildlife habitats. These activities bring humans and animals into closer contact, causing stress for wildlife and disrupting their natural behaviours. Such disturbances often lead to increased

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conflict, including crop damage, livestock predation, and attacks on humans.

➢ *Agricultural Expansion & Crop Raiding*

As agriculture expands, wildlife such as elephants, wild boars, and deer are drawn to crop fields in search of food. This increases the likelihood of crop raiding, which results in financial losses for farmers. Retaliatory actions by locals, like poisoning or hunting, worsen the conflict, further endangering species.

➢ *Poaching & Retaliatory Killings*

Poaching for body parts like horns and tusks is a significant threat to wildlife, especially in areas with endangered species. Retaliatory killings by local communities, prompted by crop destruction or attacks on livestock, further exacerbate the situation, contributing to a cycle of violence that jeopardizes conservation efforts.

➢ *Infrastructure Development*

Roads, dams, and urban expansion often fragment wildlife habitats, obstructing migration corridors. As wildlife is forced to cross human settlements or roads, encounters increase, leading to vehicle collisions, property damage, and loss of life. Infrastructure development also brings more people into proximity with wildlife, intensifying the potential for conflict.

➢ *Seasonal Flooding in Kaziranga*

Seasonal flooding in Kaziranga National Park forces animals to migrate to higher ground, often pushing them into nearby villages. This leads to crop destruction, livestock killings, and human fatalities as animals, particularly elephants and rhinos, venture into human settlements in search of food and shelter during flood events.

➢ *Tourism & Human Disturbance*

While tourism provides economic benefits, it can disrupt wildlife, especially in sensitive areas during breeding seasons. Increased noise, vehicle traffic, and human presence can stress animals, making them more likely to move into human settlements. Tourists sometimes feed or provoke wildlife, further escalating the risk of conflict.

➢ *Climate Change & Resource Scarcity*

Climate change alters rainfall patterns, temperatures, and vegetation, causing resource scarcity for wildlife. As animals search for food and water, they often encroach on human-dominated areas, leading to increased interactions and conflicts. This exacerbates the pressure on wildlife populations and increases the likelihood of confrontations with local communities.

➢ *Lack of Effective Conflict Management Strategies*

Inadequate conflict management strategies, such as insufficient monitoring, ineffective policy enforcement, and lack of community involvement, hinder efforts to reduce human-wildlife conflict. Without proper conflict resolution mechanisms, local communities may resort to retaliation, further exacerbating the problem and undermining conservation efforts and sustainable tourism.

D. Impact of Human-Wildlife Conflict on Tourism in Manas and Kaziranga National Parks:

Human-wildlife conflict (HWC) poses significant challenges to the tourism industry in Manas and Kaziranga National Parks, two of India's most important biodiversity hotspots. These conflicts arise due to habitat encroachment, poaching, and increasing human settlements around park boundaries, affecting both wildlife conservation and sustainable tourism. Following are some significant impact of HWC on tourism sector of Assam in connection with Manas and Kaziranga national Park.

➢ *Decline in Tourist Footfall*

Tourism is one of the primary sources of revenue for both national parks. However, recurring human-wildlife conflicts, such as attacks on local communities and destruction of property by animals, deter tourists. Data from the Assam Tourism Department (2022) reveals a 15% decline in tourist visits to Kaziranga during peak seasons due to increased incidents of human-wildlife encounters. In Manas, the impact has been even more severe, with foreign tourist arrivals dropping by 20% in the past five years due to safety concerns.

➢ *Revenue Loss and Economic Impact*

The decline in tourist numbers directly affects the local economy. Many local communities depend on tourism for their livelihood, working as guides, lodge owners, and transport providers. A report from the Assam Forest Department (2023) estimates that Kaziranga National Park generates INR 12–15 cr. annually from tourism, while Manas contributes around INR 4–6 crs. A 10–15% decline in visitors translates to an annual revenue loss of nearly INR 2 cr. for Kaziranga and INR 80 lakh for Manas.

➢ *Wildlife Poaching and Habitat Destruction*

Illegal activities such as poaching further escalate conflicts. Kaziranga, despite being a stronghold for Indian rhinoceroses, has witnessed more than 25 poaching incidents in the last five years. The presence of armed poachers makes the park unsafe for visitors, leading to negative media coverage and deterring tourists. Manas National Park, which was once on the UNESCO World Heritage in Danger list (1992–2011) due to poaching and insurgency, still struggles to rebuild its reputation.

➢ *Infrastructure Damage and Maintenance Costs*

Human-wildlife conflict leads to destruction of tourism infrastructure. Elephants and rhinos often stray into human settlements, damaging roads, lodges, and safari vehicles. In 2022, Kaziranga reported INR 1.5 cr. worth of damage to park facilities due to wildlife incursions, while Manas suffered over INR 50 lakh in damages. The Assam government and park authorities have had to increase spending on fencing, patrol units, and conflict-mitigation strategies, diverting resources away from tourism development.

E. Measures to Mitigate Conflict and Sustain Tourism:

Several measures have been taken to reduce HWC and its impact on tourism:

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- Eco-tourism Initiatives: Promoting controlled tourism zones to minimize disturbance to wildlife.
- Compensation for Affected Communities: The Assam government provides compensation of INR 4 lakh per human fatality caused by wildlife and covers property damages, fostering positive relationships between communities and conservation efforts.
- Improved Monitoring and Patrols: Use of drones and GPS tracking for real-time monitoring of wildlife movements to prevent poaching and conflicts.
- Community Participation in Conservation: Programs like eco-development committees (EDCs) encourage locals to act as conservation partners rather than antagonists.

Table 1: Tourism Impacts and Conflict-Related Losses in Kaziranga and Manas National Parks (2018-2023)

Factor	Kaziranga National Park	Manas National Park
Decline in Tourist Arrivals	15% drop in peak season	20% drop in foreign tourists
Revenue Loss	~INR 2 crore annually	~INR 80 lakh annually
Poaching Incidents (Last 5 years)	25+ cases	10+ cases
Infrastructure Damage (2022)	INR 1.5 crore	INR 50 lakh
Compensation for Human Fatalities	INR 4 lakh per case	INR 4 lakh per case

Source: Assam Forest Report (2023)

Human-wildlife conflict in Manas and Kaziranga significantly affects tourism by reducing visitor numbers, causing economic losses, and damaging infrastructure. While mitigation measures are in place, continuous efforts are required to balance wildlife conservation and sustainable tourism development. Addressing these conflicts effectively will not only enhance tourism revenue but also contribute to biodiversity conservation in these globally significant national parks.

VI. RESULT AND DISCUSSION

The study reveals that human-wildlife conflict (HWC) in Manas and Kaziranga National Parks has significantly impacted tourism through declining visitor numbers, economic losses, and infrastructure damage. Data indicates that a 15% drop in Kaziranga's peak-season tourism and a 20% decline in foreign tourist arrivals to Manas, primarily due to safety concerns and reduced wildlife visibility. These declines translate to substantial revenue losses—approximately INR 2 cr. annually for Kaziranga and INR 80 lakh for Manas—affecting local livelihoods dependent on tourism. Poaching exacerbates the issue, with Kaziranga reporting 25+ incidents in five years, undermining visitor confidence. Infrastructure damage, including roads and lodges, cost INR 1.5 cr. (Kaziranga) and INR 50 lakh (Manas) in 2022, diverting funds from tourism development.

Mitigation strategies, such as eco-tourism zones, drone surveillance, and community compensation (INR 4 lakh per fatality), show promise but require scaling. Community-based conservation programs have improved local engagement, yet habitat encroachment and climate induced flooding remain unresolved. The findings underscore the need for integrated approaches, including wildlife corridors, stricter anti-poaching measures, and sustainable land-use planning, to balance conservation and tourism. Without urgent intervention, persistent conflicts risk further tourism decline, threatening both biodiversity and regional economic stability. Strengthening policy enforcement and fostering community-led conservation will be crucial for long-term sustainability.

VII. RECOMMENDATIONS AND SUGGESTIONS

Following are some recommendations to address the issue human-wildlife conflict effectively:

- Strengthening Wildlife Corridors: Establish and maintain safe corridors connecting fragmented habitats to allow animals to move freely and avoid human settlements, reducing accidental encounters and ensuring genetic diversity.
- Using Early Warning Systems and Deterrents: Deploy technologies like motion sensors, alarms, electric fencing, and lights to alert communities of wildlife presence and deter animals from entering human areas, minimizing sudden confrontations.
- Implementing Community-Based Conservation Programs: Involve local communities in wildlife protection and management by integrating traditional knowledge, offering incentives, and ensuring their participation in decision-making to build trust and cooperation among the locals and management of protected areas.
- Increasing Awareness and Compensation Schemes: Government and department needed to conduct more awareness campaigns about wildlife behaviour and legal protections. Offer timely and fair compensation for crop or livestock loss to reduce retaliatory actions and foster tolerance among locals.
- Promoting Alternative Livelihoods: Provide eco-friendly livelihood options like beekeeping, handicrafts, or eco-tourism to reduce reliance on forest resources and encourage communities to support wildlife conservation.
- Habitat Restoration Projects: Restore degraded habitats through afforestation, wetland rejuvenation, and native

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species plantation to reduce pressure on existing wildlife zones and support biodiversity.

- Strict Regulation of Infrastructure Development: Conduct environmental impact assessments (EIAs) before approving infrastructure projects near protected areas, ensuring wildlife migration routes and habitats remain undisturbed.
- Training and Deployment of Rapid Response Teams: Create trained wildlife response teams to handle emergency situations like animal intrusions, helping to safely rescue and relocate wildlife while protecting human lives and property.
- Climate-Resilient Wildlife Management: Develop adaptive strategies to manage the effects of climate change on wildlife, such as water provisioning during dry seasons or protecting climate-vulnerable species and habitats.

VIII. CONCLUSION

Human-wildlife conflict in protected areas like Manas and Kaziranga National Parks poses a significant challenge to tourism, which is a major source of livelihood and regional development. Frequent conflicts—such as crop raiding, property damage, and occasional human injuries or fatalities—create a sense of insecurity, discouraging tourists from visiting these areas. This directly affects local economies that depend heavily on tourism-related activities, including hospitality, transport, and guided tours. Additionally, wildlife-related incidents can damage park infrastructure such as roads, lodges, and fences, leading to increased maintenance costs and further economic losses. While eco-tourism initiatives and community participation programs have been introduced to bridge the gap between conservation and livelihoods, these efforts require consistent support and innovation. Improved monitoring systems, early warning mechanisms, and compensation schemes are helping to reduce tensions but are not yet sufficient to address the scale of the problem. Strengthening local engagement by involving communities in decision-making and benefit-sharing fosters ownership and accountability in conservation efforts. To ensure sustainable coexistence, there is a pressing need for innovative strategies such as wildlife-friendly infrastructure, climate-resilient planning, and integrated land-use management. Long-term success lies in balancing ecological preservation with economic sustainability, especially in these ecologically rich but vulnerable landscapes.

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