



Case Study

# Weather Index Insurance Pilot | Chitalmari, Bogra

Global Index  
Insurance Facility





## Background

Crop Insurance, and more specifically Weather Index Insurance (WII), is a hitherto unexplored market in Bangladesh. The state-run Sadharan Bima Corporation (SBC) has suspended its initial (1975-99) pilots on Multi-Peril Crop Insurance (MPCI) owing to unsustainable claim ratios. In the last decade, several multilateral organizations and international NGOs (e.g. ADB, Oxfam) have tried to implement index-based insurance in Bangladesh although with limited scale.

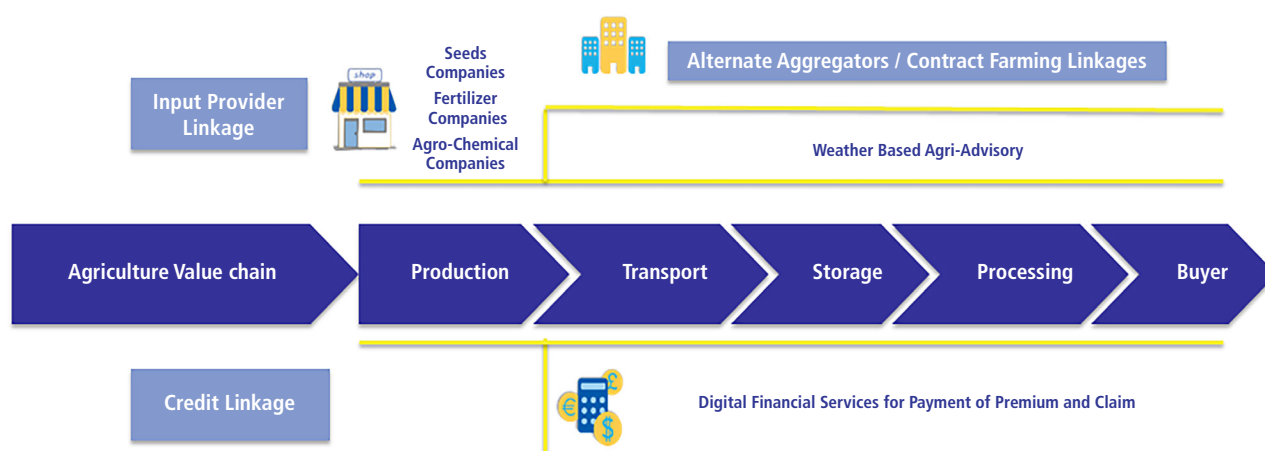
In 2015, the International Finance Corporation (IFC), supported by the Global Index Insurance Facility (GIIF), launched the Weather Index Insurance project with Green Delta Insurance Company (GDIC), to develop insurance products to address perils such as drought, excess rain, heat waves and cold spells in Bangladesh. IFC created and deployed a weather data grid providing a spatially smooth source of interpolated weather data (rainfall and temperature) for every 5sq. km of Bangladesh. The data grid archives such interpolated data from the last 30 years, in addition to being updated every week based on Bangladesh Meteorological Division's (BMD) weather updates.



## Implementation Model

Rather than selling WII directly to the farmers, the global trend is on delivering agriculture insurance through a value chain bundled approach, where the insurance company ties up with one or more agencies providing finance, input, or contract farming support to the farmers. Apart from reducing the transaction cost, this approach helps the insurer in creating a network effect, reaching scale and delivering value to the farmers through partial or full subsidy by the partner agency. The partner agencies also find value in such approach since their business objectives are inversely related to the anomalies of the insured weather events.

**Figure 1:** Complete View of Agriculture Value Chain and Insurance Bundling Possibilities



Source: Bundling to Make Agriculture Insurance Work; Mukherjee et al.; ILO, 2016.

In this project, IFC and GDIC reach farmers through all potential organizations that provide support to the farmers during crop production i.e. finance providers (Banks/MFI), agriculture input companies, contract farming entities, farmer associations and, NGOs. The product and the delivery methodology are customized to each of the partners' business model.

## The Chitalmari Experiment

Chitalmari in Bogra district of Bangladesh is a climate vulnerable area due to uneven precipitation, storms, and temperature fluctuations. A team from GDIC visited the farmers in the area in July 2016. After five focus group discussions conducted with the farmers, the team deciphered that unseasonal rainfall during the seed germination stage of tomato (early November) was one of the main weather challenges that caused massive economic damages in recent years. GDIC also partnered with Renaissance, and NGO working with the farmers on financial and input provision areas.



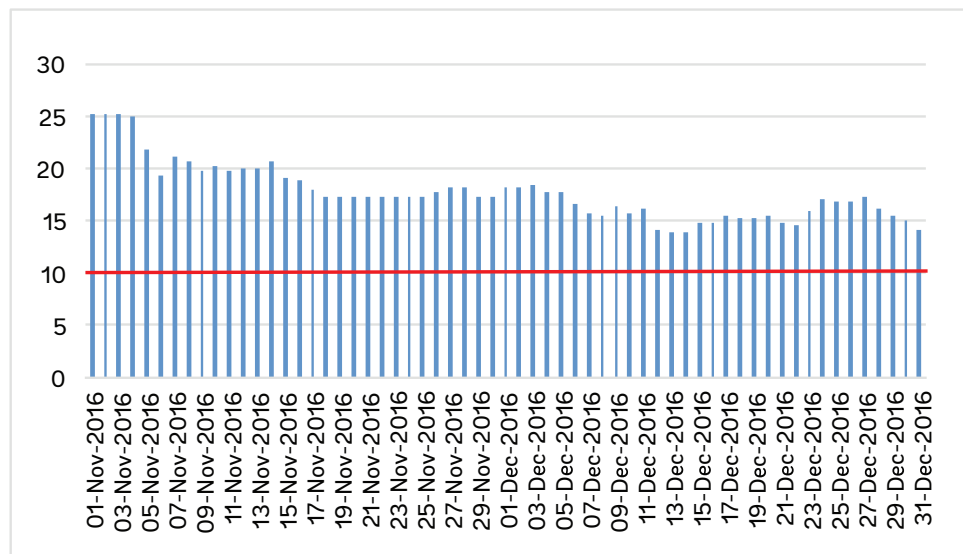
### The Product

Based on the input of the farmers and the archived weather data, IFC actuaries developed a customized weather index insurance for the tomato farmers of Chitalmari in Bogra. The Product details were as follows:

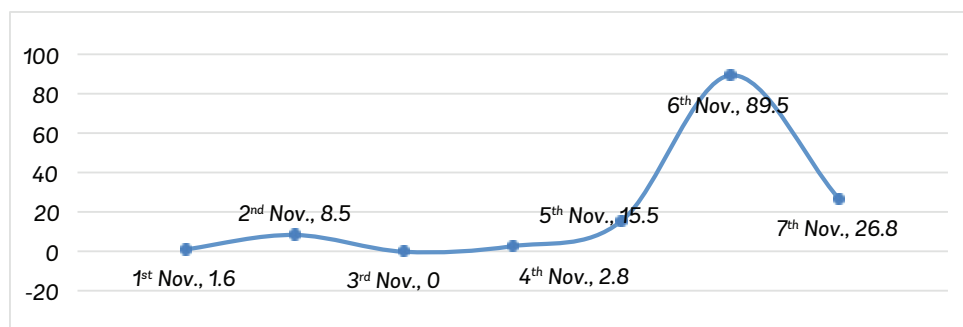
Risks covered	<b>Two Types of Excess Rainfall events (Wet Spell + Excessive Rainfall) and Cold Spell</b>	
Term	1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016 (61 days)	
Wet Day definition	Over 1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016, if the Daily Rainfall is MORE than 3 mm, then a 'Wet Day' is said to occur.	
Wet Spell Payout	The following payouts are made depending on the number of Consecutive 'Wet Days' during 1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016:	
	Number of Consecutive 'Wet Days'	Payouts (% of Sum Insured)
	2–4 days	5%
	5–7 days	10%
	8–10 days	15%
	11–13 days	20%
	14 days or more	25%
Excess Rainfall definition	During 1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016, if the cumulative rainfall over any 3 consecutive days is more than <b>150 mm</b> then an 'Excess Rainfall' event is said to occur.	
Excess Rainfall payout	The payout is linearly dependent on amount of cumulative rainfall excess of the <b>150 mm</b> trigger, with a maximum payout of <b>50%</b> of Sum Insured for <b>300 mm</b> cumulative rainfall. If cumulative rainfall exceeds <b>300 mm</b> , no additional payout (above 50%) will be made. The rate of increase for the payout is 0.33% for every 1mm increase above the Trigger.	
Cold Day Definition	Over 1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016, if the Daily Minimum Temperature is LESS than 10 degrees Celsius, then a 'Cold Day' is said to occur.	

Cold Spell Payout	The following payouts are made depending on the number of Consecutive 'Cold Days' during 1 <sup>st</sup> November 2016 – 31 <sup>st</sup> December 2016:	
	Number of consecutive 'Cold Days'	Payouts (% of Sum Insured)
	3-4 days	5%
	5-6 days	10%
	7-8 days	15%
	9-10 days	20%
	11 days or more	25%
Sum Insured	BDT 5,000 per Acre (farmers have expressed this as the per acre production cost).	
Premium Rate	<b>5.1%</b> of Sum Insured (BDT 255 per BDT 5,000 Sum Insured amount) (Before VAT/any other taxes) Net Premium BDT. 510.00 <b>VAT 15%    BDT. 76.50</b> <b>Grand Total    BDT. 586.50 (for Sum Insured of 10,000 SI)</b>	

**Figure 2:** Minimum temperature - 1<sup>st</sup> November – 31<sup>st</sup> December 2016



**Figure 3:** Rainfall - 1<sup>st</sup> November – 31<sup>st</sup> December 2016

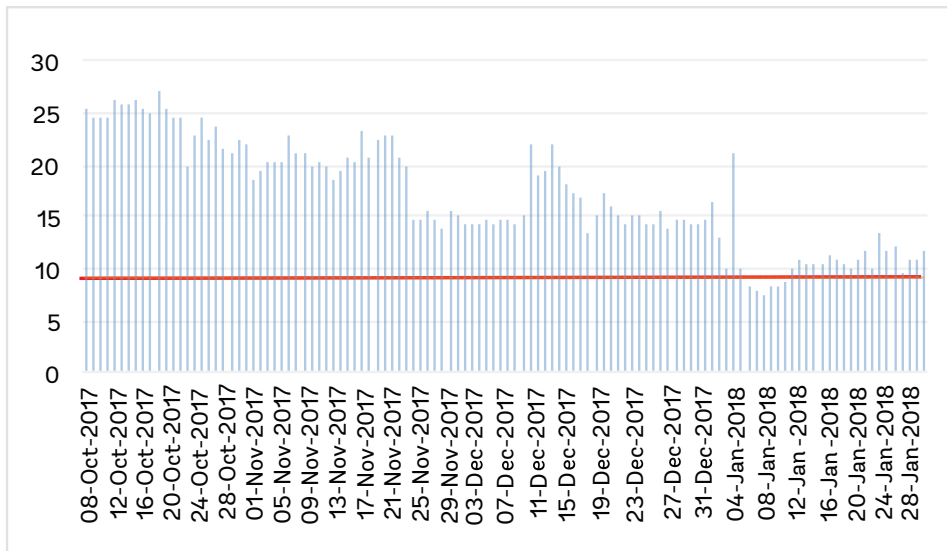


Data point for verification of rainfall and temperature was CHITALMARI, Bagerhat, Khulna (GPS is 89.9 , 22.8). This is an interpolation data point, meaning in absence of the weather data grid, it would have been impossible to track weather data of this area.

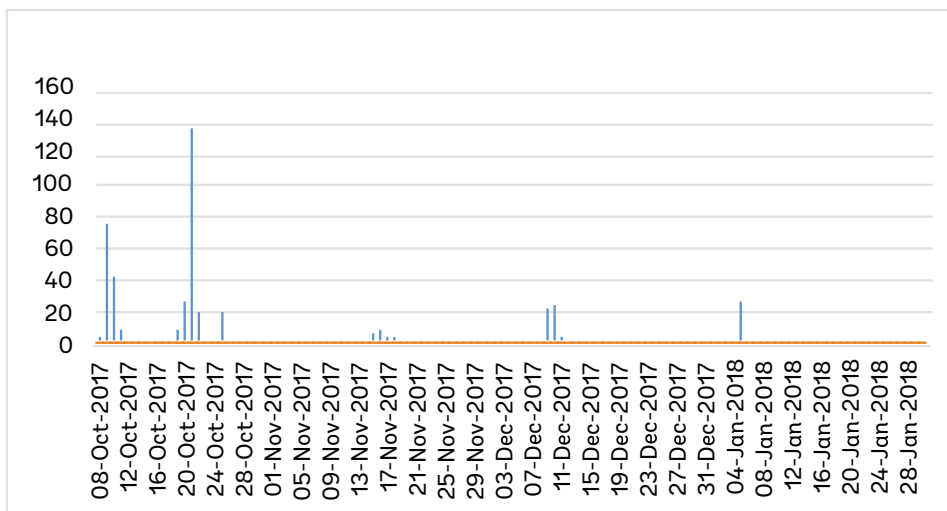
### Implementation

Despite more than 15 awareness trainings organized with more than 2,000 farmers, only 100 agreed to pay premium for the WII in 2016. This was also in spite of the NGO subsidizing 75% of the premium made available by its other donor sources. Though lack of awareness was one of the factors, the farmers mostly did not trust that the insurance company would pay their due claim in time. The anticipated hassle of claiming for the insurance also added to their aversion. The product was launched finally on November 1st with 200 farmers having 320 acres of land.

**Figure 4:** Minimum temperature - 8<sup>th</sup> October 2017 – 31<sup>st</sup> January 2018



**Figure 5:** Rainfall - 8<sup>th</sup> October 2017 – 31<sup>st</sup> January 2018





## Weather Trend

Minimum temperature during the coverage period never went below the threshold trigger level of 10 degree Celsius. Hence, there was no claim triggered due to the 'Cold Spell' coverage.

However, in the first week of November, there was heavy unseasonal rainfall causing damage to the germinating crop. The data grid recorded three days of consecutive wet spell, which triggered 5% claim on the sum insured.

Risks covered	<b>Two Types of Excess Rainfall events (Wet Spell + Excessive Rainfall) and Cold Spell</b>	
Term	8 <sup>th</sup> October 2017 – 31 <sup>st</sup> January 2018	
Wet Day definition	Over 8 <sup>th</sup> October 2017 – 31 <sup>st</sup> January 2018, if the Daily Rainfall is MORE than 3 mm, then a 'Wet Day' is said to occur.	
Wet Spell Payout	The following payouts are made depending on the number of Consecutive 'Wet Days' during 15 <sup>th</sup> November 2017 – 28 <sup>th</sup> February 2018:	
	Number of Consecutive 'Wet Days'	Payouts (% of Sum Insured)
	4-6 days	5%
	7-9 days	10%
	10-12 days	15%
	13-15 days	20%
	16 days or more	25%
Excess Rainfall definition	During 8 <sup>th</sup> October 2017 – 31 <sup>st</sup> January 2018, if the cumulative rainfall over any 3 consecutive days is more than <b>165 mm</b> then an 'Excess Rainfall' event is said to occur.	
Excess Rainfall payout	The payout is linearly dependent on amount of cumulative rainfall excess of the <b>100 mm</b> trigger, with a maximum payout of <b>50%</b> of Sum Insured for <b>365 mm</b> cumulative rainfall. If cumulative rainfall exceeds <b>300 mm</b> , no additional payout (above 50%) will be made.	
Cold Day Definition	Over 8 <sup>th</sup> October 2017 – 31 <sup>st</sup> January 2018, if the Daily Minimum Temperature is LESS than 9 degrees Celsius, then a 'Cold Day' is said to occur.	
Cold Spell Payout	The following payouts are made depending on the number of Consecutive 'Cold Days' during 15 <sup>th</sup> November 2017 – 28 <sup>th</sup> February 2018:	
	Number of consecutive 'Cold Days'	Payouts (% of Sum Insured)
	4-5 days	5%
	6-7 days	10%
	8-9 days	15%
	10-11 days	20%
	12 days or more	25%
Sum Insured	BDT 5,000 per Acre recommended.	
Premium Rate	<b>6.0%</b> of Sum Insured (BDT 300 per BDT 5,000 Sum Insured amount) (Before VAT/any other taxes) Net Premium BDT. 300.00 <b>VAT 15%     BDT. 45.00</b> <b>Grand Total    BDT. 345.00 (for Sum Insured of 10,000 SI)</b>	

## Claims

GDIC monitored the weather fluctuations from the data grid. The unseasonal rainfall in Chitalmari was updated in the weather data grid by the following week and the farmers were notified of the claim through the NGO immediately. This was a unique experience for the farmers since,

- This was the first time the insurance company proactively informed them about the claim trigger, without the farmers having to approach the insurer;
- The claim was triggered and paid within 15 days of the insured event, without the farmers having to wait for the coverage period.

In a public event organized by GDIC and IFC, the farmers were paid the claim for the insurance through the NGO.

## After Effect

Though the amount of claim paid in the first pilot was small (BDT80,000), it helped boost the farmers' morale. Apart from being assured of the trustworthiness of the insurance company and WII, they could realize the benefit of insurance in their crop production activities. In the next season, where these farmers grow vegetables (cucumber, bitter gourd), 1,200 farmers have purchased WII products of GDIC without any subsidy. These pilots, however, did not result in any claim.

## Second Pilot for Tomatoes

The 1<sup>st</sup> pilot for tomatoes in 2016 has created popularity of WII amongst the Tomato farmers of Chitalmari. In 2017, 2,000 farmers purchased WII products covering the entire tomato crop cycle from October to January. It is important to note that there was no subsidy involved in the pilot of 2017.

## Product

Though the area, season, and the crop did not change, depending on farmers' demand and continuous evolution of weather data, the product was modified in the second pilot. The new product was as follows:

## Weather Trend and Claim

One week within the coverage period, there was heavy rainfall for four days (8th – 12th October). However, the rainfall on 8th October was only 2.7mm, less than the minimum trigger for the wet spell cover. Hence, no claim was paid. The following fortnight, however, witnessed another spell of downpour for four consecutive days, resulting in 5% payout for wet-spell. During this four days, the cumulative rainfall recorded rainfall was 182.3.1mm, 17.3mm more than the excessive rainfall coverage trigger. This resulted in another claim trigger of 4.33% of the sum insured. In total, this rainfall spell triggered a claim of 9.33% of the sum insured. Like last year, GDIC immediately informed the farmers of the claim and handed over the claim. The claim settlement ceremony was attended by the state Minister of Finance in addition to the Chairman of Insurance Development and Regulatory Authority (IDRA) of Bangladesh.



*In a public event organized by GDIC and IFC, the farmers were paid the claim for the insurance.*

Though the farmers witnessed another seven days of rainfall during the coverage period, none of these hit the claim trigger. Farmers did not report any material loss in their crop due to these unseasonal rains. However, from 7th to 12th January, the period for fruit development, the temperature fell below the trigger of 9 degree Celsius for six consecutive days. This resulted in another 10% of claim which was given to the farmers post the coverage period. Hence, the farmers received 19.33% of sum insured as claim, which was commensurate with the economic loss they had incurred in their crop.

With the four pilots in the area, especially the Tomato pilots, the farmers in Chitalmari have become aware and eager to purchase WII.

The success of the pilot in Chitalmari can be attributed to:

- The weather data grid that enabled GDIC to design and monitor the WII products at the remotest corner and settle claims within a fortnight of occurrence of the insured event;
- Slow introduction and constant awareness building measures taken by the partner NGO and GDIC;
- Bundling of the WII with the Agri-value chain of the farmers that helped reach a substantial volume;
- Prompt information and settlement of claims without waiting for the coverage period that helped the farmers take corrective actions on field with the insured money.

## About Global Index Insurance Facility

The Global Index Insurance Facility (GIIF) is a dedicated World Bank Group's program that facilitates access to finance for smallholder farmers, micro-entrepreneurs, and microfinance institutions through the provisions of catastrophic risk transfer solutions and index-based insurance in developing countries. Funded by the European Union, the governments of Germany, Japan, and the Netherlands, GIIF has facilitated more than 3 million contracts, covering approximately 15 million people, primarily in Sub-Saharan Africa, Asia, and Latin America and the Caribbean.

For more information, please visit [www.indexinsuranceforum.org](http://www.indexinsuranceforum.org).

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36572 - August 2018