MicroInsurance Centre at Milliman

GREEN DELTA INSURANCE

Making Climate Risk Microinsurance Work

CASE STUDY

Green Delta Insurance Company (GDIC), Bangladesh

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Strategic Need

Bangladesh is geographically situated in Asia's largest delta formed by the Ganges, Brahmaputra and Meghna rivers. Two-thirds of the country is less than five meters above sea level (see *Figure 1*), which, according to some studies, puts about 70% of the country's population at risk of flooding[1]. The infiltration of salt water into farmland also threatens the viability of farming rice, the main crop. In addition, Bangladesh's high levels of poverty and population density exacerbate natural disasters and make its residents particularly vulnerable to them. The World Risk Index 2019 ranks Bangladesh as the 10th most at-risk country.[2]

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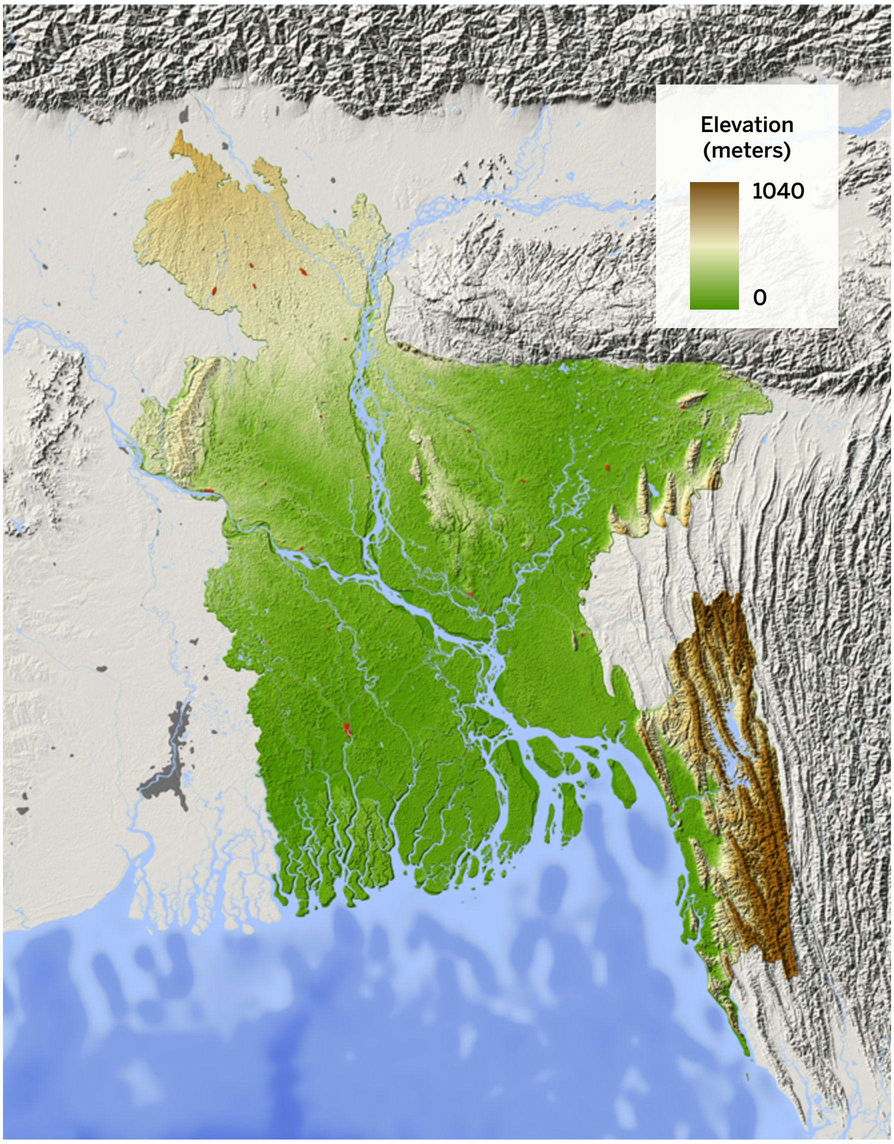
Figure 1: Topographic Map of Bangladesh [3]



Agriculture employs nearly two-thirds of Bangladeshis, making it one of the country's most important sectors and rice is the staple crop. The agricultural sector's performance has a major impact on Bangladesh's key macroeconomic indicators. In 2019, the contribution of agriculture to the national gross domestic product (GDP) was 12.7%.[4]

Agriculture insurance is at a nascent stage in Bangladesh. In 1977, the public insurer Sadharan Bima Corporation (SBC) piloted an individual-grower multiple peril crop insurance (MPCI). Subsequently, SBC piloted livestock and aquaculture insurance programmes in 1981 and the mid-1990s, respectively. However, by 1995, all three initiatives had been discontinued due to poor underwriting results and lack of demand. Following the termination of these SBC programmes, none of the insurance companies operating in Bangladesh were willing to provide agricultural insurance for nearly two decades.[5]

This combination of the country's topography, the importance of the agriculture sector and the protection gap has created an opportunity for insurers in Bangladesh to address climate-related risks through innovative insurance products that address some of the prior challenges.

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[1] Research Program on Water, Land and Ecosystems (November 2020). Challenges and potential solutions to social inclusion in an aggregator model to promote weather index insurance in Bangladesh. Technical Brief. Retrieved 31 May 2021 from https://cgspace.cgiar.org/bitstream/handle/10568/110361/WLE%20Brief%2029_Aggregator_Model_Bangladesh%20FINAL.pdf?sequence=1&isAllowed=y

[2] The WorldRiskIndex calculates the risk of disasters arising from earthquakes, cyclones, floods, droughts or sea level rise, based on a model that considers 27 indicators measuring a country's exposure and vulnerability (level of susceptibility, coping, adaptation). See http://weltrisikobericht.de/english/#data

[3] For more information see https://www.researchgate.net/

[4] World Bank. Agriculture, forestry, and fishing, value added (% of GDP) - Bangladesh, 1960-2019. Retrieved 31 May 2021 from https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=BD

[5] World Bank. Bangladesh: Agricultural Insurance Situation Analysis. Retrieved 31 May 2021 from http://documents1.worldbank.org/curated/fr/283721544525997951/pdf/132837-WP-10-12-2018-15-49-40-BangladeshAgricultureInsuranceSituationAnalysis.pdf

Origin, Objectives & Overview of Green Delta's Climate Risk Initiatives

Green Delta Insurance Company Limited (GDIC) is one of the largest general insurance companies in Bangladesh. It started operations in 1985 and has been a preferred partner to the government and international agencies in delivering universal healthcare schemes, improving gender equality and piloting other innovative nationwide programmes. Recognising the impact of weather and the effects of climate change on the lives of its fellow Bangladeshis, GDIC entered the climate risk insurance space in 2015 to help marginal farmers better manage their risks. Its efforts began as a corporate social responsibility (CSR) initiative. However, the team realised that, to offer solutions at scale, it would need to have a sustainable operation. Pre-COVID-19, GDIC was on the path to achieving breakeven by 2025.

Given the nascency of climate risk insurance in Bangladesh, GDIC adopted an experimentation mindset to explore multiple product categories, risks and types of partners. Starting in 2015, it introduced weather index-based crop insurance[6], followed soon after by flood insurance and livestock insurance. ***Figure 2*** shows the timelines and partners that have helped GDIC explore multiple product categories in climate risk insurance.

Of these, we will examine in detail its first and biggest portfolio, weather index-based crop insurance (WIBCI). The table in ***Figure 3*** provides an overview of this category of products.

Figure 2: GDIC's Timeline in Climate Risk Insurance[7]

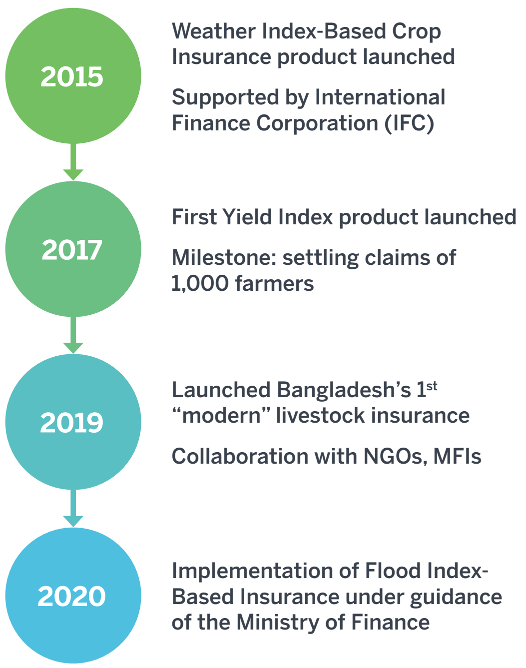


Figure 3: Overview

Policy Terms	2016	2017	2018	2019	2020
Premium rate (% of sum insured)[8]	**8.5%**	**7.5%**	**7.4%**	**6.3%**	**5.8%**
RISKS COVERED[9]					
Wet Spell	●	●	●	●	
Excessive Rainfall	●	●	●	●	●
Cold Spell	●	●	●	●	●
Dry Spell		●		●	●
Sunshine Hour (late blight)			●		
Temperature & Humidity				●	●
CROPS COVERED[10]					
Cassava	●				
Tomato	●	●	●		
Cucumber		●	●	●	
Bitter Gourd		●	●	●	
Industrial Potato			●		
Potato			●	●	●
Boro Rice				●	●
Aman Rice				●	●
Generic Crop				●	
Multi-Crop[11]					●
Winter Vegetable					●
SEASONS COVERED					
Winter	●	●	All Seasons (one product covers farmers for the entire year)		
Summer	●	●			
Rainy Season	●	●			
Voluntary/mandatory	**Voluntary**				
Bundling	**No**				

[6] As the name suggests, a weather index-based insurance product cover farmers against damages caused by weather events. It pays out based on an index, such as rainfall or temperature, measured by satellites or weather station.

[7] GDIC. Agriculture Insurance: Agriculture Scenario of Bangladesh. Retrieved 31 May 2021 from https://green-delta.com/products-services/agriculture-insurance/

[8] These premium rates are an aggregate of premium rates across all products offered by GDIC under the WIBCI category. Each product can cover one or multiple risks. Over time, in order to make the products more affordable GDIC reduced premium rates by reducing the number of risks covered or by adjusting the trigger in each product.

[9] Comprehensive list of risks covered, not necessarily in each product.

[10] Crops covered have changed over time depending on requirements of partners and their farmers. Typically, partners prefer to insure only the crops that are more prone to weather damage.

[11] Multiple crops covered including rice, potato, eggplant, pumpkin, bottle guard, chillies, ladies finger, betel leaf, radish, cauliflowers

Pricing

GDIC prices products on an actuarial basis without subsidies because it cannot sustain subsidies in the absence of government support. GDIC believes that short-term premium subsidies from the government are harmful to the interest and affordability of the farmers.

To determine the appropriate price and benefit levels, GDIC conducts in-depth research and ability-to-pay exercises with each partner and local communities to design affordable and customised products. With experience and experimentation, it has gradually increased the types of risks and varieties of crops as well as seasons covered within its weather index portfolio. It currently offers products that cover farmers year-round, thereby reducing the operational hassle of contracting multiple times a year.

CHALLENGE:
BALANCING AFFORDABILITY AND VALUE

It is difficult to design a product that is simultaneously affordable and meaningful for a population with limited means. At times GDIC has had to design a very low-premium product, resulting in very low amounts or frequencies of payout (or both). In many cases, GDIC is offering the product to farmers with very small landholdings (about 0.2 ha) and pays very small amounts in claims. This is largely for distribution partners that wanted their customers to experience the concept of insurance while still paying a very small, affordable premium.

Voluntary Programme

While GDIC sells group policies through partner organisations, all its products are voluntary and not bundled with other financial or nonfinancial products, primarily due to regulatory constraints. In Bangladesh, to bundle insurance with a loan, the insurance product needs to be approved not just by the insurance regulator but also the banking regulator that oversees lending.

INSIGHT:
EFFORT VS EFFECTIVENESS

Voluntary sales require a higher initial sales effort. However, it reduces the chances of mis-selling and ensures customers who have bought the product know they are insured (addressing a common problem with microinsurance products). If customers like what they bought and how it was serviced, it also reduces the effort required to renew their policies.

Delivery Model

GDIC has adopted a business-to-business-to-consumer (B2B2C) distribution model by partnering with organisations that provide support to farmers through various stages of crop production, and reaching their client bases through group policies. The table in *Figure 4* provides details about the partners involved in GDIC's WIBCI programme, including the multiple international agencies that have helped it set up the climate risk practice.

Figure 4: Partners

Partners	2016	2017	2018	2019	2020
DONOR ORGANISATIONS					
International Finance Corporation	●	●	●	●	
UK Aid	●	●	●		
USAID	●	●	●		
DISTRIBUTION CHANNELS					
Input Suppliers	●	●	●	●	●
Contract Farming Companies	●				●
Farmer Hubs			●	●	●
Social Enterprises			●		
MFIs				●	●
NGOs				●	●
Agricultural Input Seller					●
REINSURERS					
Swiss Re	●		●	●	
Nepal Re	●	●	●	●	
Bhutan Re	●	●	●		
WAICA Re				●	
CICA Re				●	●

Donor support

IFC, a part of the World Bank Group, has been instrumental in helping GDIC enter the climate risk insurance space. It provided technical assistance in index product design and actuarial support for pricing. It also helped set up a weather data grid, providing a spatially smooth source of interpolated weather data (rainfall and temperature) for every 10 sq km of Bangladesh. This weather grid has been crucial to providing the data required to design and price weather index products. IFC extended support to GDIC for a five-year period from 2015 to 2019.

UK Aid and USAID helped provided operational aid from 2016 to 2018, and USAID also helped connect GDIC to distribution partners such as input sellers.

INSIGHT:
SUSTAINABILITY AND SUBSIDY

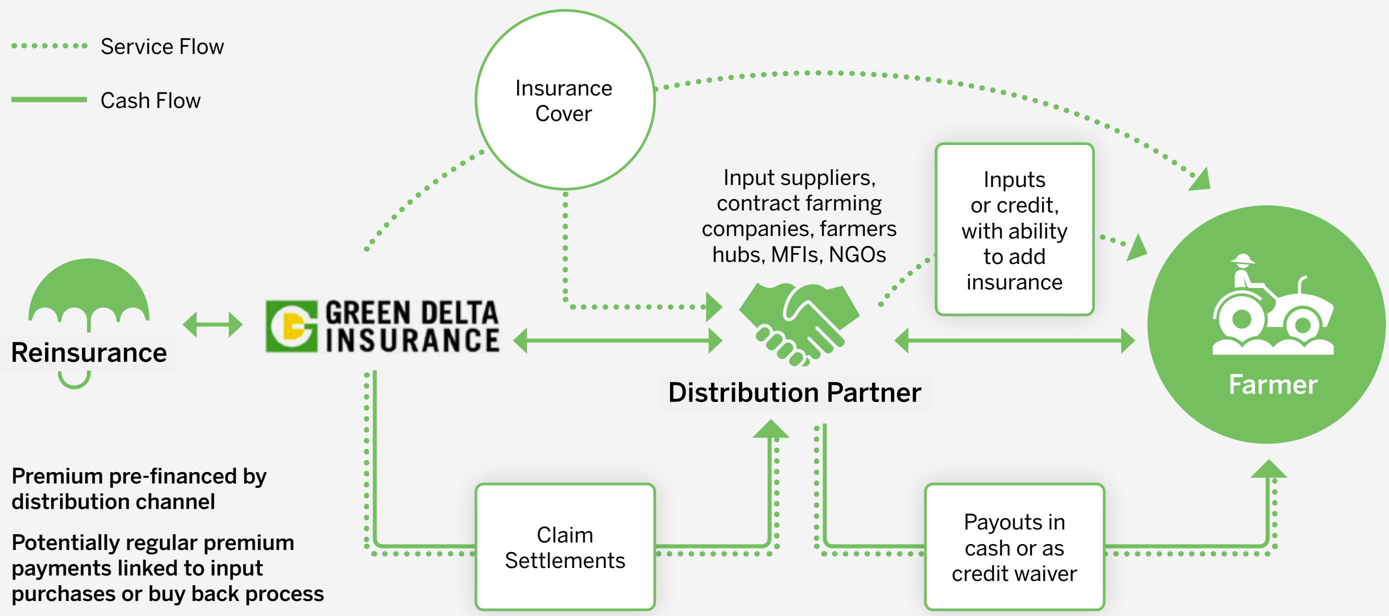
GDIC's approach has been to use donor support as an indirect subsidy to cover some of the up-front investments necessary to build a sustainable climate insurance programme. Funding was used to build capacity, infrastructure and access to markets, thereby creating a sustainable environment for delivery of climate risk products. The donors and GDIC have ensured that funding isn't used for direct premium subsidies, because they believe it will not be a sustainable approach in the long run in the absence of government subsidies. There is an increased interest of government in implementing crop insurance throughout the country, which gives a light of hope to solve the pricing issue, if it offers a subsidised crop insurance programme.

In 2016 GDIC partnered with two organisations, and has scaled up to 15 partners in 2020

Distribution channels

In line with its test and learn approach, GDIC reaches farmers through a wide variety of organisations that provide support to farmers during crop production, such as contract farming companies, farmer hubs, microfinance institutions (MFIs), nongovernmental organisations (NGOs), input sellers, etc. In 2016 GDIC partnered with two organisations and has scaled up to 15 partners in 2020. This distribution model is shown in ***Figure 5.***

Figure 5: Distribution Model



The product and delivery methodology are customised to each of the partners' business models. To ensure product-market fit, GDIC conducts focus group discussions (FGDs) with customers of every new partner. These FGDs play a substantial role in product design by offering the views and opinions of local farmers. GDIC uses these insights along with available data and statistics to customise products for each partner organisation and to cover relevant risks, crops and seasons at a premium that is affordable to the client base.

INSIGHT:
ASSESSING FEASIBILITY AND NEEDS

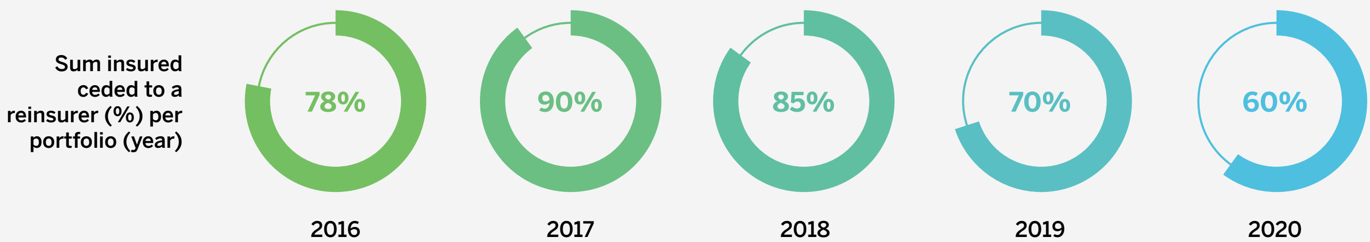
GDIC conducts thorough due diligence with potential partners to ensure there is a strategic alignment between the two organisations and to understand how farmers perceive the partner organisation. It then conducts in-depth needs assessment and ability-to-pay exercises with the farmers before designing products.

GDIC's partnerships with NGOs have been most successful to date, accounting for over 70% of premiums and 80% of customers. It believes this success is mainly due to the credibility and trust gained by the NGOs through prolonged periods of work in a region. Many NGO partners also offer microfinance services, which offer the perfect opportunity to cross-sell insurance. These two factors have helped GDIC ensure that customers are given regular trainings on the index insurance product, thereby building familiarity and understanding.

Reinsurers

As can be seen in ***Figure 4*** above, there has been a constant change in reinsurance arrangements since inception. This is due to the fact that GDIC's WIBCI portfolio is still too small for it to directly approach a reinsurer. Hence, GDIC works with a reinsurance broker that places the portfolio with multiple reinsurers as per GDIC's requirement and reinsurers' interest. GDIC believes that it needs another two to three years before its portfolio is big enough for a more concrete and strategic reinsurance arrangement. Over the past five years, GDIC has reinsured 73% of the portfolio (in aggregate) with several reinsurers.

Figure 6: Reinsurance



27%

risk retention by GDIC on average over the last 5 years

INSIGHT:
APPROPRIATE RETENTION LEVELS

GDIC noted that during the initial pilot period of three years, the company retained only a small portion of the sum insured to reduce shocks of large losses. With time, it is increasing its retention, as can be seen in the table in Figure 6. In 2020, it had a quota share arrangement with 40% retained. Going ahead, it plans to retain 20% to 40% of the sum insured to be able to gain experience, without taking on too much risk on its books.

Performance

The efficacy of a crop insurance programme can be measured using three parameters:[13]

1. Coverage
2. Client Value
3. Sustainability

1. Coverage

As can be seen from the table in ***Figure 7,*** the WIBCI programme is still small, but growing substantially year on year. In the first five years, GDIC has insured a total of around 50,000 farmers under WIBCI and 100,000 farmers across WIBCI, area yield and flood index products. While this is a very small fraction of the farmer base in Bangladesh, a year-on-year growth of about 400% is a good scale-up for a programme run by a private insurer offering voluntary insurance without any subsidy. The team intends to grow fivefold by 2025 and cover 500,000 farmers under its climate risk portfolio.

In 2019, despite the increase in number of partners, there was a reduction in total sum insured and area insured (and, correspondingly, a reduction in premium). This is due to the move to towards partnering with more NGOs, many of which serve a significant portion of women clients with smaller amounts of land farmed. The likes of Syngenta Foundation, one of GDIC's partners, are trying to get Bangladeshi farmers to experience insurance through very small ticket-size products. The hypothesis is that once these farmers experience the benefits of insurance, they would be willing to pay higher premiums and get more meaningful coverage.

50,000
farmers insured under WIBCI

100,000
farmers insured across WIBCI, area yield and flood index products

400%
year-on-year growth

Figure 7: Performance

Portfolio	2016	2017	2018	2019	2020
Total number of policies sold[14]	2	4	11	24	15
Total number of clients covered	251	3,200	5,652	9,775	32,355
% women clients	30% - 40%	30% - 40%	30% - 40%	30% - 40%	30% - 40%
Total annualised gross collected premiums (USD)	2,609	11,280	22,230	7,402	25,342
Net premiums retained by GDIC (USD)[15]	574	1,128	3,334	2,221	10,137
Average premium per client (USD)	10.39	3.53	3.93	0.76	0.78
Total annualised sum insured (USD)	30,712	150,908	301,065	118,395	435,127
Average sum insured per client (USD)	122	47	53	12	13
Total area insured (hectares)	73	259	481	137	465
Average area insured (hectares)	0.29	0.08	0.09	0.01	0.01

[13] Arman Oza (December 2020) - The Insurance Times

[14] GDIC sells policies at a group level. Each policy covers multiple clients belonging to a geographical area of a distribution channel.

[15] Net premium = gross premium net of reinsurance

2. Client Value

The intrinsic value of a crop insurance product lies in the extent and spread of financial protection it offers to farmers from the pool created through collection of premiums. These values can be assessed through the claims ratio (ratio of claims paid to premiums collected) as well as the claims incidence (proportion of farmers receiving payouts as against the total number of farmers insured).[16]

Figure 8 shows the claims ratio and incidence rate of the WIBCI portfolio since inception. There is wide variance in claims ratio year-on-year, in accordance with the weather each year (e.g., 2018 and 2020 were good years from a climate perspective). The five-year aggregate claims ratio is at 48%, with claims incidence of 45%. Both these indicators suggest good value for the customer – almost one of every two customers has received a claim payment and thus experienced insurance in a tangible way, and despite the high frequency of payouts (and thus higher operational expenses as seen later in the combined ratios), GDIC has still managed to provide a relatively high claims ratio.

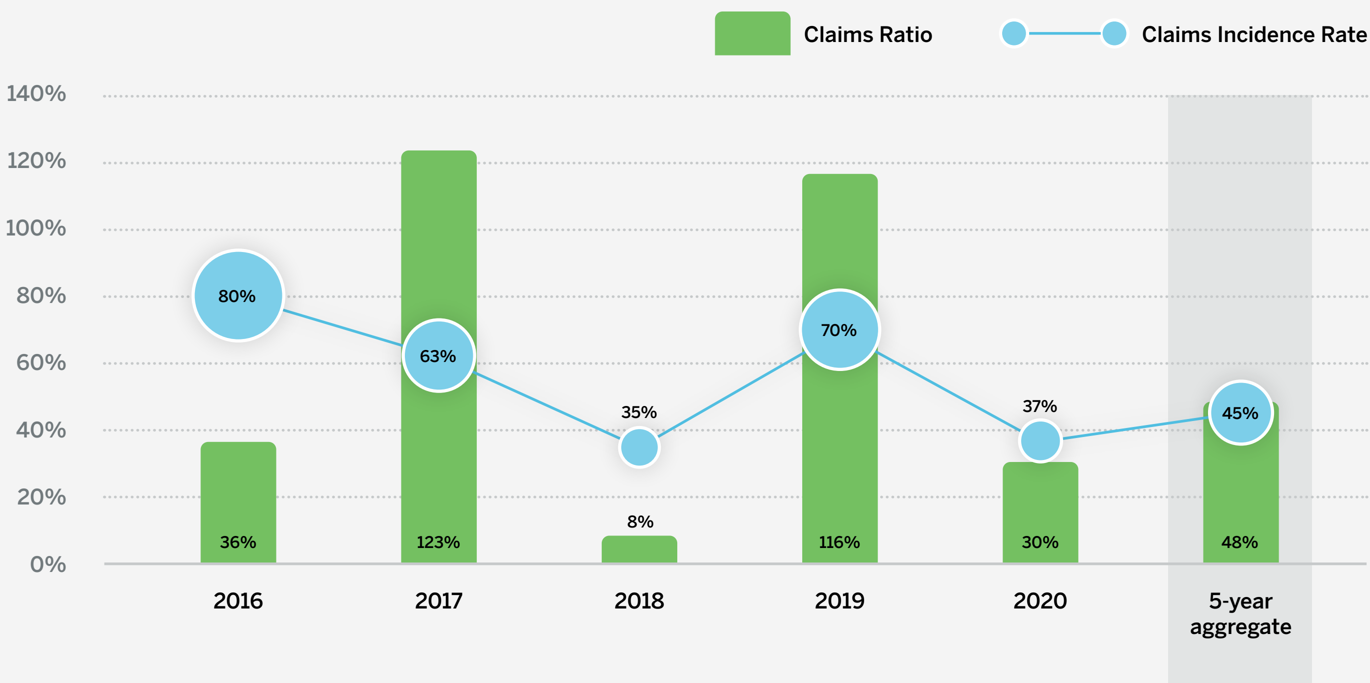
48%

five-year aggregate claims ratio

45%

five-year aggregate claims incidence rate

Figure 8: Claims Ratio and Incidence Rate



The table in ***Figure 9*** shows details of GDIC's claims experience under the WIBCI portfolio. The average claim amount, which was already relatively low, has dipped significantly since 2018, to a low of USD 0.64. As noted earlier, this is the result of the increase in number of NGO partners, whose customers have lower ability to pay, and led to products with lower coverage amounts (and therefore lower payouts). Green Delta opted for a higher claims incidence rate to ensure as many people saw tangible value from the product as possible, even though that meant smaller individual payout values.

CUSTOMER FEEDBACK

According to GDIC "feedback from customers is good so far. They find the payouts useful even though it is less than USD 1, because they pay a very minimal amount as premium and, as a result, they do not expect to receive high payouts. Our journey with MFIs is only a few years old, so it's hard to comment on the trend of expectations of the beneficiaries. But, as of now, we haven't received any negative feedback from the beneficiaries either directly or via distribution partners." A year-on-year growth of about 400% could be testimony to the value customers see in the products offered.

[16] Arman Oza, op cit.

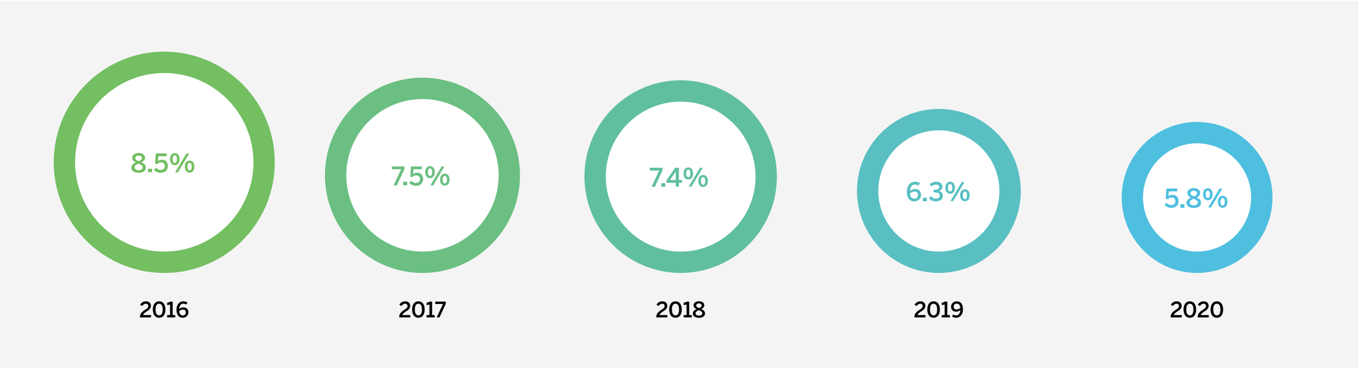
Figure 9: Claims Experience

Claims Experience	2016	2017	2018	2019	2020
Number of paid claims	200	2,000	2,000	6,856	11,905
Average claim amount (USD)	4.7	6.9	0.9	1.3	0.64
Total amount of claims paid (USD)	943	13,829	1,725	8,587	7,678

Another parameter that is important from a value perspective is affordability. Farmers need to be able to afford the premiums to see the value of insurance. The majority of crop insurance schemes overcome this obstacle by offering subsidies. In the absence of subsidies, GDIC has had to tweak its premium rates to customise them to different partners and customers as well as by affordability.

As can be seen in ***Figure 10,*** the premium rates show a constant downward trend. Earlier products used to cover multiple perils, resulting in higher premium, whereas after partnering with NGOs, more products have been priced to cover fewer perils to make them affordable to customers.

Figure 10: Premium Rates



3. Sustainability

A crop insurance programme's sustainability depends on whether there is reasonable profit for insurers and distributors on one end, and clear value for farmers on the other.

Combined ratios of the scheme are a good measure of profitability for insurers because they consider all the outflows (expenses and claims) and inflows (premium). GDIC manages all its crop insurance schemes—WIBCI, area yield index and flood index products—as a portfolio, hence expense data are only available for the entire crop insurance portfolio. The ratios presented in the table in ***Figure 11*** are therefore based on the entire portfolio. Although initially very high, they show a steady downward trend. GDIC noted that many costs incurred in the initial years, such as office setup and equipment for employees, are startup costs that need to be seen as investments required in the initial stages of the programme. It expects these costs to reduce with time, bringing down the combined ratios. And as scale continues to grow, these fixed costs will be spread across more policyholders, further reducing the combined ratio.

Figure 11: Combined Ratios for GDIC's Entire Crop Insurance Portfolio

Year	Claims Ratio (claims/premium)	Expense Ratio (expenses/premium)	Estimated Combined Ratio (claims+expenses / premiums)
2016	36%	2124%	2160%
2017	104%	648%	752%
2018	7%	438%	445%
2019	81%	281%	362%
2020	86%	108%	194%

Key Learnings

While GDIC initially developed its climate insurance portfolio with social motivations, it is finding ways to grow it into a sustainable business case. Some key lessons for how it is doing so include:

01

Testing and learning

GDIC has adopted an experimentation mindset to learn what customers want and how to deliver it sustainably. In many cases, this has meant offering products that pay out small amounts more frequently, to build up experience and demand.

02

Investing patient capital

While GDIC management is clear about building a sustainable climate programme, it has not put immediate pressure on profitability and given the team a 10-year runway to achieve breakeven.

03

Leveraging donor support in a sustainable way

Using assistance from international agencies to build capacity, infrastructure and access to markets, rather than for short-term incentives.

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