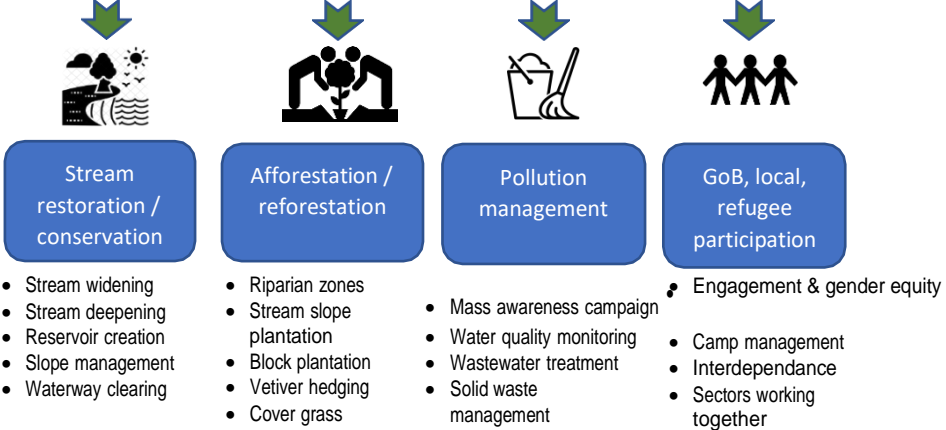


# Madhur Chhara Ecological Watershed

Assessment of the socio-ecological impact of a degraded Madhur Chhara watershed and solution package

## Nature-based Solutions (NbS) initiative



## Meeting Local Challenges adhering to SDGs



**Ecosystem preservation and human well-being as equal priorities**

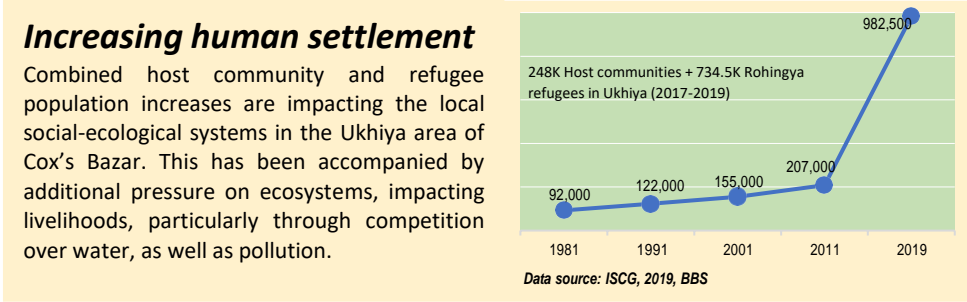
Biodiversity - Food and water security - Aesthetics - Disaster risk reduction - Climate Change mitigation  
- Groundwater recharge - Local capacity



## Protecting the Madhur Chhara in Cox's Bazar Transforming into Wetlands and Green Spaces

**Madhur Chhara: A Natural Lifeline in Ukhiya**

Madhur Chhara, a 7.8 km long hill stream, was gradually affected by the largescale settlement of refugees in the Kutupalong area after August 2017. UNHCR is now engaged in preserving and improving this important natural contributor to a positive ecosystem in the area, recognizing the importance of the Madhur Chhara in supporting refugee and host community water security, food security, livelihoods, and regional biodiversity. UNHCR is committed to working with Bangladesh to take quick measures to restore the Madhur Chhara before it faces any irreversible consequences.



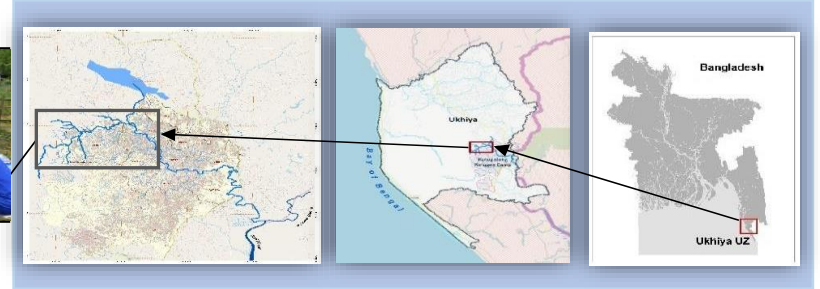
**Conservation in a humanitarian setting**

It is essential that the Government, UN, NGOs, refugees and host community continue to contribute to protecting and conserving valuable ecosystems. In Ukhiya, many livelihoods also depend on a healthy ecosystem. Recognising the importance of this work, UNHCR and partner CNRS are piloting a package of nature-based solutions (NbS) to restore streams in and around the large Kutupalong refugee settlement, starting with work on *Kalam Chhara*, a sub-stream of *Madhur Chhara* since January 2019. The UNHCR-CNRS team are also planning to scale up NbS approaches for other degraded stream locations in the area, thereby helping to improve the overall environment for both refugees and host communities. UNHCR-CNRS's joint efforts to restore the degraded Madhur Chhara hill stream is pioneering much-needed work to further facilitate and develop a greener future that equally prioritises nature and people.

**NbS Interventions Piloted on the Kalam Chhara Chhara stream since January 2019**

- Rehabilitating degraded *chhara* reaches (deepening and widening)
- Reducing soil erosion by making green covers
- Creating water reservoirs for social-ecological resilience including facilitating ground water recharge
- Piloting biological-mechanical (green and grey) wastewater treatment plants
- Re-greening Stream banks -Riparian and block plantation with vetiver/grass hedging using local species
- Demonstrating and sensitizing communities around solid waste management
- Demonstrating conservation agriculture practices in stream basins
- Engaging Communities and local stakeholders in management of stream and regeletion both within and outside camps

**1. Riparian plantation restoration**



**2. *Cana indica* planted in stream bed to absorb pollutants**



**3. Stream slope protection – green technology**



**4 & 5. Bio-mechanical wastewater treatment plant & water reservoir re-excavation**



**6. Kalam Chhara Walkway Trail**



**11. Sedimentation Management (Silt Trap)**



**14. Hill Slope Protection**

**12. Eco-friendly Space (Eco-shed)**



**15. Water reservoir 3**

**13. Plant, Bamboo and Grass Nursery**



**16. Hill Slope Plantation**

**7. Reservoir Creation**



**8. Vetiver/grass hedging and bank plantation**



**9. Stream Rehabilitation (Kalam Chhara)**



**10. Slope Protection**

