Project Brief

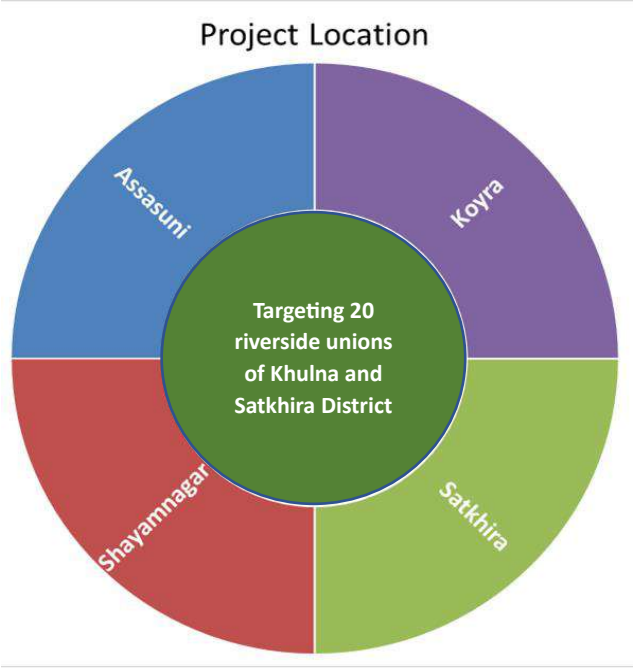
"Spatial Surge Forecasting Using Artificial Intelligence and Community Knowledge for Inclusive and Transformative Early Actions (SURF-IT)"

PROBLEM STATEMENT: Bangladesh has made remarkable progresses in disaster management, particularly cyclones, saving lives through coastal infrastructure and policy shifts. However, the focus on cyclones often neglects the devastating impact of regular tidal surges on vulnerable communities, especially women suffer disproportionately due to inadequate preparation and response.

OVERALL OBJECTIVE: To develop impact-based forecasting models using AI that support risk-informed and gender transformative and inclusive early actions against tidal surge/cyclone in selected Southwest Coastal Bangladesh

Specific Objective 1: To develop, pilot and promote impact based localized forecasting using AI for risk informed early actions against tidal surge with appropriate communication tools.

Specific Objective 2: Design, pilot and endorse Women-Centered Early Action Protocols along with developing capacities of stakeholders so that gender transformative and inclusive risk informed early actions can be taken against tidal surge.



PROJECT PERIOD: 3 years

Target People: 100% people in 20 Unions specially focusing on women, Piloting in 3 Unions and 450 HH

What Changes will this Project Bring?

Current Scenario	What Change will happen
Limited Spatial or localized forecast and trigger mechanism	Specialized forecast and Trigger Mechanisms will be developed
Lack of AI utilization in forecasting tools within Bangladesh.	Will develop a forecasting tool with AI and machine learning which can be replicated across other areas and disaster in Bangladesh strengthening our effort to ensure high-quality disaster management
No publicly available updated Embankment maps for the project area	Updated embankment maps
Cyclone-related EAP is not gender-focused	Gender-transformative EAP will be developed
Generic forecast for all user groups	Different forecast for different users groups based on users requirements
High loss and damage to productive assets due to high tide and tidal surge	Reduced loss and damage for high tide and tidal surge. We will also be able to predict anticipated loss and damage beforehand and take/prioritize actions

'SURF-IT' project is funded by UK aid from the UK government and by the International Development Research Centre, Ottawa, Canada as part of Climate Adaptation and Resilience (CLARE) research programme. Learn more about CLARE on https://clareprogramme.org/

INNOVATIVE ELEMENTS

AI-Driven Tidal Surge Forecasting	Embankment Mapping and Loss and Damage Calculation	Women-Centered Early Action Protocol
Develop a sophisticated AI model for precise, impact-based surge predictions in specific locations, empowering communities to take informed actions.	Utilize drones and community knowledge to map weak embankments, while AI suggests localized, practical repair solutions and also provide loss and damage information.	Create a transformative protocol, integrating women's voices and needs into readiness and early action plans for surge events.

Outputs: This project has two phases. First one is the research phase which will have the following outputs-

1. Mean Difference between Swell/Surge from sea vs Inland Rivers are calculated
2. Embankments and Land Use Land Cover along the rivers are mapped and weak embankments are identified.
3. Anticipation of probable loss and damage for vulnerable zones are identified with mathematical modeling
4. Indigenous solutions for increasing embankment strength are identified
5. A database of forecast users is prepared and a system is developed for disseminating stakeholder-appropriate auto-generated early warning.
6. AI Model and website/dashboard interface created and functioning along with a technical manual
7. The second phase is trial and piloting phase, which has the following outputs.
8. Women Centered and inclusive Early Action Protocol is developed
9. 405 women and 30 local government institutions have developed capacity to take gender-transformative early actions
10. Piloting for accuracy and efficiency testing of the model and EAP through developing contingency plan and forecast-based financing.
11. Impact Based AI model and EAP is shared, endorsed and incorporated by relevant government authorities and humanitarian actors.

Anticipated Impact:

1. **Enhanced Resilience:** Accurate forecasts and embankment repair guidance reduce losses, saving lives, assets, and livelihoods.
2. **Empowered Women:** Women-centered approach ensures their active participation, reduces vulnerabilities, and transforms gender norms.
3. **Last Mile Preparedness:** Communities gain timely, accessible surge forecasts, enabling proactive actions and minimizing impacts.
4. **Policy Integration:** Project findings incorporated into national disaster strategies, promoting AI adoption and gender transformative approaches.

Why It Matters: Our project revolutionizes surge forecasting and early action, empowering communities, especially women, to thrive despite the challenges of tidal surges. By bridging technology, community knowledge, and gender inclusivity, we pave the way for a more resilient, equitable future in coastal Bangladesh.

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