SRAS Final Report: Assessing Human-crocodile conflict, people's perception and raising awareness for the conservation of Muggers of Ghodaghodi, Nepal.

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Abstract

Human-wildlife conflict is an escalating conservation challenge worldwide, particularly in developing countries where rural communities depend heavily on natural resources. In Nepal, increasing human population pressure, agricultural expansion, and wetland resource use have intensified interactions between people and wildlife. Although conflicts involving large carnivores have been widely studied, human-crocodile conflict remains comparatively under-documented, especially outside protected areas. The Mugger crocodile (*Crocodylus palustris*) inhabits freshwater ecosystems of Nepal's Terai, including the Ghodaghodi Lake Complex (GGLC), a Ramsar site of high ecological significance. Growing human use of wetlands in this region has increased the potential for human-crocodile interactions. This study assessed the extent, spatial distribution, and seasonal trends of human-crocodile conflict in GGLC, examined local people's perceptions toward Mugger conservation, and evaluated awareness interventions as mitigation tools. A total of 73 households were surveyed using structured questionnaires determined through Cochran's sampling formula. Key informant interviews, focus group discussions, and field observations supplemented quantitative data. In addition, conservation awareness activities, including FM radio broadcasts, educational materials, and community meetings on the Wildlife Damage Relief Guideline 2069, were implemented. Findings indicate that although the frequency of crocodile-related incidents was lower compared to other wildlife conflicts, the perceived risk and psychological fear were high. One confirmed human fatality and several livestock depredation incidents were reported in recent years, with Ward No. 8 identified as the most affected area. Most respondents expressed positive attitudes toward wildlife conservation but emphasized the need for timely compensation, improved safety awareness, and mitigation support. Post-intervention responses demonstrated increased understanding of crocodile ecology, legal protection status, and relief procedures. The study concludes that human-crocodile conflict in GGLC is manageable through participatory education, improved compensation mechanisms, and community engagement. Integrating ecological conservation with social outreach is essential for sustaining Mugger crocodile populations in multiple-use wetlands outside protected areas.

Introduction

Human-wildlife conflict (HWC) has become one of the most pressing challenges in contemporary conservation biology. It is generally defined as any interaction between humans and wildlife that results in negative impacts on human social, economic, or cultural life, or on the conservation of wildlife populations and ecosystems (WWF, 2005; Madden, 2004). As human populations expand and natural habitats shrink or become fragmented, the spatial overlap between human activities and wildlife requirements increases, leading to more frequent and intense conflict situations (Distefano, 2010; Woodroffe et al., 2005). Although conflict between humans and wildlife is not new, its scale and complexity have intensified in recent decades due to rapid population growth, agricultural expansion, infrastructure development, and environmental degradation.

In developing countries, where rural livelihoods are heavily dependent on agriculture, livestock rearing, fisheries, and forest resources, even minor wildlife-induced losses can have significant consequences for household food security and economic stability (FAO, 2009; Mishra, 1997). Crop damage, livestock depredation, property destruction, human injury, and occasionally human death represent direct costs of conflict. In addition to these visible impacts, HWC also generates indirect or "hidden" costs, including psychological stress, fear, reduced mobility, and time spent guarding crops or livestock (Ogra, 2008; Thirgood et al., 2005). Such indirect effects can strongly influence community attitudes toward wildlife and may lead to retaliatory killings or reduced support for conservation initiatives (Dickman, 2010; Mishra et al., 2003).

Nepal is internationally recognised for its conservation achievements, particularly in the recovery of flagship species such as the one-horned rhinoceros and Bengal tiger. The country has established a network of national parks, wildlife reserves, conservation areas, buffer zones, and community forests that represent diverse ecosystems from the lowland Terai to the high Himalayan landscapes (GON, 2014). Despite these successes, human-wildlife conflict remains a critical issue, particularly in areas where wildlife habitats intersect with human settlements. Studies conducted in and around protected areas such as Chitwan National Park, Bardia National Park, and Shuklaphanta Wildlife Reserve have documented significant levels of crop damage, livestock depredation, and human casualties caused by large mammals, including tiger, leopard, rhinoceros, elephant, and bear (Shrestha, 2007; Dhakal, 2020; Gurung et al., 2008). Increasing population pressure and dependence on natural resources in the Terai region have further intensified these interactions.

While much research in Nepal has focused on conflicts involving large carnivores and megaherbivores, comparatively limited attention has been given to reptilian predators, particularly crocodiles. The Mugger crocodile (*Crocodylus palustris*) is a semi-aquatic apex predator distributed across the Indian subcontinent. It inhabits rivers, lakes, marshes, and reservoirs and plays an important ecological role in freshwater ecosystems through trophic regulation and nutrient cycling (Whitaker & Whitaker, 2008; Khadka et al., 2014). The species is currently listed as Vulnerable on the IUCN Red List due to habitat loss, wetland degradation, illegal killing, and increasing human disturbance (Choudhury & de Silva, 2013). In Nepal, Mugger crocodiles occur both within protected areas and in multiple-use wetlands outside formal conservation boundaries.

The Ghodaghodi Lake Complex (GGLC), located in western Nepal, is the largest interconnected natural lake system in the lowland Terai and was designated as a Ramsar site for its high ecological significance and biodiversity (IUCN Nepal, 2004). The complex supports diverse flora and fauna, including threatened mammalian and several reptilian species, among them the Mugger crocodile, which are ecologically important. However, the surrounding communities rely heavily on the wetland and adjacent forests for fishing, livestock watering, fodder collection, and agricultural activities. These livelihood practices increase the likelihood of human-crocodile encounters, particularly along lake margins and riverbanks.

Recent annual reports from the Department of National Parks and Wildlife Conservation (DNPWC) indicate increasing incidents of wildlife-related injury, livestock depredation, and human fatalities across Nepal, including cases involving Mugger crocodiles (DNPWC, 2019). Although the Wildlife Damage Relief Guideline 2069 (5th amendment) provides compensation for damages caused by 14 listed wildlife species, including the Mugger crocodile, awareness and accessibility of relief mechanisms remain limited in many rural areas. Furthermore, Ramsar sites and wetlands outside protected areas often receive less management attention compared to national parks, despite hosting important wildlife populations.

Understanding local perception is critical because conservation success ultimately depends on community support and willingness to coexist with wildlife (Graham et al., 2005; Treves, 2007). Negative experiences or fear of potential attacks can shape attitudes toward crocodiles and may influence compliance with conservation regulations. Conversely, awareness programs and participatory engagement can enhance tolerance and promote sustainable coexistence.

Despite the ecological importance of Mugger crocodiles and the increasing human use of wetlands in GGLC, there has been a limited systematic assessment of human-crocodile conflict and community perception in this region. Most previous studies in the area have focused broadly on human-wildlife conflict or biodiversity assessment rather than species-specific interactions. Therefore, this study aimed to fill this knowledge gap by assessing the extent, spatial distribution, and seasonal patterns of human-crocodile conflict in GGLC, examining local people's perception toward Mugger crocodile conservation, and evaluating awareness interventions as tools for conflict mitigation. By integrating ecological and social dimensions, the study contributes to the development of evidence-based management strategies for conserving Mugger crocodiles in multiple-use wetland landscapes outside protected areas.

Methods and Materials

Study Area

The study was conducted in and around the GGLC, located in Kailali District of western Nepal (Figure 1). GGLC is the largest interconnected natural lake system in the lowland Terai and covers approximately 2,563 hectares. It was designated as a Ramsar site in 2003 due to its ecological significance, biodiversity richness, and role as an important wetland habitat (IUCN Nepal, 2004). The complex comprises freshwater lakes, marshes, seasonal ponds, surrounding forests, and agricultural lands. The region experiences a tropical monsoon climate characterized by hot summers, heavy rainfall during June-September, and mild winters. The surrounding communities primarily depend on agriculture, livestock rearing, fishing, and forest resource extraction. Human activities such as livestock watering, fishing, bathing, washing, and fodder collection frequently occur along lake edges and riverbanks, increasing the potential for human-crocodile encounters. Mugger crocodiles (*Crocodylus palustris*) inhabit the lakes and associated wetlands of the complex. Three wards of Ghodaghodi Municipality (Ward No. 1, Ward No. 4, and Ward No. 8; Figure 1) were purposively selected for the study based on proximity to water bodies, reported wildlife incidents, and accessibility.

Research Design

The study adopted a mixed-methods approach combining quantitative and qualitative data collection techniques. This design allowed for assessment of both measurable conflict patterns and community perceptions, which are essential components in understanding human-wildlife conflict dynamics (Dickman, 2010; Treves, 2007).

Sampling Design

The target population consisted of households residing in selected wards adjacent to the lake complex. Sample size was determined using Cochran's (1977) formula for estimating proportions in large populations. Based on calculated parameters and population distribution, 73 households were selected. The sample was proportionally allocated across the three wards according to the number of households in each ward. Households were selected using systematic random sampling within each ward. Adult

household members, preferably household heads or individuals directly involved in agriculture or livestock management, were interviewed.

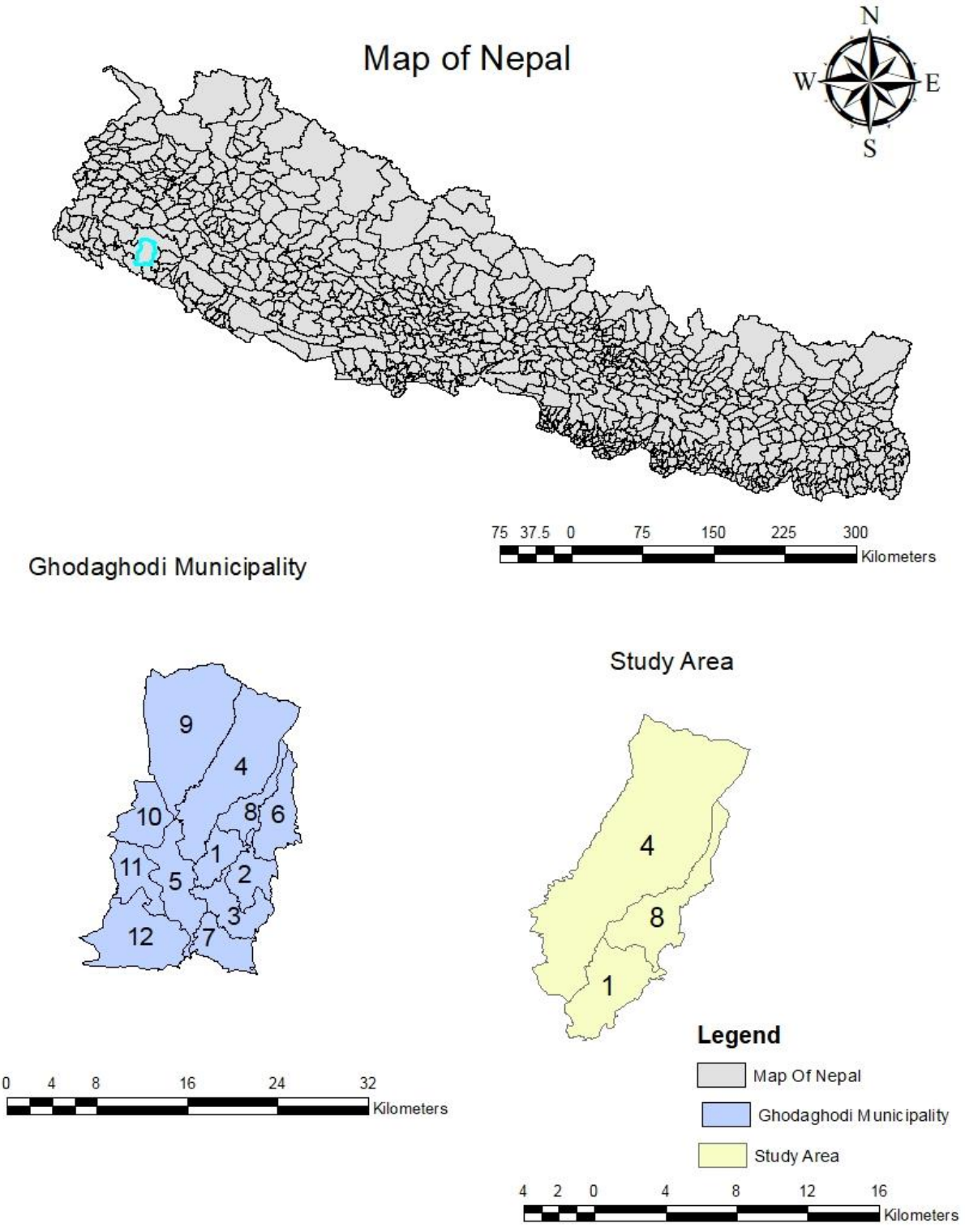


Figure 1. Study Area map

Data Collection Methods

Households were surveyed using a pre-tested semi-structured questionnaire (closed and open-ended) to collect data on demographics, livestock use, crocodile encounters, injuries, livestock loss, seasonal trends, conflict causes, attitudes, and awareness of relief guidelines. Data were collected post-monsoon (Oct–Dec).

Key Informant Interviews with forest officials, tourism board members, conservation workers, community leaders, and elders explored conflict trends, crocodile populations, relief systems, and challenges were also conducted**.**

Focus Group Discussions (FGDs) (8 to 12 participants per ward) validated survey data and discussed shared experiences, seasonal patterns, and mitigation strategies.

Field Observation at lakes and riverbanks recorded crocodile signs, livestock areas, and human activity to identify conflict hotspots.

Secondary Data from government reports, municipal records, literature, and biodiversity studies were used for comparison and context.

Awareness Activities

Awareness programs included radio broadcasts, brochures, school competitions, and community sessions on safety and relief guidelines. Participation and feedback were recorded.

Data Analysis

Quantitative data from household surveys were coded and analysed using Microsoft Excel and SPSS. Descriptive statistics such as frequencies, percentages, and averages were used to assess livestock depredation rates per household, ward-wise distribution of incidents, and perception patterns. Qualitative data from interviews and focus group discussions were analysed using thematic analysis, identifying key themes including fear, compensation challenges, habitat change, and conservation support. Triangulation was applied by comparing findings from surveys, interviews, FGDs, and secondary sources to improve reliability and validity (Creswell,2014).

Ethical Considerations

Informed verbal consent was obtained from all participants prior to interviews. Respondents were informed about the purpose of the study and assured that information would be used solely for research purposes. Sensitive questions regarding compensation or illegal activities were approached cautiously to avoid discomfort. No personal identifiers were included in the final dataset.

Results

Socio-Demographic Characteristics of Respondents

A total of 73 households participated in the survey across Ward No. 1, Ward No. 4, and Ward No. 8 of Ghodaghodi Municipality. Most respondents were male household heads, although women actively contributed information related to livestock management and wetland resource use. The age of respondents ranged from 24 to 72 years, with most participants falling within the economically active age group (30-55 years). Agriculture was the primary source of livelihood for most households, followed by livestock rearing and small-scale business activities. Average household size was moderate,

and most families reported long-term residence in the area, indicating strong familiarity with local environmental conditions and wildlife presence. Livestock ownership was common among surveyed households, with goats, cows, buffaloes, pigs, and sheep being the predominant animals kept for subsistence and income generation. The dependence on wetland resources was high. Many respondents regularly accessed lake margins for fishing, washing, bathing, irrigation, and livestock watering. Such daily interactions increased the probability of human-crocodile encounters.

Extent and Nature of Human-Crocodile Conflict

Although multiple wildlife species were reported to cause damage in the study area, Mugger crocodile incidents were primarily associated with water-based interactions. Respondents reported that crocodile encounters most frequently occurred near lake edges, riverbanks, and livestock watering points. Within the reference period considered in the study, one confirmed human fatality attributed to crocodile attack was reported in the broader area. In addition to human casualty, several livestock depredation incidents were recorded. Livestock losses were most reported when animals were taken to water sources without supervision or during early morning and evening hours. The overall average livestock depredation rate due to wildlife was calculated at 0.210 animals per household per year. Although crocodiles were not responsible for most depredation cases compared to large carnivores such as leopard, their attacks were perceived as more dangerous due to the risk of human injury or death. Ward-wise analysis indicated that Ward No. 8 experienced the highest frequency of reported wildlife encounters and livestock loss. This ward is geographically closer to major water bodies and has higher dependency on wetland resources. Ward No. 1 reported the lowest depredation rate, likely due to relatively greater distance from core lake areas.

Spatial Distribution of Conflict

Field observations and household responses identified key conflict hotspots, including frequently used livestock watering sites, shallow fishing areas, dense vegetation along lake margins, and seasonal floodplains. Respondents reported more crocodile sightings in areas with minimal human disturbance and during high water levels, with proximity to basking and nesting sites increasing encounter frequency. Spatial variation was observed across wards, with Ward No. 8 experiencing the highest livestock depredation and sightings, Ward No. 4 showing moderate interaction, and Ward No. 1 reporting fewer incidents.

Seasonal Trends

Seasonal patterns were identified through respondent recall and key informant interviews. Crocodile encounters were reported more frequently during the monsoon and post-monsoon seasons (June to November). Increased water levels during monsoon expand crocodile movement range and bring them closer to agricultural and grazing areas. Additionally, monsoon flooding reduces availability of dry basking sites, potentially increasing crocodile presence near accessible banks used by people. Fishing activity also increases during this period, intensifying human-crocodile interface. Dry season encounters were comparatively lower, although crocodiles were occasionally sighted basking near exposed banks.

Types of Damage and Impacts

The study categorized impacts into direct and indirect effects.

Direct impacts included one confirmed human fatality in recent years, livestock depredation, and loss of goats and other small animals near water bodies. Goats were the most vulnerable due to their small size and frequent presence near water, while larger livestock such as buffalo were less commonly

affected. Although crocodile-related incidents were fewer than carnivore attacks, they caused significant economic and emotional impacts on affected households.

Indirect impacts were substantial. Many respondents expressed fear of approaching water bodies, especially during early morning or late evening. Women and children were often discouraged from accessing lakes alone. Some households reported spending additional time guarding livestock or altering grazing routes to avoid high-risk areas. Psychological fear was reported even among households that had not experienced direct attacks. This suggests that perceived risk plays a significant role in shaping attitudes toward crocodiles.

Perception Toward Mugger Crocodile Conservation

Most (78%) respondents expressed positive attitudes toward wildlife conservation despite conflict concerns, recognising the ecological role of crocodiles in maintaining wetland balance. However, this support depended on effective management and fair compensation. Reactions to wildlife damage varied, with some showing tolerance, others expressing frustration due to economic loss, and a minority holding negative views, especially among directly affected households. Most did not support killing crocodiles and instead suggested preventive measures such as fencing, awareness programs, and safer livestock practices. Households with prior exposure to conservation programs or interaction with forest officials showed more positive attitudes than those without such exposure.

Knowledge of Wildlife Damage Relief Mechanism

Awareness of the Wildlife Damage Relief Guideline 2069 was low before the intervention, with many respondents lacking knowledge of eligibility criteria, documentation, and compensation limits. Following community meetings and awareness sessions, participants showed improved understanding of compensation for human injury or death, livestock loss procedures, required documents, and reporting contacts. However, key informants noted that complex procedures and delays often discouraged households from applying for relief.

Effectiveness of Awareness and Outreach Programs

The project implemented awareness activities such as FM radio broadcasts, brochure distribution, school competitions, and community meetings. Participation was high, especially in schools, where teachers noted increased student interest in wetland conservation. Community meetings encouraged dialogue between residents and local authorities. Post-intervention findings showed better understanding of crocodile ecology, fewer misconceptions about their behaviour, greater willingness to adopt preventive practices, and increased awareness of water safety. However, while short-term attitude improvements were evident, sustained behavioural change requires ongoing engagement.

Identified Causes of Conflict

Respondents and key informants identified key causes of human–crocodile conflict, including increased human use of wetlands, habitat disturbance and vegetation clearing, livestock grazing near water edges, limited awareness of crocodile behaviour, and seasonal flooding that expands crocodile range. Habitat fragmentation and rising human pressure were commonly highlighted as major contributing factors.

Community-Suggested Mitigation Measures

Participants suggested mitigation strategies such as safe water access points, warning signs in high-risk areas, fencing, predator-proof livestock enclosures, better compensation systems, and continued conservation education. There was strong agreement that coexistence is achievable with proper management support. Overall, human–crocodile conflict in GGLC is moderate in frequency but

significant in perception and psychological impact. Conflict is influenced by proximity to water access points, seasonal variation, and community dependence on wetland resources. Although most residents' support conservation, ongoing engagement and improved mitigation measures are essential to sustain tolerance and prevent escalation.

Discussion

The findings of this study provide important insights into the dynamics of human-crocodile conflict in the GGLC and highlight the social and ecological dimensions shaping coexistence between local communities and Mugger crocodiles (*Crocodylus palustris*). Although the recorded frequency of crocodile-related incidents was relatively lower compared to conflicts involving large carnivores in Nepal, the perceived severity and psychological impact were substantial. This pattern aligns with broader human-wildlife conflict literature indicating that fear and perceived risk often influence community attitudes more strongly than actual loss magnitude (Dickman, 2010; Treves, 2007).

The study documented one confirmed human fatality and several livestock depredation cases attributed to crocodiles in recent years. While numerically limited, such incidents carry high emotional and social weight. Human fatalities, even when rare, significantly shape local perception and can reduce tolerance toward protected species (Thirgood et al., 2005). In many developing contexts, the psychological cost of living alongside potentially dangerous wildlife is often underestimated (Ogra, 2008). The average livestock depredation rate observed in this study was moderate, and crocodiles were not the primary cause of overall livestock loss compared to terrestrial carnivores. However, crocodile attacks occur in shared resource zones, particularly water access points, making them unpredictable and highly visible events. Similar findings have been reported in crocodile-inhabited wetlands in South Asia, where conflict tends to concentrate around fishing areas, livestock watering sites, and riverbanks (Whitaker & Whitaker, 2008). The concentration of incidents in Ward No. 8 highlights the role of spatial proximity to core wetland areas and dependence on aquatic resources. Communities that rely heavily on lake margins for daily activities are inherently exposed to greater interaction risk. This observation is consistent with ecological theory suggesting that increased edge effects and habitat overlap elevate conflict probability (Woodroffe & Ginsberg, 1998; Sukumar, 1990).

A seasonal trend was identified in this study with higher encounters during monsoon and post-monsoon periods, reflecting ecological dynamics of crocodile behavior. Increased water levels during the monsoon expand available habitat and allow crocodiles to move into floodplain areas, bringing them closer to agricultural and grazing zones. Concurrently, fishing activity intensifies during this season, increasing human presence near water. Such seasonal peaks are common in human-wildlife conflict systems globally, where wildlife movement patterns intersect with human livelihood cycles (Distefano, 2010). Understanding these temporal patterns is critical for designing targeted mitigation strategies, such as heightened awareness campaigns during high-risk months.

One of the most encouraging findings of this study is that most respondents expressed support for wildlife conservation despite experiencing or perceiving conflict. This suggests that tolerance levels remain relatively strong within the community. Similar patterns have been observed in Nepal's participatory conservation areas, where long-term engagement and community forestry initiatives have fostered positive attitudes toward wildlife (GON, 2014; Shrestha, 2007). However, tolerance appears conditional upon effective management and fair compensation. Households directly affected by depredation or aware of human fatality cases expressed greater frustration. This aligns with Mishra et al. (2003), who argued that perceived injustice or delayed compensation can erode conservation support

and trigger retaliatory responses. Importantly, very few respondents advocated for killing crocodiles as a solution. Instead, community-suggested mitigation measures focused on practical risk reduction strategies, such as designated water access points and fencing. This demonstrates willingness for coexistence, provided safety and economic concerns are addressed.

Prior to our intervention, awareness of the Wildlife Damage Relief Guideline 2069 was limited. This lack of knowledge likely contributes to frustration among affected households. Studies across South Asia have shown that inadequate understanding of compensation procedures can exacerbate conflict perception (FAO, 2009; Treves, 2007). The awareness interventions implemented under this project, including FM radio programs, educational materials, and community meetings, resulted in improved knowledge about crocodile ecology, legal protection status, and relief processes. Education-based interventions are widely recognized as essential tools in human-wildlife conflict mitigation (Graham et al., 2005). While short-term improvements in awareness were observed, sustained behavioral change requires long-term engagement. School-based programs were particularly effective in generating interest among youth. Integrating conservation education into local curricula may support intergenerational tolerance and long-term conservation outcomes.

Mugger crocodiles function as apex predators within freshwater ecosystems. They regulate prey populations, contribute to nutrient cycling, and maintain ecological balance (Whitaker & Whitaker, 2008). Removal or persecution of such keystone species can lead to trophic imbalance and ecosystem degradation (Terborgh, 1992). In Ramsar sites like GGLC, maintaining crocodile populations contributes not only to biodiversity conservation but also to international wetland protection commitments. Therefore, addressing human-crocodile conflict is not solely a local social issue but also a matter of global conservation significance.

The findings of this study highlight several management implications:

1. **Risk Zonation:** Mapping and marking high-risk water access points could reduce accidental encounters.
2. **Designated Safe Access:** Construction of fenced or reinforced livestock watering areas may minimize exposure.
3. **Compensation Efficiency:** Simplifying documentation and ensuring timely relief distribution can sustain tolerance.
4. **Continued Education:** Regular awareness programs during high-risk seasons are recommended.
5. **Community Participation:** Involving residents in monitoring and reporting crocodile sightings enhances ownership.

Integrated conservation approaches that combine ecological monitoring with social outreach are necessary for sustaining coexistence in multiple-use wetlands outside protected areas.

This study relied partly on respondent recall for livestock depredation and encounter frequency, which may introduce recall bias. Additionally, direct population assessment of crocodiles was beyond the scope of this project. Future research integrating ecological population surveys with socio-economic assessment would provide more comprehensive insights. Overall, the discussion demonstrates that human-crocodile conflict in GGLC is not severe in numerical terms but carries significant perceptual and psychological dimensions. Community tolerance remains relatively strong, and awareness interventions show promise. Sustained participatory engagement, improved compensation systems, and

targeted mitigation measures are essential to ensure long-term conservation of Mugger crocodiles in Ramsar wetlands outside protected areas.

While this study provides important baseline information on human-crocodile conflict and community perception in the GGLC, several areas require further investigation and long-term monitoring. First, systematic ecological assessment of Mugger crocodile population size, nesting sites, and seasonal movement patterns should be conducted. Integrating ecological surveys with conflict data would allow identification of high-risk zones and critical habitats requiring targeted management. Second, spatial mapping using Geographic Information Systems (GIS) could be employed to develop a detailed conflict hotspot map. Such mapping would support risk zonation, infrastructure planning, and the design of safer community access points to wetlands. Combining ecological data with socio-economic variables would strengthen predictive capacity for future conflict scenarios. Third, long-term evaluation of compensation mechanisms under the Wildlife Damage Relief Guideline 2069 is recommended. Assessing processing time, transparency, and community satisfaction with relief delivery would help identify administrative gaps and improve institutional response. Comparative studies between protected areas and Ramsar wetlands outside protected zones would also be valuable. Fourth, continued conservation education programs should be institutionalized, particularly within schools and community groups. Monitoring changes in perception over time would help determine whether awareness interventions result in sustained behavioral change. Youth-focused environmental education may play a critical role in fostering long-term tolerance. Finally, participatory community-based wetland management initiatives should be explored. Involving residents in crocodile monitoring, reporting systems, and habitat conservation may strengthen stewardship and reduce conflict escalation. Future research integrating ecological, social, and institutional dimensions will be essential to ensure adaptive management and long-term conservation of Mugger crocodiles in multiple-use wetland landscapes.

One of the most interesting findings of this study was the contrast between the relatively low numerical frequency of crocodile-related incidents and the high level of perceived fear among community members. Although crocodiles were not the primary cause of overall livestock depredation compared to terrestrial carnivores, they were viewed as more dangerous due to the potential for human fatality. This indicates that perception of risk is shaped more by severity of possible outcomes than by frequency of incidents.

Another notable finding was the generally positive attitude toward wildlife conservation despite the presence of conflict. Even households that had experienced livestock loss expressed support for conservation if proper compensation and safety measures were ensured. Very few respondents suggested retaliatory killing as a solution, which reflects a relatively high level of tolerance and conservation awareness within the community.

Additionally, school-based awareness programs generated strong engagement among students, suggesting that youth-focused conservation education may be particularly effective in shaping long-term attitudes. The willingness of community members to propose practical mitigation strategies, such as designated safe water access points, further highlights the potential for participatory coexistence approaches.

Conclusion

This study assessed the extent of human-crocodile conflict, local perceptions, and the role of awareness interventions in the GGLC, a Ramsar-designated wetland in western Nepal. The findings indicate that

although the overall frequency of Mugger crocodile incidents is moderate compared to conflicts involving large terrestrial carnivores, the perceived severity and psychological fear associated with crocodile encounters are substantial. One confirmed human fatality and several livestock depredation cases have significantly influenced community perception, particularly in areas located close to core wetland zones. Spatial analysis revealed that conflict incidents are concentrated near frequently used water access points and are more common during monsoon and post-monsoon seasons when crocodile movement and human activity intensify. Ward No. 8 was identified as the most affected area due to its proximity to lake margins and higher dependency on wetland resources. Despite these challenges, most respondents expressed support for wildlife conservation and did not advocate for retaliatory killing of crocodiles, indicating a relatively high level of tolerance within the community. Awareness interventions implemented during the study improved knowledge about crocodile ecology, legal protection status, and compensation procedures under the Wildlife Damage Relief Guideline 2069. However, long-term coexistence will depend on sustained community engagement, timely and transparent compensation mechanisms, and practical mitigation measures such as designated safe water access points and livestock management improvements.

Overall, the study concludes that human-crocodile conflict in GGLC is manageable through integrated ecological and social approaches, and that participatory conservation strategies are essential for ensuring the long-term survival of Mugger crocodiles in multiple-use wetland landscapes outside protected areas.

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PHOTOGRAPHS



Figure 2 During Household questionnaire survey



Figure 3 During Household questionnaire survey



Figure 4 During Household questionnaire survey



Figure 5 KII with GACPF



Figure 6 Monkeys raiding wheat crop



Figure 7 Watch tower