Increasing agricultural resilience and flood-proofing livelihoods in Bangladesh

Remote sensing innovations for index-based flood insurance

Index-based flood insurance (IBFI) is an innovative approach to developing effective payout schemes for low-income, flood-prone communities. This project aims to integrate hi-tech modelling and satellite imagery with other data to predetermine flood thresholds, which could trigger speedy compensation payouts. Effective end-to-end solutions will be developed in collaboration with a range of organizations and experts from central and state government bodies, private insurance firms, community-based organizations (CBOs) and nongovernmental organizations (NGOs). The project will be piloted in selected locations of India and Bangladesh, making it the first attempt to develop IBFI at a large scale.

Why index-based flood insurance (IBFI)?

Growing population, poor management of land and water resources, and increased exposure to extreme climatic events have left a large number of people vulnerable to floods. A report by The United Nations Office for Disaster Risk Reduction (UNISDR) in 2011 estimated that 800 million people live in flood-prone areas, with 70 million experiencing yearly floods. Floods lead to widespread destruction and human tragedy, severely impacting infrastructure, agriculture and ecosystems. Agricultural communities are subjected to severe economic pressure from flood-induced losses.

Traditionally, flood-risk management has focused on engineered responses, such as dams and flood walls, or rebuilding activities and compensation after the event, particularly in the case of agriculture. However, over the last few decades, evidence has emerged that a broader approach through planning, building regulation and early warning systems can significantly reduce flood losses. Index-based flood insurance (IBFI) is one such solution that is both cost-effective and can better target post-disaster relief to compensate agricultural losses.

5 facts about floods in Bangladesh

1. **74 major flood events** were reported between 1980 and 2015.
2. **12,669 people** were killed and **250 million** affected by floods during this period.
3. **8%** of the areas are at very high risk and **19%** are at high risk of flooding with **economic losses of USD 11.38 billion**.
4. Out of the 64 districts, **36 are severely affected** by floods and key districts include Sirajganj, Gaibandha, Pabna, Gopalganj, Kishoreganj, Brahmanbaria and Madaripur.
5. **Major flood events have occurred in 1988, 1998, 2003, 2004, 2007 and 2012.**

Sources: 1, 2 and 5: EM-DAT 2015; 3 and 4: IWMI South Asia flood mapping studies.

Pilot locations

Sirajganj, Gaibandha and Pabna districts in Bangladesh.
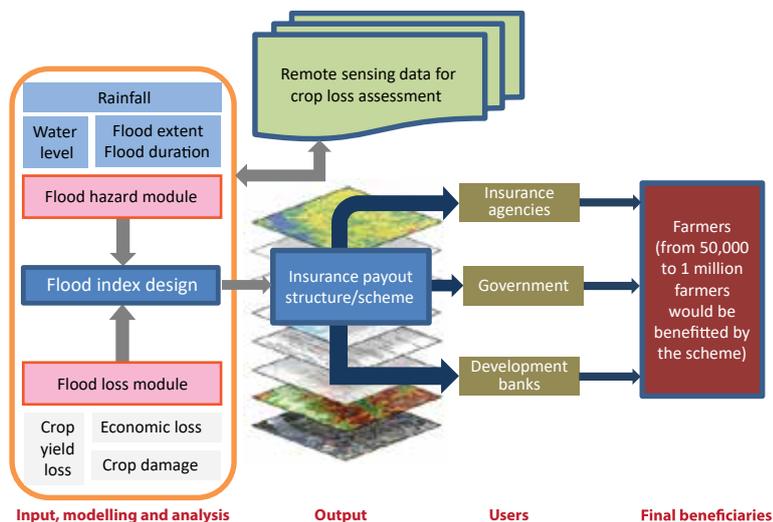
Project

Duration: 2015-2018

Goal: Contribute to sustainable approaches to index-based flood insurance that can help smallholders better manage their flood risk.

Objective: Develop agricultural flood insurance products using remote sensing data and flood modelling tools that can accurately depict yield loss in smallholder farming due to weather and/or other perils, and be scalable in insurance schemes delivered at micro and meso levels.
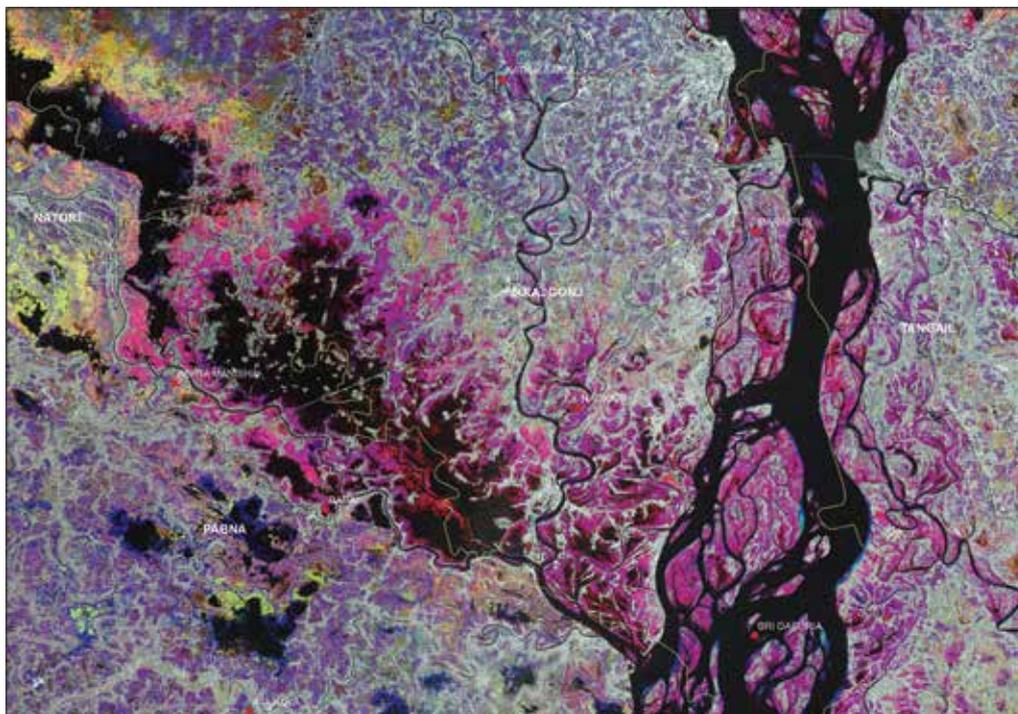
Flooding in Bangladesh as viewed by a Sentinel-1 Synthetic Aperture Radar (SAR) satellite image (August-October 2015) (*Source:* European Space Agency [ESA]).

IWMI International Water Management Institute

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How the project works

| Input, modelling and analysis | Output | Users | Final beneficiaries |

Diagram labels: Rainfall; Water level; Flood extent / Flood duration; Flood hazard module; Flood index design; Flood loss module; Crop yield loss; Economic loss; Crop damage; Remote sensing data for crop loss assessment; Insurance payout structure/scheme; Insurance agencies; Government; Development banks; Farmers (from 50,000 to 1 million farmers would be benefitted by the scheme)

Project outputs

- **Proof-of-concept on IBFI** coupled with the flood hazard model and remote sensing (RS) data in selected districts of South Asian countries.
- **Digital flood mapping tool** to monitor and quantify the impact of floods on crops, and its application in insurance schemes.
- **Design and pilot test** a set of farmer-friendly flood insurance contracts for at least three districts with a considerable number of marginalized female farmers/poor people to ensure contracts are not gender biased.
- **Obtaining feedback** from officials/staff of insurance regulatory authorities in countries, operating insurance companies, meteorological agencies, agricultural research institutions, micro-finance institutions or NGOs, and relevant government agencies (e.g., ministries involved with disaster management, water resources, and agriculture).
- **Policy and institutional guidelines**, supporting gender and inclusiveness, for the implementation of flood insurance.
- **Comparative analysis** of the cost-effectiveness of RS-based index insurance compared to traditional methods, and estimating the potential in other parts of the target countries.
- **Rapid response mapping** to support disaster management in Bangladesh.

Reference

EM-DAT. 2015. The OFDA/CRED international disaster database. Brussels, Belgium: Centre for Research on the Epidemiology of Disasters (CRED), Université catholique de Louvain. Available at http://www.emdat.be (accessed on October 30, 2015).

If the solutions proposed by the project are scaled up, by 2025, approximately 500,000 farmers will have agricultural flood insurance, creating new and different types of jobs supported by strong public-private-partnership business models and delivering BDT 6 billion in flood protection.

Project partners

For more details, contact:

Giriraj Amarnath, Research Group Leader –
Water Risks and Disasters (a.giriraj@cgiar.org)