



Workshop Report: 2013-66

# Weather Index Insurance: Lessons Learned and Best Practices for Bangladesh



Workshop Report: 2013-66

# Weather Index Insurance: Lessons Learned and Best Practices for Bangladesh

## **Authors**

Ahmed, T. and Hasemann, A.

## **This publication should be cited as**

Ahmed, T., Hasemann, A. WorldFish. (2013). Weather Index Insurance: Lessons Learned and Best Practices for Bangladesh Workshop Report, 8-9 September 2013, Dhaka, Bangladesh. WorldFish, Penang, Malaysia. Workshop Report: 2013-66.

## **Acknowledgments**

The authors would like to thank Dr. Saleemul Huq, Kevin Kamp, Helen Greatrex, Melody Braun and Steve Roddick for contributing to the development of this report.

## Table of Contents

Adaptation to climate change meets disaster risk reduction.....	4
Summary.....	5
Key outcomes from the workshop.....	6
CIMMYT's micro-saving insurance product.....	6
Oxfam launches index-based flood insurance.....	6
It's about the good years.....	6
Should index insurance be used to address loss and damage?.....	6
Who should pay?.....	7
Community fund to cover basis risk.....	8
Data and index model.....	8
Stakeholders – who will champion index insurance in Bangladesh.....	8
Community of practice.....	9
Conclusion.....	9
References.....	10
Annex i.....	11

## **Adaptation to climate change meets disaster risk reduction**

All countries, whether rich or poor, have suffered from weather-related hazards and even disasters for centuries, including hurricanes, cyclones, typhoons, floods, droughts and landslides. All countries have developed some national mechanisms to prepare for such disasters and to respond to them after they occur.

Human-induced climate change adds another dimension to this traditional arena of disaster risk reduction (DRR) by making the frequency and magnitude of weather-related disasters greater. In the climate change global policy arena under the United Nations Framework Convention on Climate Change (UNFCCC), this issue covers both adaptation to climate change (ACC) and the new, emerging topic of loss and damage (L+D) from climate change.

Index-based insurance (IBI) is an emerging tool that cuts across these three arenas; namely, DRR, ACC and L+D. It is in this spirit that the International Centre for Climate Change and Development (ICCCAD) at the Independent University, Bangladesh (IUB), together with WorldFish, undertook an initial scoping study and then convened a workshop with relevant stakeholders in Bangladesh to explore the interest in this topic.

We are very pleased with the results of the initial scoping and the workshop, where a new “community of interest” in IBI was set up. On behalf of ICCCAD, we are committed to supporting and facilitating this community of interest and transforming it into a “community of practice” over time. We hope that this workshop report will be the start of this community of interest and practice in IBI.



Saleemul Huq  
Director  
International Centre for Climate Change and Development,  
Independent University, Bangladesh

## Summary

WorldFish and the International Centre for Climate Change and Development (ICCCAD) held a two-day workshop on the topic of Weather Index-Based Insurance: Lessons Learned and Best Practices for Bangladesh. Weather index insurance is based on a predefined weather event which when triggered ensures automatic payout to farmers who have taken out insurance. For example, the climatic trigger could be a predefined consecutive number of days where rainfall is below a set level or when the floodwater level reaches above a certain point. Index insurance has been operating for about 10 years in many countries but is still at an early stage in Bangladesh, where there are two schemes currently being piloted and three other projects being developed. Further information can be found in the scoping report: Current Status of Index-Based Insurance in Bangladesh (<http://www.worldfishcenter.org/resources/publications/scoping-report-current-status-index-based-insurance-bangladesh>), which was conducted to inform the design and objectives of the workshop.

The aim of the two-day workshop was twofold: to ascertain the present state of index insurance in Bangladesh and elsewhere, and to work together to identify ways forward. Day one was about learning and sharing information, and day two focused on group work, identifying opportunities, problem solving and ways to move the index insurance agenda forward. It was essential that the workshop was action oriented and that as a result of the workshop the ideas and connections made continued to advance index insurance in Bangladesh.

The workshop was attended by around 30 participants who are experts and practitioners in index insurance related activities.

They represent the following organizations:

- Bangladesh Institute of ICT in Development (BIID)
- Bangladesh Meteorological Department (BMD)
- BRAC
- Center for Environmental and Geographical Information Services (CEGIS)
- Institute of Water Modelling (IWM)
- International Centre for Climate Change and Development (ICCCAD)
- International Finance Corporation (IFC)
- International Maize and Wheat Improvement Center (CIMMYT)
- Microcredit Regulatory Authority
- Ministry of Water Resources (WARPO)
- North-South University
- Oxfam Bangladesh
- Palli Karma-Sahayak Foundation (PKSF)
- Pragati Insurance Limited
- Sadharan Bima Corporation (SBC)
- The International Research Institute for Climate and Society (IRI)
- World Food Programme (WFP)
- WorldFish

### Key outcomes from the workshop

- Mapping of the current status of index insurance in Bangladesh
- Better understanding of the opportunities and challenges in implementing index insurance
- Identification of stakeholders
- First step in forming a community of practice
- Demand for future meetings to share information

### CIMMYT's micro-saving insurance product

The International Maize and Wheat Improvement Center (CIMMYT), along with Helmholtz Centre for Environmental Research and Crawford School of Public Policy, has recently started designing a weather index-based micro-saving insurance product for farmers in Southern Bangladesh. The project, which will be running until April 2014, was presented by Dr. Fred Rossi. Currently, CIMMYT is testing the financial viability of an insurance product that insures dry-season crops against flooding from January to May and also includes savings and credit components. The specifics of the model and contract are currently being worked out.

### Oxfam launches index-based flood insurance

Oxfam is currently developing a meso-level index-based flood insurance program in collaboration with the Institute for Water Management (IWM), CIRM, Pragati Insurance Ltd., Swiss Re, and Manab Mukti Sangstha (MMS), a local NGO. Mr. Kazi Azam from Oxfam introduced the project at the workshop and gave an overview of its modalities. Payouts will be calculated based on the data from a flood model developed by IWM. Final contracts between the agency partners were signed in August 2013, and the product has been successfully launched. The premium is 10.3 percent of the sum insured, with the average insured sum per family being 8000 BDT (approximately 100 USD). The project currently has 1661 beneficiaries.

### It's about the good years

Dr. Helen Greatrex from the International Research Institute for Climate and Society (IRI) gave a presentation on "Index Insurance Design and Implementation." IRI has been instrumental in developing and introducing index-based insurance and has been undertaking schemes for 10 years in more than 15 countries in Africa and Latin America. Dr. Greatrex explained that climate risk is experienced at two levels—through direct impacts such as droughts or floods and through the threat of a bad harvest year. It is therefore paramount for farmers to increase productivity in normal years in order to cover losses in bad years. However, strategies that increase productivity, such as buying high-quality seeds, lead to increased risk.



Dr. Helen Greatrex sharing IRI's experience of index insurance from around the world

For IRI, "it's about the good years"—and their schemes focus on providing insurance to relax the risk of a bad year and to ensure that productivity options are unlocked. For a scheme to be successful, it has to have a solid science base, it must be integrated into a wider risk management program, it must ensure that farmers understand basis risk, and it should be designed as simply as possible so that it is easily understood by the wide variety of stakeholders involved (farmers, cooperatives, NGOs, insurers, banks, agronomists, scientists and re-insurers). IRI develops localized schemes in consultation with farmers. Successful schemes include the Kilimo Salama project in Kenya/Rwanda and the R4 project Ethiopia/Senegal, which insure a combined 50,000 farmers against a lack of rainfall and are part of holistic risk reduction projects. To date, IRI's index insurances have been purchased by tens of thousands of farmers, despite the premiums being unsubsidized.



A 'good' year

### Should index insurance be used to address loss and damage?

Loss and damage is a newly emerging topic in the global climate change debate that is rapidly gaining importance. The concern with loss and damage stems from the realization that currently neither mitigation (i.e., the prevention of greenhouse gases) nor adaptation (i.e., adapting to the negative impacts of climate change) efforts are enough to prevent current or future loss and damage due to climate change. Loss is generally thought of as the impacts of climate change that cannot be recovered, while damage is characterized as those impacts that can be recovered (Kreft et al., 2012). While a general definition of loss and damage has not yet been agreed upon, a working definition is the "negative effects of climate variability and climate change that people have not been able to cope with or adapt to" (Warner et al., 2012).

A range of approaches are required to address loss and damage, many of which originate in the climate change adaptation community, such as risk reduction, risk retention, risk transfer and approaches to slow-onset processes (UNFCCC, 2012). Index-based insurance, falling under the risk transfer category, is an important approach that, while not eliminating the risk of loss and damage, can reduce human suffering and development setbacks that result from climate change impacts (Ibid).

Currently, insurance covers only around 3 percent of disaster losses in developing countries, compared to 40 percent in industrialized countries (Warner et al., 2009), which means there is significant potential for growth, with many new markets—such as Bangladesh—emerging. However, insurance as an approach to addressing loss and damage is controversial, as it is widely held that the climate vulnerable should not be paying premiums to insure themselves against impacts for which they are not responsible (Warner et al., 2010; see more below).

To effectively address loss and damage, any (index-based) insurance model should be linked with an ex ante climate risk management strategy. Such a risk-layering approach combines cost-effective risk reduction aimed at low-impact frequent events with insurance for high-impact, high-frequency events. Insurance can also create a space of certainty, thus enabling decision making and reliable provision of public services (Warner et al., 2012). However, already existing limitations to insurance

are exacerbated by climate change and its impact on loss and damage. Insurance does not prevent or reduce direct losses and damages, for example, and is not always the most cost-effective tool for risk management. Moreover, climate change creates new challenges for insurance, such as potential un-insurability due to increased frequency and magnitude of extreme weather events, and traditional insurance not being suitable for slow-onset processes such as sea level rise or salinization (Warner et al., 2009). Ultimately, underlying risk factors such as poverty, food insecurity, natural resource depletion, etc. will have to be addressed as part of a comprehensive disaster risk management approach. Insurance products need to be made accessible, affordable, desirable and understandable for low-income and rural households in the developing world. Consequently, enabling conditions such as good regulatory frameworks and data bases are needed; these enabling conditions require technical and financial assistance to assess loss and damage (Khan et al., 2013).



A flooded village

## Who should pay?

One topic that was continuously debated throughout the workshop was the question of who should pay for insurance premiums. Does the polluter-pay principle apply here or should farmers pay for themselves and become self-reliant? What about those farmers that do not have the ability to pay? It was stated several times that some of the money that donors have promised to put toward fighting climate change from 2020 on should go toward insurance schemes.

Interestingly, IRI's very successful insurance schemes are not subsidized and target the poorest population groups; that is, those without mobile phones. While the cheapest premium option costs around 3 USD, on average farmers purchase premiums costing 19 USD. This is to some extent made possible by IRI's projects that allow farmers to pay partially for premiums with labor and by the fact that if the insurance is used to encourage people to invest in more productive technologies, the profits generated in good years will cover the premium and the losses of the bad years.

This proactive approach gives people agency and often inspires them to take more risks. Dr. Greatrex mentioned that, for example, a recent Yale study found that out of farmers who were given a choice between insurance and a loan, those who chose insurance invested more into their farms. A study evaluating IRI's R4 scheme found that farmers who had at the beginning paid for their premiums through labor were moving more and more toward paying with cash as the insurance scheme allowed them to amass more capital.

**Recommendation: Link index insurance with loss and damage and risk-transfer communities.**



Group discussion during the workshop

## Community fund to cover basis risk

Basis risk is the potential mismatch between insurance payout and actual loss. To reduce the occurrence of basis risk, the insurance product has to be designed using detailed, good-quality data and tailored to cover different circumstances. However, insurance cannot cover every scenario; weather events may fall just below the insurance trigger point or crops may be affected by circumstances not covered by the insurance. Therefore, farmers must have alternative mechanisms to manage impacts not covered by index insurance. One option could be a community fund, where members of an area pay into a fund which is then used to assist farmers affected by events outside of the insurance contract. The community will need to decide who will manage this fund and set terms for when it will be paid out.

## Data and index model

### Meteorological data

The index created to reflect the impact of the weather on crop yield will only be as reliable and accurate as the quality of the data input into the system. There are numerous weather conditions that can have an effect on agricultural production, including rain, temperature, humidity, wind, water salinity, flood water level, etc.; however, index insurance usually only focuses on one type of weather, most commonly the level of rainfall (too much or too little), temperature, or flood water level, and possibly only during a specific time or season of the year. The Bangladesh Meteorological Department (BMD) has 35 weather stations throughout Bangladesh and records daily weather information. It was announced at the workshop by the BMD that there are plans to install approximately 100 more automatic weather stations within the next two years. The increased coverage of weather stations will improve the accuracy of the data and index.

### Agronomic data

Agricultural data is also required to understand what time of year different products require insurance coverage and when they are most at risk to weather variables. In addition, the production level for crops is vital to the assessment of the quantities to be insured. A major gap identified in agricultural data is that no data exists on the quantity of crops lost due to weather damage.

### Flood modeling

Mr. Shah-Newaz from the Institute of Water Modelling (IWM) demonstrated the technical expertise required to produce a complex index model. The IWM developed a flood model capable

of generating index-based flood data and information that is reliable and accurate. The model was produced using information on river geometry and real-time hydrological data. The flood model outputs are used for damage assessment and fixation of insurance premium and payout schemes.

## Challenges of weather system in Bangladesh

Usually an area covered by weather index insurance is defined by the parameters of coverage of a specific weather station. In Bangladesh, agricultural production is affected by weather conditions not only in Bangladesh but also in neighboring countries. For example, the level of rainfall in parts of India affects the water released by Indian dams on the main rivers, and the resulting water flow into Bangladesh will affect the moisture in the soil or the risk of floods. This poses a challenge for index insurance in Bangladesh: Will data need to be collected from outside of Bangladesh, and if this is not viable, will weather index insurance not be applicable to these areas?

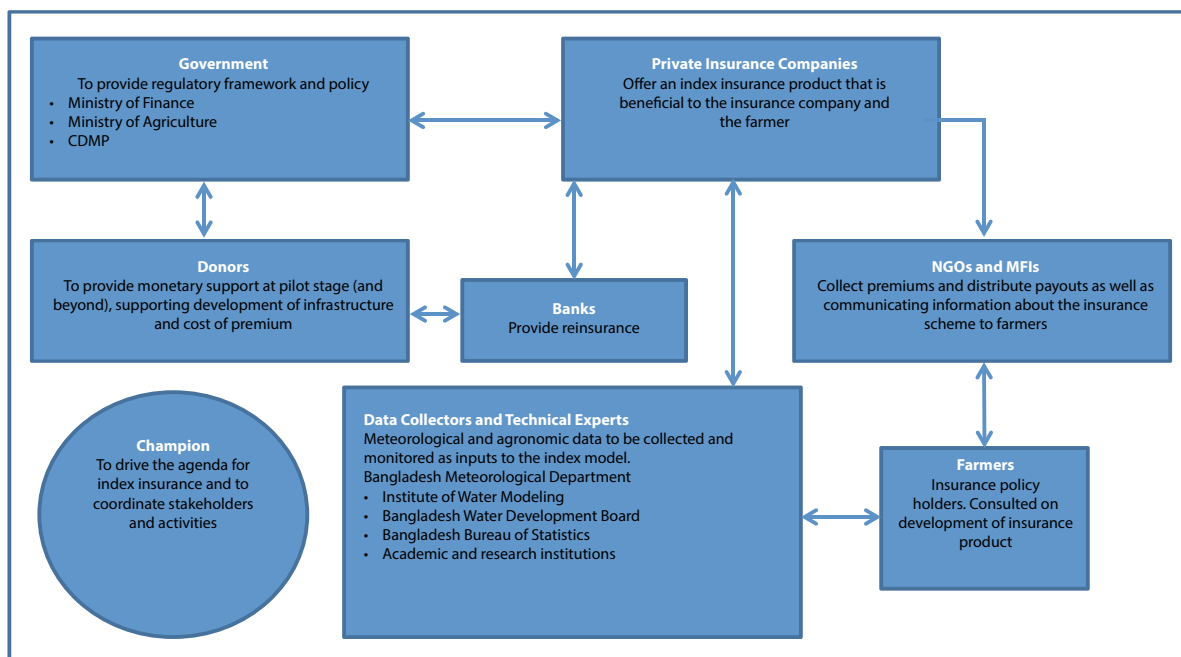
## Stakeholders—who will champion index insurance in Bangladesh?

During the workshop, an exercise was undertaken to map all the stakeholders required to implement index insurance in Bangladesh.

The diagram of stakeholders demonstrates that one of the major challenges facing index insurance in Bangladesh is how to bring the different stakeholders together to work toward successful implementation. Workshop participants identified the need for a champion to promote index insurance and to coordinate the large number of stakeholders and activities. However, who the champion should be was undecided.

The government and private insurance companies were identified as the two main stakeholders with leading roles. Without government approval and involvement in regulation, index insurance will not be viable in Bangladesh. In addition, private insurance companies need to offer index insurance coverage to farmers. Private insurance companies will only offer index insurance if there is profit to be made through a viable business model. Although index insurance needs to work as a business, it is important to note here that the primary purpose of index insurance is to protect farmers against the uncertainty of climate change, allowing them to transfer risk and avoid falling into poverty.

**Recommendation: ICCCAD and the community of practice to start dialogue with relevant government departments and with private insurance companies.**



Stakeholder mapping: index insurance key stakeholders in Bangladesh



## Community of practice

One of the most important outcomes from the workshop is the formation of a community of practice for index insurance in Bangladesh. Workshop participants agreed that while index insurance is at an early stage in Bangladesh, it is beneficial for all involved to have a forum where progress can be shared, ideas can

be discussed, and challenges can be worked out together. An online community forum has been created where members can share information and raise questions and discussions. A Web page with signposting to resources has also been created. The Web page contains all the presentations from the workshop as well as links to relevant reports.



Stakeholder mapping

- **Recommendation: Form a community of practice to continue discussions and keep updated on index insurance developments in Bangladesh.**
- **Recommendation: Workshop participants and other stakeholders to reconvene in 2014 to discuss progress made within their organizations, including reporting on pilot projects.**

## Conclusion

The workshop highlighted that there is a great deal of interest around weather index insurance in Bangladesh. The challenge is now to cultivate that enthusiasm within the participants' organizations, to engage other stakeholders and to work together. Without collaborations between government, private insurance companies, technical experts, NGOs, farmers, and others, index insurance cannot progress to large-scale implementation.

Many opportunities exist to apply index insurance in Bangladesh. There are plans to improve the collection of weather data, there is an existing network of NGOs with good rural reach, and Bangladesh already has a history of and familiarity with microfinance. However, there are challenges: the complex weather system, the fatalistic culture of farmers in accepting the impacts of weather events, and the need to develop a business model that will attract private insurance companies. All of these challenges will become manageable if there is dialogue and engagement with the relevant organizations and communities. This is something that the community of practice can begin to address.

## References

- Khan, M. R., Roddick, S., and E. Roberts (2013). *Assessing Microinsurance as a Tool to Address Loss and Damage in the National Context of Bangladesh*. Dhaka: International Centre for Climate Change and Development.
- Kreft et al. (2012) *Framing the loss and damage debate: A thought starter by the Loss and Damage in Vulnerable Countries Initiative* [online] Available at: <http://www.lossanddamage.net/download/6530.pdf>
- UNFCCC (2012). *A literature review on the topics in the context of thematic area 2 of the work programme on loss and damage: a range of approaches to address loss and damage associated with the adverse effects of climate change* FCCC/SBI/2012/INF.14.
- Warner, K., Ranger, N., Surminksi, S., Arnold, M., Linneroth-Bayer, J., Michel-Kerjan, E. Kovacs, P., and C. Herweijer (2009). *Adaptation to Climate Change: Linking Disaster Risk Reduction and Insurance*. Geneva: UNISDR.
- Warner, K., Zissener, M., Kreft, S., Höpfe, C., Linnerooth-Bayer, J., Haas, A., Gurenko, E., Loster, T. and I. Burton (2010) *Solutions for Vulnerable Countries and People: Designing and Implementing Disaster Risk Reduction and Insurance for Adaptation* [online] Available at: [http://www.climate-insurance.org/upload/pdf/082010\\_MCII\\_Policy\\_Brief\\_2010.pdf](http://www.climate-insurance.org/upload/pdf/082010_MCII_Policy_Brief_2010.pdf)
- Warner et al. (2012) *Insurance solutions in the context of climate change-related loss and damage: Needs, gaps, and roles of the Convention in addressing loss and damage*. Munich Climate Insurance Initiative (MCII) submission to the SBI Work Programme on Loss and Damage, October 2012. Policy Brief No. 6. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS).

## Annex i

### Workshop Participants

Name	Organization
Arun Kumar Saha	Asian Development Bank (ADB) (retired)
Ruhun Wasata	Bangladesh Institute of ICT in Development (BIID)
Sumaiya Nour	Bangladesh Institute of ICT in Development (BIID)
Md. Shameem Hassan Bhuiyan	Bangladesh Meteorological Department (BMD)
Taslim Reza	BRAC
Anwar Ali	Center for Environmental and Geographical Information Services (CEGIS)
Saniruzzaman Suvo	Center for Environmental and Geographical Information Services (CEGIS)
Sardar M Shah-Newaz	Institute of Water Modelling (IWM)
Anna Hasemann	International Centre for Climate Change and Development (ICCCAD)
Saleemul Huq	International Centre for Climate Change and Development (ICCCAD)
Tajbee Ahmed	International Centre for Climate Change and Development (ICCCAD)
Tariq Mohsen	International Centre for Climate Change and Development (ICCCAD)
Saiyab Amal Ahmed	International Finance Corporation (IFC)
Frederick Rossi	International Maize and Wheat Improvement Center (CIMMYT)
Muhammed Mazedul Haque	Microcredit Regulatory Authority
Mohammad Alamgir	Ministry of Water Resources (WARPO)
Mizan Khan	North-South University
Kazi NMN Azam	Oxfam Bangladesh
M. Shazzadul Karim	Palli Karma-Sahayak Foundation (PKSF)
Zahir Uddin Ahmed	Palli Karma-Sahayak Foundation (PKSF)
Mamunul Hassan	Pragati Insurance Limited
Md. Abdus Salam	Sadharan Bima Corporation (SBC)
Md. Amir Hossain Mia	Sadharan Bima Corporation (SBC)
Tauhiduddin Md Zahed	Sadharan Bima Corporation (SBC)
Helen Greatrex	The International Research Institute for Climate and Society (IRI)
Malik Kabir	World Food Programme (WFP)
Omar Farook	World Food Programme (WFP)
Kevin Kamp	WorldFish
Khondker Murshed-e-Jahan	WorldFish
Melody Braun	WorldFish



Workshop participants



## *Harnessing research that makes a difference*

This publication should be cited as: Ahmed, T., Hasemann, A. WorldFish. (2013). Weather Index Insurance: Lessons Learned and Best Practices for Bangladesh Workshop Report, 8-9 September 2013, Dhaka, Bangladesh. WorldFish, Penang, Malaysia. Workshop Report: 2013-66.

Photo credits: Front and back cover, CBFM-Fem Com Bangladesh and Jharendu Pant

Printed on 100% recycled paper.

© 2013. WorldFish. All rights reserved. This publication may be reproduced without the permission of, but with acknowledgment to, WorldFish.



Contact Details:  
WorldFish, PO Box 500 GPO,  
10670 Penang, MALAYSIA  
Web: [www.worldfishcenter.org](http://www.worldfishcenter.org)