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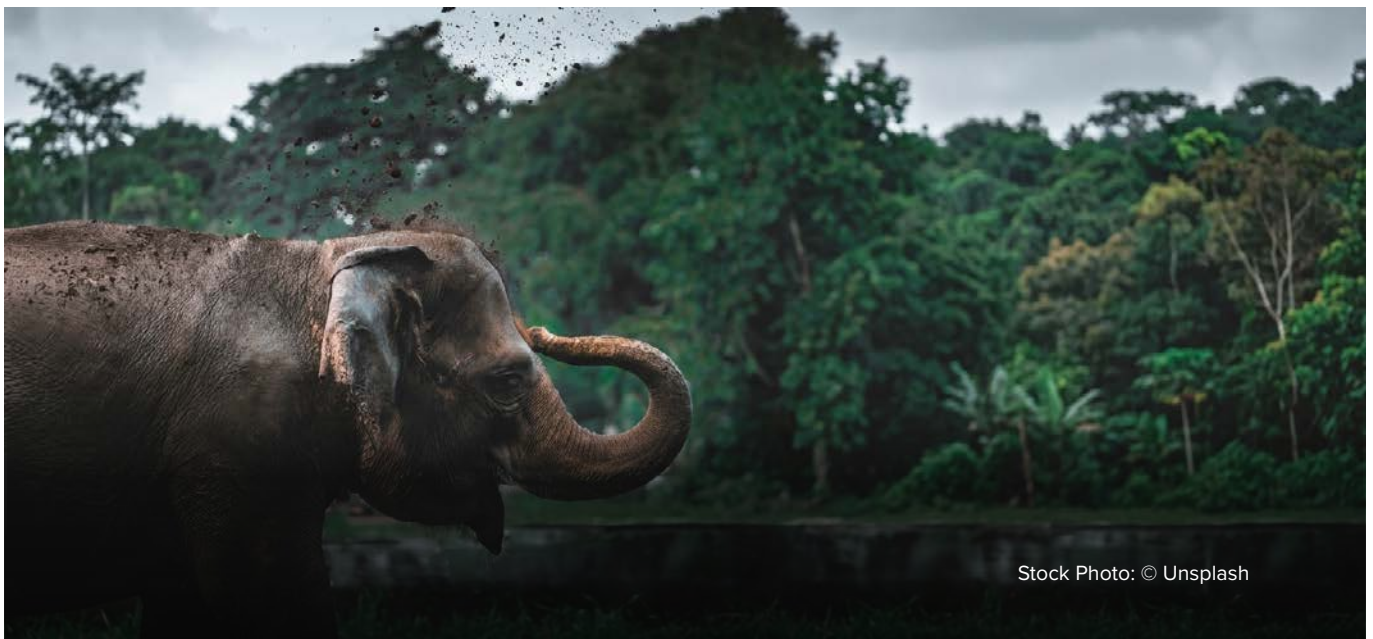
Busy as a Bee: **Mitigating human Elephant Conflict in Cox's Bazar, Bangladesh**

Pilot Independent Impact Study Summary

1. Background

Human–elephant conflict (HEC) in Teknaf, Cox’s Bazar, Bangladesh, represents a complex socio-ecological challenge driven by rapid environmental change and population pressures. Habitat fragmentation, deforestation, and land conversion have disrupted elephant migration routes and reduced access to natural food sources. These challenges have been significantly exacerbated by the large-scale movement of Rohingya refugees into the area since 2017, which increased settlement density and demand for land and resources. As a result, elephants have increasingly entered agricultural and refugee camp areas, leading to crop loss, property damage, injuries, and loss of life for both refugee and host communities. These incursions have also had a detrimental impact on elephant populations, with many elephants being killed.

To address this, UNHCR, the UN Refugee Agency, in Bangladesh, in collaboration with the [International Union for Conservation of Nature \(IUCN\)](#), the [Center for Natural Resource Studies \(CNRS\)](#), and other partners, implemented a pilot to test possible nature-based solutions with the support of UNHCR’s Environment and Climate Action Innovation Fund. The project aimed not only to mitigate HEC, but also to improve livelihoods, reduce dependency on forest resources, and address mounting social tensions. Community learning exchanges and participatory approaches ensured that knowledge was shared widely, retained locally, and considered existing practices.

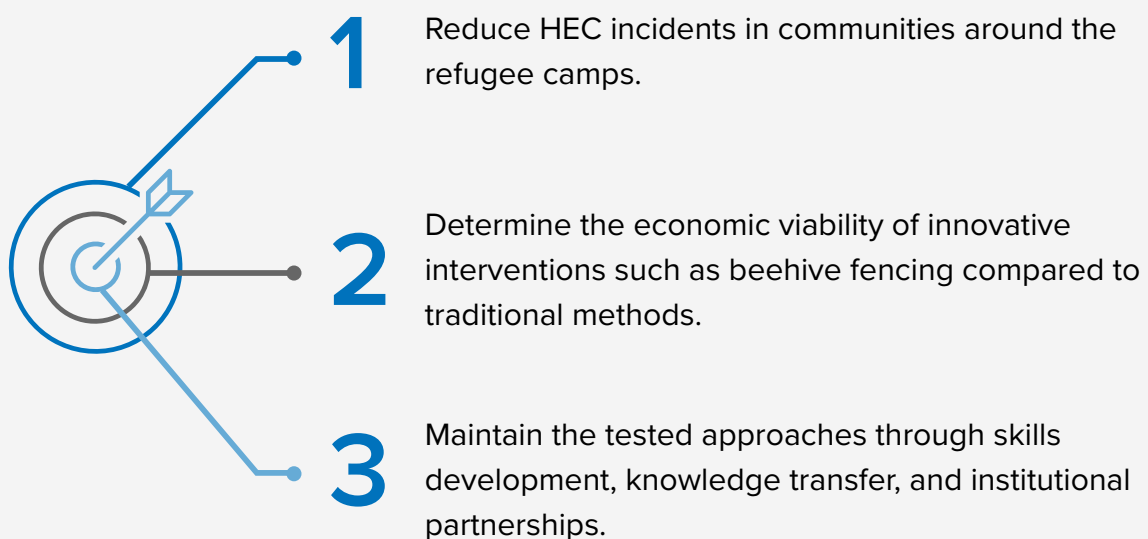


2. Project Objectives

The project had three interlinked objectives. First, it aimed to reduce HEC incidents in communities around the refugee camps and promote safer coexistence between humans and wildlife through community-led approaches. Second, it looked to determine the economic viability of innovative interventions such as beehive fencing and cultivation of Elephant Non-Preferred Crops (ENPC) compared to traditional crops. Third, it sought to maintain the tested approaches through skills development, knowledge transfer, and institutional partnerships. Gender equality and inclusion were central objectives, ensuring women and vulnerable groups could actively participate and contribute to decisions.

The project examined changes in agricultural practices and cropping patterns, particularly the shift towards ENPC to generate needed evidence for application. Through the testing of different strategies, regular inputs and recommendations from communities, and measuring of impact, the project also aimed to identify sustainable solutions that could be replicated in other HEC-prone contexts.

3 Project Objectives



3. Key Strategies

The intervention was built around two complementary nature-based strategies:



Beehive fencing: This used elephants' natural aversion to bees to deter them from entering farms. This approach is non-lethal, environmentally friendly, and has been successfully applied in other countries. When elephants approach, the disturbance of hives triggers buzzing bees, causing elephants to retreat. Farms with installed beehives reported that the frequency of elephant raids decreased by 70%, which led to significant reduction in crop damage.



Cultivation of ENPC: This strategy looked to introduce crops that are less attractive to elephants such as chili, turmeric, bitter gourd, and radish, to create a buffer around farms. The crops were selected based on ecological suitability, resistance to elephant damage, and market demand. As a result, many families reported a noticeable increase in cash earnings due to fewer crop losses, which helped meet household needs and reduced dependence on subsistence farming alone.

Both strategies were supported by training, technical assistance, and community engagement, creating a model that combines conservation with livelihood improvement.

4. Key Findings

The findings demonstrate clear positive impacts across multiple dimensions.

- **Impact of HEC reduction:** Approximately 70% of households with beehive fencing reported fewer elephant raids, while 57% of ENPC farmers experienced reduced conflict. Beehive fencing was particularly effective at altering elephant movement patterns, while ENPC reduced economic losses by minimizing crop vulnerability.
- **Livelihood and economic outcomes:** Around 80–85% of participants reported increased income. Honey production provided a 15 to 20% income increase, while ENPC cultivation generated seasonal earnings of BDT 30,000 to 40,000 per harvest (240–325 USD). These interventions also improved resilience by diversifying income sources and agricultural outputs.
- **Social and community impacts:** The project fostered interaction between host and refugee communities, particularly through shared implementation activities. However, these relationships remained largely transactional, without significant long-term trust-building. To improve this in future programming, activities could shift toward a “Co-Management Plus” model, working more closely with local community-based organizations (CBOs) and refugee leaders and groups as primary mediators, where feasible. Future interventions could look to design joint decision-making forums where host and refugee representatives co-design HEC mitigation strategies and resource-sharing protocols.
- **Gender and inclusion insights:** Women actively participated in both beekeeping and ENPC cultivation. The pilot helped improve their income stability by providing alternative livelihood opportunities and diversifying income sources. However, gaps remained, particularly in the inclusion of people with disabilities and structured support for elderly participants

70%

Fewer elephant
raids for households
with bee fencing

57%

Fewer elephant
raids for households
with ENPC

15-20%

Increased household income
from honey production

5. Key Constraints

Several constraints limited the effectiveness and scalability of the intervention:



Technical challenges: Farmers faced challenges accessing inputs such as seeds, fertilizers, and tools. There were also knowledge gaps in beehive management and resistance to adopting new practices due to risk aversion and low awareness.



Environmental challenges: Water scarcity and salinity posed critical challenges, reducing crop productivity and affecting long-term sustainability. Many communities depend on saline river water, which limits agricultural potential.



Social and institutional challenges: There were trust gaps between communities and the Bangladesh Forest Department (which was responsible for ensuring that project activities aligned with the Government's conservation policies and regulations), as well as limited social cohesion between ethnic groups and refugee populations. Security concerns near refugee camps further restricted participation and investment in livelihood activities.

6. Recommendations

To strengthen impact and sustainability, the below recommendations can be considered:

- **Programmatic:** Future interventions should adopt an integrated water–energy–livelihood approach, including rainwater harvesting and improved irrigation systems. Post-training support should be strengthened through Master Farmer networks and institutional certification.
- **Inclusion efforts:** Inclusion should be enhanced by designing adaptive tools and ensuring participation of marginalized groups, particularly people with disabilities. Community and institutional engagement should be reinforced by establishing cooperatives, improving dialogue with the Forest Department, and strengthening grievance mechanisms.
- **Scaling:** The project should develop a standardized HEC-resilient package combining ENPC seeds, beehive fencing designs, and water-saving techniques. Innovative financing models and integration with early warning systems should also be explored.

7. Future Directions

- **Community ownership and participation:** Future programming should facilitate dialogue and joint activities between communities. Where possible, mixed-group activities involving different ethnic groups can help build trust and strengthen cohesion.
- **Technical support and capacity building:** Ensuring continuous knowledge sharing beyond the project lifecycle through accessible training materials (e.g., simplified visual manuals, maintenance guides for beehive fences, and ENPC cultivation handbooks) and partnerships with local institutional hubs.
- **Market access and value chains:** Strengthen market access by investing in local value-addition enterprises and building partnerships with private sector actors. Exploring additional bee-related products beyond honey, such as beeswax and other value-added products, could further diversify livelihood opportunities and increase household earnings. This will help farmers move beyond subsistence production and connect to higher-value markets, including urban centers, tourism markets in Cox's Bazar, and potential export opportunities.
- **Institutional coordination of local networks:** Deepen collaboration with local CBOs and refugee-led organizations (RLOs) to ensure locally driven solutions. Partnering with these entities as core implementation leads can support a deeper, more nuanced understanding of the local context and enable more effective, locally-led approaches to addressing social cohesion challenges on the ground.
- **Opportunities for expansion and policy integration:** Policy integration is critical, with efforts needed to embed nature-based HEC mitigation approaches into national frameworks and secure funding for scale-up. Involvement of other stakeholders, including private sector actors, could improve sustainability and scale of the approach.
- **Multi-stakeholder partnerships and resource mobilization:** Future initiatives could benefit from partnerships with stakeholders that bring complementary expertise and resources. Government agencies, research institutions, private sector actors, environmental organizations, and development partners could provide technical assistance, market linkages, capacity building, and funding support to help sustain and scale successful approaches such as beekeeping enterprises and HEC mitigation measures.

Conclusion

The pilot demonstrates that combining beehive fencing and ENPC provides an effective, nature-based solution to HEC while improving livelihoods. These interventions are financially viable, environmentally sustainable, and socially beneficial. However, long-term success will depend on addressing key constraints, strengthening partnerships, and ensuring inclusive, community-driven implementation.



Acknowledgement

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