

Increasing agricultural resilience and flood-proofing livelihoods in Bihar, India

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 Bihar

1. Bihar is India's **most flood-prone state**.
2. **73%** of the total geographical area is annually flooded.
3. **76%** of the population in North Bihar is at risk of flooding.
4. **Major flood events have occurred in 1987, 1995, 1998, 2002, 2004 and 2007.**
5. Muzaffarpur District, alone, incurred **losses of over USD 3 million** per year from 2001 to 2012 due to floods.

Sources: Flood Management Information System (FMIS) and Disaster Management Department, Bihar.

Pilot locations

Muzaffarpur, Darbhanga, Samastipur or Katihar districts in Bihar, India.

Project

Duration: 2015-2018

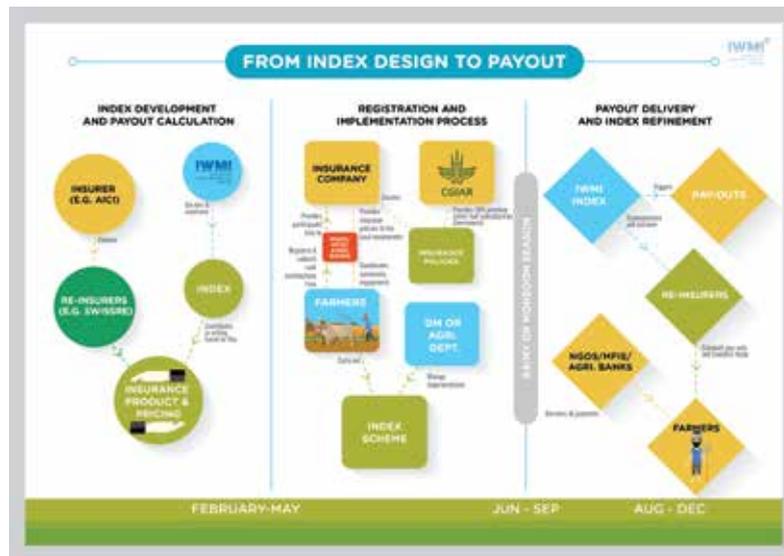
Goal: Contribute to sustainable approaches to index-based flood insurance that can help smallholders better manage their flood risk.

Objective: Develop agricultural flood insurance products using remote sensing data and flood modeling 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.



In 2017, the IBFI scheme was rolled out to 200 farmers in Muzaffarpur District, Bihar, India (photo: Farah Ahmed/IWMI).

How the project works



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 Bihar, and development of **post-flood management plan** to enable the utilization of excess soil moisture to cultivate alternative crops to suit the landscape.

If the solutions proposed by the project are scaled up, by 2025, approximately 1 million farmers will have agricultural flood insurance, creating new and different types of jobs supported by strong public-private-partnership business models and delivering INR 10 billion in flood protection.

Project partners



For more details, contact:

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



IWMI is a
CGIAR
Research
Center
and leads the:



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems

International Water Management Institute (IWMI)
127 Sunil Mawatha, Pelawatte, Battaramulla, Sri Lanka
Mailing address:
P. O. Box 2075, Colombo, Sri Lanka
Tele: +94-11-2880000, 2784080 Fax: +94-11-2786854 Email: iwmi@cgiar.org
Website: www.iwmi.org