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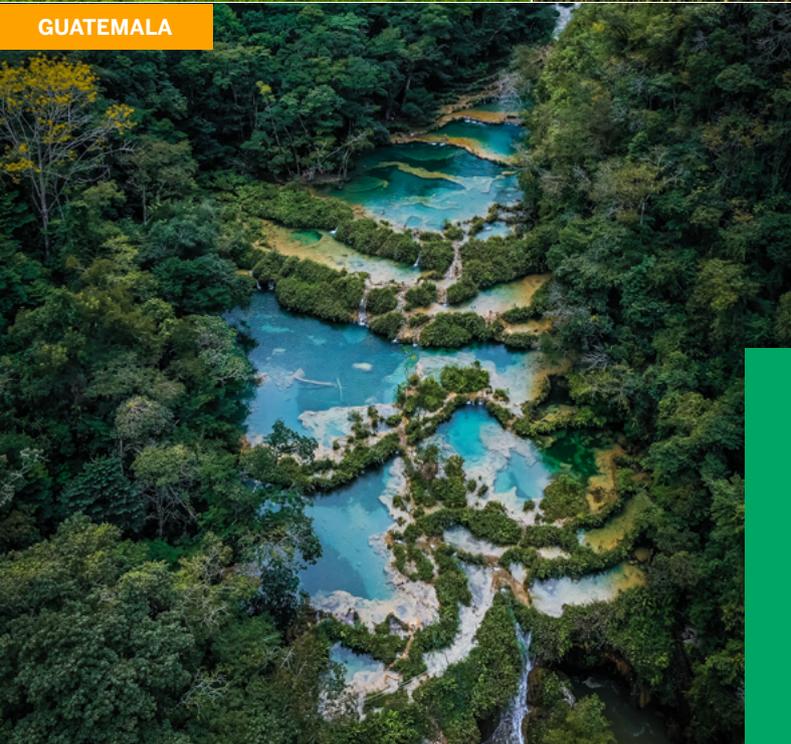
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Making Climate Risk Microinsurance Work

RESEARCH REPORT

An analysis of five cases of climate
risk microinsurance

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Abbreviations

AR	Aseguradora Rural
CSR	Corporate social responsibility
FGD	Focus group discussion
GDIC	Green Delta Insurance Company
IADB	Inter-American Development Bank
KAIP	Kenya Agriculture Insurance Program
MiCRO	Microinsurance Catastrophe Risk Organisation
MIC@M	MicroInsurance Centre at Milliman
MFI	Microfinance institution
NGO	Non-Governmental Organisation
PCIC	Philippine Crop Insurance Corporation
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)
PPP	Public private partnerships
SDA	Swiss Development Agency
SGIC	Sanasa General Insurance Company
UAI	Unit area of insurance
USD	United States dollars
WIBCI	Weather index-based crop insurance

Executive Summary

Climate change disproportionately affects low-income and vulnerable populations around the world. Climate risk microinsurance is a risk transfer solution that aims to protect these populations against the negative impacts of extreme weather events that are becoming more frequent and more severe due to climate change. We believe the private sector can and should play a key role in climate risk microinsurance, but in the absence of clear examples and information they are often hesitant to do so.

To help risk carriers and other relevant stakeholders learn more about real-world solutions, the MicroInsurance Centre at Milliman collaborated with senior management from five different programs (see sidebar) to develop case studies about their journeys to building a viable climate risk microinsurance solution. This report compiles the results from the individual case studies in an attempt to provide key insights and trends for insurers, reinsurers, governments and donor groups to shape successful climate risk insurance programs that focus on low-income populations.

Each of the programs studied provides coverage directly to low-income households to protect their crops or businesses against one or more climate-related risks. Three of the programs (GDIC, SGIC, and AR/MiCRO) are driven by the private sector (with donor support), while the other two (PCIC and KAIP) include significant government involvement. All of the insurers had a common motivation of some form of corporate social responsibility—improving the resilience of target low-income populations. However, nearly all also had secondary motivations relating to strengthening their business, either directly or indirectly.

Some trends in how insurers approached climate risk microinsurance include:

■ Strategic approach

Each institution took a unique approach to fit climate risk insurance within their own context and organisational strategy, but common themes emerged, such as visible support from the top, taking a client-centric approach, and having an experimentation and learning mindset.

■ Payout structure

Voluntary programs used a payout strategy of small but frequent payouts to build trust early on, but most insurers are opting for a more typical and sustainable low-frequency, high-value payout structure.

■ Managing claim ratios

Providers used product design modifications and promoted holistic risk management solutions in order to reach sustainable claim ratios in the short and long term.

■ Use of donor support

Private programs kept expense ratios low by utilizing donor funding as an indirect subsidy to support up-front costs such as capacity building, product design and technology.

■ Reinsurance

Reinsurers are the backbone of climate risk microinsurance, bearing most of the risk and providing support for local insurers.



Green Delta Insurance Company (GDIC), Bangladesh

Weather index crop insurance



Sanasa General Insurance Company (SGIC), Sri Lanka

Indemnity-based crop insurance



Aseguradora Rural (AR) / MiCRO, Guatemala

Weather/earthquake index insurance



Philippines Crop Insurance Corporation (PCIC), Philippines

Indemnity-based crop insurance



Kenya Agriculture Insurance Programme (KAIP) with APA, Kenya

Indemnity-based crop insurance

■ Government subsidies

Premium subsidies by government are clearly linked to higher scale but are subject to government budgetary constraints.

■ Role of government

Key roles include providing a mandate to address market gaps in serving low-income populations, allocating funding and working in partnership with private sector to deliver services.

■ Use of technology

Insurers use a variety of front- and back-end technology to reduce costs.

■ Distribution

Insurers seek strategic alignment with distribution partners, with a focus on financial institutions.

Each of the programs studied took a different approach, and none has found a clear formula for success, but each is actively learning and adjusting on their journey to sustainability.

Each program is actively learning and adjusting on their journey to sustainability.

1. About ‘making climate risk microinsurance work’

The problem – climate crisis and the impact on vulnerable populations

Climate change disproportionately affects low-income and vulnerable populations around the world who typically have higher exposure and thus greater vulnerability to climate impacts and fewer humane adaptation and coping mechanisms available to them. The World Bank estimates climate change could lead to an additional 100 million people living in poverty by 2030¹. For many low-income populations, climate risks impact agricultural livelihoods, as well as businesses, health and mortality.

An important tool – climate risk insurance

As a method of pooling and transferring risks, insurance has an important role to play in comprehensive climate risk management. Donors, development banks, insurers and governments are increasingly looking for ways to mitigate the effects of climate change, particularly for low-income populations. There are a number of initiatives, largely supported by major donors, which seek to increase the availability of climate risk insurance for low-income populations, including the InsuResilience Global Partnership, the Insurance Development Forum, the German Government (BMZ), the Munich Climate Insurance Initiative, the United Nations, the World Bank Group and many others.

What is climate risk microinsurance?

According to BMZ, the German Federal Ministry for Economic Cooperation and Development, ‘Climate risk insurance improves people’s protection against climate-related loss and damage, thus strengthening their financial resilience against the negative impacts of climate change.’² Microinsurance generally refers to insurance products that have been designed to meet the specific needs of low-income populations. We therefore combine these to generally define climate risk microinsurance as ‘risk transfer solutions that aim to help low-income populations to manage the negative impacts of extreme weather events,’ as discussed in **Box 1**. Climate risk (micro)insurance may apply either a parametric (index-based) coverage, or a more traditional indemnity-based approach (see **Appendix 1: Glossary**).

BOX 1: CLIMATE RISK MICROINSURANCE DEFINITION FOR THIS STUDY

Climate risk microinsurance is risk transfer solutions that aim to help low-income populations to manage the negative impacts of extreme weather events[^] that are becoming more frequent and more severe due to climate change.*

*For this study, we focus on negative impacts of climate risks relating to agriculture, property, or business, e.g., crop damages or losses, livestock losses, other property damage or loss, business interruption, etc.

[^]Extreme weather events may include drought, flood, high winds, cyclones, frost, or hail, among others.

1 World Bank (November 2015). Rapid, Climate-Informed Development Needed to Keep Climate Change from Pushing More than 100 Million People into Poverty by 2030. Retrieved 30 November 2022 from: <https://www.worldbank.org/en/news/feature/2015/11/08/rapid-climate-informed-development-needed-to-keep-climate-change-from-pushing-more-than-100-million-people-into-poverty-by-2030>

2 BMZ (2022). ‘Climate risk insurance.’ Webpage retrieved November 2022 from: <https://www.bmz.de/en/issues/climate-change-and-development/climate-risk-insurance>

Why this research?

WE BELIEVE THE PRIVATE SECTOR CAN AND SHOULD PLAY A KEY ROLE IN CLIMATE RISK MICROINSURANCE.

While the interest in climate risk insurance for low-income populations is encouraging, private sector players such as insurers and intermediaries have limited resources, in terms of available information and know-how, to support them in offering climate risk microinsurance. Without clear examples and data, insurers often face doubt and uncertainty, which influences their decision not to support low-income populations in mitigating their risks from climate change.

KNOWLEDGE AS A FIRST STEP TO DEVELOPING CLIMATE RISK INSURANCE SOLUTIONS.

To help risk carriers and other relevant stakeholders learn more about real-world solutions, the MicroInsurance Centre at Milliman collaborated with five different programs to develop case studies about their journeys to building a viable climate risk microinsurance solution. In each of these case studies, we take an in-depth look at the strategic need and country climate context, the objectives of their climate initiatives, the delivery model, programme performance and key learnings. In particular, we try to assess whether and how such programs sustain themselves.

Why this report?

In this report, we compile the results from the individual case studies in an attempt to provide key insights and trends for insurers, reinsurers, governments and donor groups to shape successful climate risk insurance programs that focus on low-income populations. The practices and examples presented in this research report are intended to support insurers to build their own climate risk microinsurance programs.

Study methodology

CASE SELECTION

The study began with a literature review to identify programs meeting a number of criteria, as shown in **Box 2**. We intended to focus on Asia, and also included cases from other regions for comparison. More than 20 potential case study programs were identified at this stage, which were further reduced to 11 (see **Appendix 3**). From these, we retained five cases which were able to provide five years of data (to allow for more substantive trends), and for which the insurers were willing and able to provide data and information regarding their experience.

DATA COLLECTION

Once the case studies were identified and the organisations agreed to participate in the study, they were provided with a data collection form (see **Appendix 4**). The objective was to collect the underlying financial data of their climate risk products and identify the specific climate risk product or business line on which to focus.

Data since inception of the climate programme was collected, checked for any significant errors, and analysed for the period 2016 to 2020. This included assessing trends with derived data points such as average premiums, average sum insured, year-on-year growth, aggregate claims ratios, claims incidence trends and more. A series of in-depth, one-on-one discussions with teams from participating organisations were held to validate and discuss the data analysis, as well as learn and document their stories, struggles, successes and failures. The participating organisations were contacted between January and July 2021. The case studies were written up based on insights drawn from the quantitative data as well as the qualitative information provided by the organisations.

STRUCTURE OF CASE STUDIES

The case studies are organized along the following topics:

■ Strategic need

Highlights the climate vulnerability of the country(ies) under consideration and factors that exacerbate climate risks.

■ Objectives and overview of the insurer's climate risk initiatives

Introduces the reader to the organisation, its motivations for pursuing a climate risk microinsurance programme and the product being covered in the case study.

■ Delivery model

Focuses on the way the organisation delivers insurance to end clients, the partners involved, and the roles played by each partner. (See **Box 3**)

■ Performance

Evaluates the efficacy of the programme according to outreach (number of clients), claims (loss and incidence ratios) and sustainability (combined ratios).

■ Key learnings

Highlight the organisations' key learnings through their journey in climate risk microinsurance.

Links to the individual case study publications are provided in **Appendix 2**.

BOX 2: CRITERIA USED FOR CASE SELECTION

- ✓ Covers climate risks
- ✓ Targets low-income populations
- ✓ Reaches low-income households directly (not meso- or macro-level insurance)
- ✓ At least three, and preferably five, years of experience
- ✓ Operating in a developing market

BOX 3:
ACTORS AND THE ROLE THEY PLAY IN CLIMATE RISK MICROINSURANCE

While our study focused on insurance companies, we gained insights into the roles played by a variety of stakeholders to make it possible for a climate risk microinsurance product to be delivered to the low-income end client. We take a brief look at them here.

Insurance companies: During our study, we noted distinct roles which private insurance companies are playing in the climate space. In the case of KAIP, the government sought private participation to deliver its climate insurance program. But in countries without a strong government-led crop insurance program, we see private insurers take the lead in delivering solutions directly to end-clients with assistance from reinsurers and donors (GDIC and SGIC). Given the nature of climate risks, we also see some of them starting off as fronting companies (AR/MiCRO) and retaining more risk as they get more experience.

Reinsurance companies: Reinsurers are the backbone of most of the climate risk microinsurance programs we evaluated. The size and uncertainty of climate risks require significant resources, technical investment and global capital facilities that only reinsurers possess. Reinsurers' wealth of information on natural catastrophes, regional or global presence, and their ability to underwrite risks that are new or too big for local insurers are enabling factors for many climate risk microinsurance programs. We noted a prominent level of reinsurance (up to 100% of risk ceded) in all our case studies, with the exception of the Philippines case (PCIC), where the government agency running the programme self-insures with government funds.

Technical assistance providers: Technical assistance providers are a new breed of companies, typically technology-led, that have emerged in recent years. Companies like Pula (KAIP) and MiCRO (Aseguradora Rural) bring international expertise during all phases of the project, including conception, demand and supply analysis, product

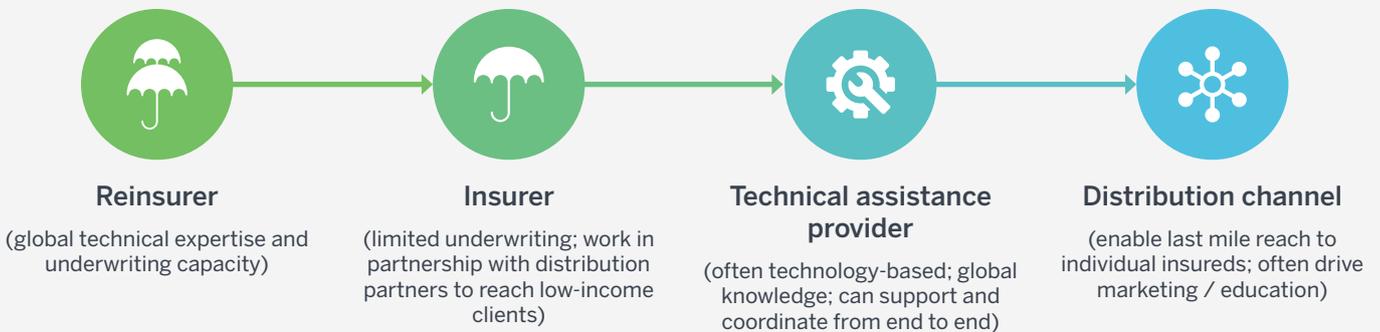
design, pricing, launch and monitoring. They can manage entire climate insurance programs, bringing in necessary partners and administering the programme for a fee. Their specialization in the climate space seems to make them a dependable partner to insurers and reinsurers.

Distribution channels: Distribution channels play a critical role in helping private insurers deliver micro-level solutions to end clients. They enable last-mile reach in the absence of government agencies. These distribution channels range from input suppliers to contract farming companies, MFIs, NGOs, banks or other organisations which aggregate low-income people. In some cases, these distribution channels may also serve as the 'information campaign' and educators that drive participation rates that insurers and reinsurers need.

Governments: Governments in the developing world are often the first line of aid that people look towards following a climate event. It is no surprise that governments will play a major role in the creation, funding and implementation of most climate insurance schemes. During our study, we noted that where governments were involved in delivering micro-level schemes directly to farmers and other end-clients, they played a crucial role in achieving scale. Coupled with premium subsidies and higher outreach by leveraging government-linked distribution channels such as extension workers, these programs can achieve scale much faster than products delivered by the private sector.

Donor organisations: Donor organisations have been instrumental in supporting climate risk insurance, particularly for low-income populations. In most of our case studies, donors supported the programs by helping build capacity, infrastructure and access to markets. Their support functions as indirect subsidies, which cover upfront development costs and create a sustainable environment for delivery of climate risk products.

Figure 1: Map of Key Actors in Climate Risk Microinsurance



Government: Can support or take the role of insurer, reinsurer and distribution channel. Also often provides support in the form of premium subsidy.

Donors: Funding and technical assistance from donors typically supports the final three actors in this value chain to build capacity, infrastructure and access to markets.

2. Overview of case studies

2.1. Country Contexts

The five programs studied are based in countries with varying climate and disaster risk features. All five are considered to be medium to very high risk, and ranked within the top 76 riskiest countries in 2022, according to **WorldRiskReport**, which 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).³ The specific climate risk microinsurance programs attempt to address the impacts of some but not all of these risks, among others. **Figure 2** shows the five cases and their country risk contexts.

2.2. Models Studied: Direct, Micro-Level Programs with a mix of Government Involvement

GOVERNMENT INVOLVEMENT

We see many different delivery models for climate risk microinsurance in action. In many developing countries, governments have taken the lead in providing climate risk solutions, in some they have partnered with the private sector, while in others, private insurers have taken the lead in the absence of government programmes. We include programmes with and without government involvement, in order to provide examples of the different models of climate risk microinsurance in the market and their business cases.

DIRECT VERSUS INDIRECT

Climate risk microinsurance models can also be classified based on whether target low-income households benefit *directly* as insureds who receive payouts themselves, or *indirectly*, by receiving payouts intermediated by another insured entity, such as an aggregator, or by the government. These can be described as micro-, meso- and macro-level programs (see **Box 4**). For this report, we focused on climate risk microinsurance programmes that aim to directly benefit low-income individuals (e.g., micro-level programmes).

BOX 4: LEVELS OF CLIMATE RISK MICROINSURANCE

(Reproduced from: Munich Climate Insurance Initiative, **“Making Climate Risk Insurance Work for the Most Vulnerable, Seven Guiding Principles”**)

Climate risk microinsurance can be implemented at three levels:

Micro-level (direct): Policyholders are individuals, e.g., farmers, market vendors or fishers, who hold policies and receive payouts directly. These policies are often sold at the local level and retailed through a variety of channels, including microfinance institutions, farmers' cooperatives, banks, NGOs and local insurance companies. Premiums are either paid in full by clients or subsidized.

Meso-level (indirect): Policyholders are risk aggregators such as associations, cooperatives, mutuals, credit unions or NGOs, whereby a (re-) insurer makes payments to the risk aggregators.

Macro-level (indirect): Policies are held by governments or other national agencies, within the international/regional reinsurance market. Payouts can be used to manage liquidity gaps, maintain governmental services or finance post-disaster programmes and relief efforts. These schemes can be operationalized through regional risk pools.

The five programs studied are based in countries with varying climate and disaster risk features and are ranked within the top 76 riskiest countries in 2022.

³ https://weltrisikobericht.de/wp-content/uploads/2021/09/WorldRiskReport_2021_Online.pdf

Figure 2: Case Studies and their Risk Context



LEGEND

Key risks in each country

- Cyclone/hurricane
- Drought
- Earthquake
- Flood
- Sea level rise
- Storm surge

Rank - World Risk Index Ranking in 2022 according to WorldRiskReport

2.3. The Cases

TABLE 1: SUMMARY OF KEY ACTORS AND THEIR PRODUCTS FOCUSED ON FOR THIS STUDY

	Insurer	Programme studied
Private-sector programs (no government involvement)	<p>Green Delta Insurance Company (GDIC), Bangladesh</p> <p>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.</p>	<p>Starting in 2015, GDIC introduced weather index-based crop insurance, followed soon after by flood insurance and livestock insurance. We focus on their earliest and biggest product: weather-index based crop insurance.</p>
	<p>Sanasa General Insurance Company Ltd (SGIC), Sri Lanka</p> <p>SGIC is a Colombo-based insurance company which launched as a subsidiary of Sanasa Life Insurance Company (previously Sanasa Insurance Company Limited, SICL) in 2019. It is affiliated with the SANASA movement—thrift and credit cooperative societies, to which around 20% of Sri Lankans are members.</p>	<p>SGIC (then call SICL) ventured into crop insurance in 2010 as a response to member needs. They started by offering weather index-based insurance for paddy rice, tea, and bananas; simultaneously, they ventured into indemnity-based comprehensive crop insurance. We focused on their biggest product; indemnity-based comprehensive crop insurance.</p>
	<p>Aseguradora Rural (AR) / MiCRO, Guatemala</p> <p>AR is an insurance company established in 1999, with operations in both life and general insurance. It is a fully owned subsidiary of Banrural, a large Guatemalan bank offering financial services in rural areas of the country. The Microinsurance Catastrophe Risk Organisation (MiCRO) was founded in 2011 by Mercy Corps and Fonkoze in Barbados in the aftermath of the 2010 Haiti earthquake. MiCRO develops and implements index-based inclusive insurance solutions to help microentrepreneurs and smallholder farmers cope with the effects of natural disasters. To do this, they engage with key local partners, including insurance companies (such as Aseguradora Rural) and microfinance institutions.⁴</p>	<p>In 2017, MiCRO and AR ventured into climate risk microinsurance with Esfuerzo Seguro, a weather and earthquake index-based insurance product offered to micro-entrepreneurs and smallholder farmers borrowing from Banrural.</p>
Programmes with government involvement	<p>The Philippine Crop Insurance Corporation (PCIC), Philippines</p> <p>PCIC started operations in May 1981 to provide insurance protection to agricultural producers in the Philippines, particularly subsistence farmers and fisherfolk. PCIC operates as a government-owned and controlled corporation under the auspices of the Department of Agriculture, with its operations decentralized to the regional level.⁵</p>	<p>While PCIC offers insurance coverage for rice, corn, livestock, high-value crops, non-crop agricultural assets, credit & life, and fisheries, we focused on rice and corn indemnity-based insurance for the case study, since they are the most significant products in the portfolio.</p>
	<p>Kenya Agriculture Insurance Program (KAIP) / APA</p> <p>KAIP was launched in 2015 by the Kenyan ministry of Agriculture, Livestock and Fisheries and the World Bank, targeting smallholder farmers growing maize. The programme works through a distinctive public private partnership model, with the private insurers organized as a consortium and working as one entity, rather than bidding against each other as is more commonly seen. The consortium is led by APA Insurance.</p>	<p>KAIP launched its first product in 2016, an area yield index insurance product targeting smallholder farmers, primarily covering maize. It is this product that we reviewed.</p>

Table 3 provides product details of the specific programmes studied in the five cases.

⁴ The Microinsurance Catastrophe Risk Organisation. Our Solution. Retrieved 30 November 2022 from: <http://www.microrisk.org/our-approach-our-solution/>

⁵ Philippine Institute for Development Studies. Crop Insurance Program of the Philippine Crop Insurance Corporation. Retrieved 13 July 2021 from <https://www.pids.gov.ph/publications/5878>

2.4. Motivations for venturing into Climate Risk Microinsurance

All of the insurers in the cases had a common motivation of some form of corporate social responsibility—improving the resilience of target low-income populations. However, nearly all also had secondary motivations relating to strengthening their business. This could be done by direct (small) profits in the long run, as the programmes break even and become sustainable. But more than

direct bottom line impacts, insurers' rationale focused on indirect benefits, such as investing in a future client base, improving their reputations, or building capacity and knowledge that can be leveraged elsewhere in the business. **Table 2** summarizes these motivations across programmes.

TABLE 2: MOTIVATIONS FOR OFFERING CLIMATE RISK MICROINSURANCE

	Corporate social responsibility	Invest in future client base	Capacity / knowledge	Reputation / visibility
GDIC	●			
SGIC	●	●		●
AR/MiCRO	●	●	●	●
PCIC	●			
KAIP/APA	●	●	●	

All insurers had a common social motivation of improving the resilience of low-income populations, but three insurers also had strong motivations related to strengthening their business.

- At the onset, SGIC thought of their crop insurance offering as a mix of CSR and business. They felt that even if crop insurance didn't make high profits, by building trust in insurance and building brand recognition among the rural communities, SGIC could cross-sell motor and other products.
- AR's mission is the comprehensive rural development of the country by providing financial services focusing on farmers, merchants, artisans and entrepreneurs who own micro, small and medium-sized companies. Their weather and earthquake index insurance product was aligned with their overall strategy, and they treated their climate risk initiative as a mix of CSR and business.
- In Kenya, the common motivation of the participating insurers was to insure vulnerable populations and increase resilience of Kenyan agriculture. The programme's consortium model has allowed the private sector to gain expertise and agriculture insurance capacity over time and has facilitated knowledge sharing. They have already built enough expertise to extend the model to Uganda. APA also sees the programme as an investment in developing a future client base.
- GDIC's approach is a bit unique in that it believes that in order to have the social impact they desire, the initiative has to be commercially sustainable. It entered the climate risk insurance space in 2015 as a CSR initiative to help marginal farmers better manage their risks, specifically the impact of weather and the effects of climate change on their lives. However, the team realized that, to offer solutions at scale, it would need to have a sustainable operation.
- PCIC, as a fully government-owned entity, is fully focused on providing fast post-disaster relief to farmers. Because rice and corn are staple crops in the Philippines, by mandate PCIC does not even price the insurance to cover their operational costs, only the cost of claims. However, PCIC is intended to self-sustain its operations, which it does primarily by diversifying its offerings with other product lines for which it can increase the premiums to cover operational costs.

TABLE 3: OVERVIEW OF PRODUCTS STUDIED IN THE FIVE CASES

	Private programmes			Programmes with government involvement	
Insurer	Green Delta Insurance Company	Sanasa General Insurance Company, Ltd. (SGIC)	Aseguradora Rural (AR) / MiCRO	Philippines Crop Insurance Corporation	APA Insurance / Kenya Agriculture Insurance Program
Country	Bangladesh	Sri Lanka	Guatemala	Philippines	Kenya
Year first offered climate risk insurance	2015	2010	2017	1981	2016
What's protected	Crop	Crop	Crop, business interruption	Crop	Crop
Risks covered	Excessive rainfall, cold spell, dry spell, temperature and/or humidity	Flood, drought, excess water, pest damage, plant disease, damage by wild animals, other natural perils such as storms, earthquakes, etc.	Excessive rainfall, severe drought, and/or earthquakes	Natural calamities, pests and diseases	Yield shortfall due to drought, excessive rainfall, flooding, uncontrollable pests and diseases, hailstorms, and wind
Type of coverage	Weather index	Indemnity	Weather / disaster index	Indemnity	Area yield index
Average premium rate (% of sum insured)	5.8%	7.05%	5% of the initial loan value	Rice: 10.90% Corn: 17.40%	4-20% Rates vary depending on the season, insured crops, number of counties, location (Unit Area of Insurance-UAI), and average production history for that UAI
Subsidy (as a % of premium)	0%	0%	0%	2 levels: Partial subsidy: 55% Full subsidy: 100%	Up to 50% allocated by government through State Department of Agriculture
Voluntary / mandatory	Voluntary	Mandatory	Voluntary	Mandatory for borrowing farmers Voluntary for self-financed farmers	Mandated by some aggregators Voluntary for the rest
Bundling	No	Bundled with loans	Bundled with loans	Small % bundled with loans	Bundled with inputs

Sustainability depends on balancing value for both clients and providers.

3. Programme Results

We looked at three key performance indicators to evaluate the results of the five programmes and the extent to which they are trending toward sustainability in terms of outreach (premium volumes and number of clients), client value (claims and incidence ratios) and profitability (combined ratios). We note that sustainability depends on balancing value for both clients and providers. Clients will not continue to buy (sustain) the product if they do not see value, and likewise insurers and distribution channels will not continue to offer the product if they do not receive net benefits in some form.

In this section, we look at these indicators with each of the programmes side by side, though we note that the programmes are not directly comparable. There are significant differences in types of products offered, programme objectives, level and specificity of data available, local market contexts, level of government involvement, maturity of the programme and more. Thus, we present the data together in order to provide examples of the various approaches companies have used and how they are faring, but we avoid making direct comparisons or conclusions regarding recommended or preferred approaches.

3.1. Outreach – Premium Volumes and number of Clients

PREMIUM VOLUMES

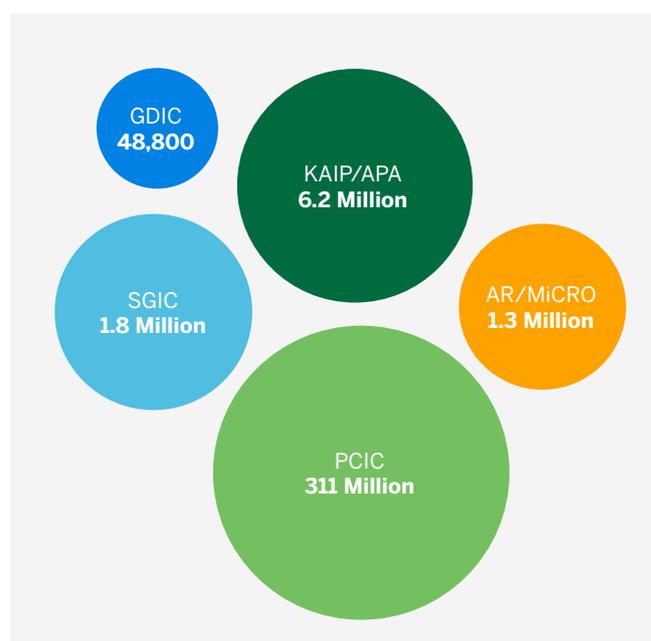
Gross written premiums, with the exception of PCIC, do not comprise significant volumes. Cumulative premiums in the 2016 to 2020 period ranged from less than USD 50,000 for GDIC to more than USD 310 million for PCIC (**Figure 3**). After reinsurance premiums are ceded (discussed in **Section 4.5**), these values are much lower. In the case of KAIP, with seven insurers in the consortium, the premium volume retained by a single insurer is a negligible proportion of its total business.

GDIC's premium volumes are extremely low, as their typical sums insured are low: the average premium paid per client in 2020 was less than USD 1, for an average sum insured of USD 13. This is due to GDIC's move towards partnering with more NGOs, many of which serve a significant portion of women clients with smaller plots of land farmed. In contrast, at approximately USD 50 per client, the average premium paid for AR/MiCRO's product is quite substantial for the low-income segment. However, this also translates into a meaningful coverage, with an average sum insured of more than USD 1,000 per client. Finding the right balance of meaningful coverage and affordability can feed into take-up rates, particularly for the voluntary programmes.

NUMBER OF CLIENTS

Scale is crucial to the sustainability of microinsurance schemes, given the relatively low average premiums. Each of the programmes in our study has reached a volume of at least 10,000 clients during at least one year, with the subsidized programmes reaching the most (more than 750,000 for KAIP/APA, and 1.6 million for the fully subsidized PCIC products), shown in **Figure 4**.⁶ The two programmes that offer the coverage on a voluntary basis (GDIC and AR/MiCRO) have insured the fewest clients over time, but they have both seen steady growth and increasing volumes for voluntary, unsubsidized programmes.

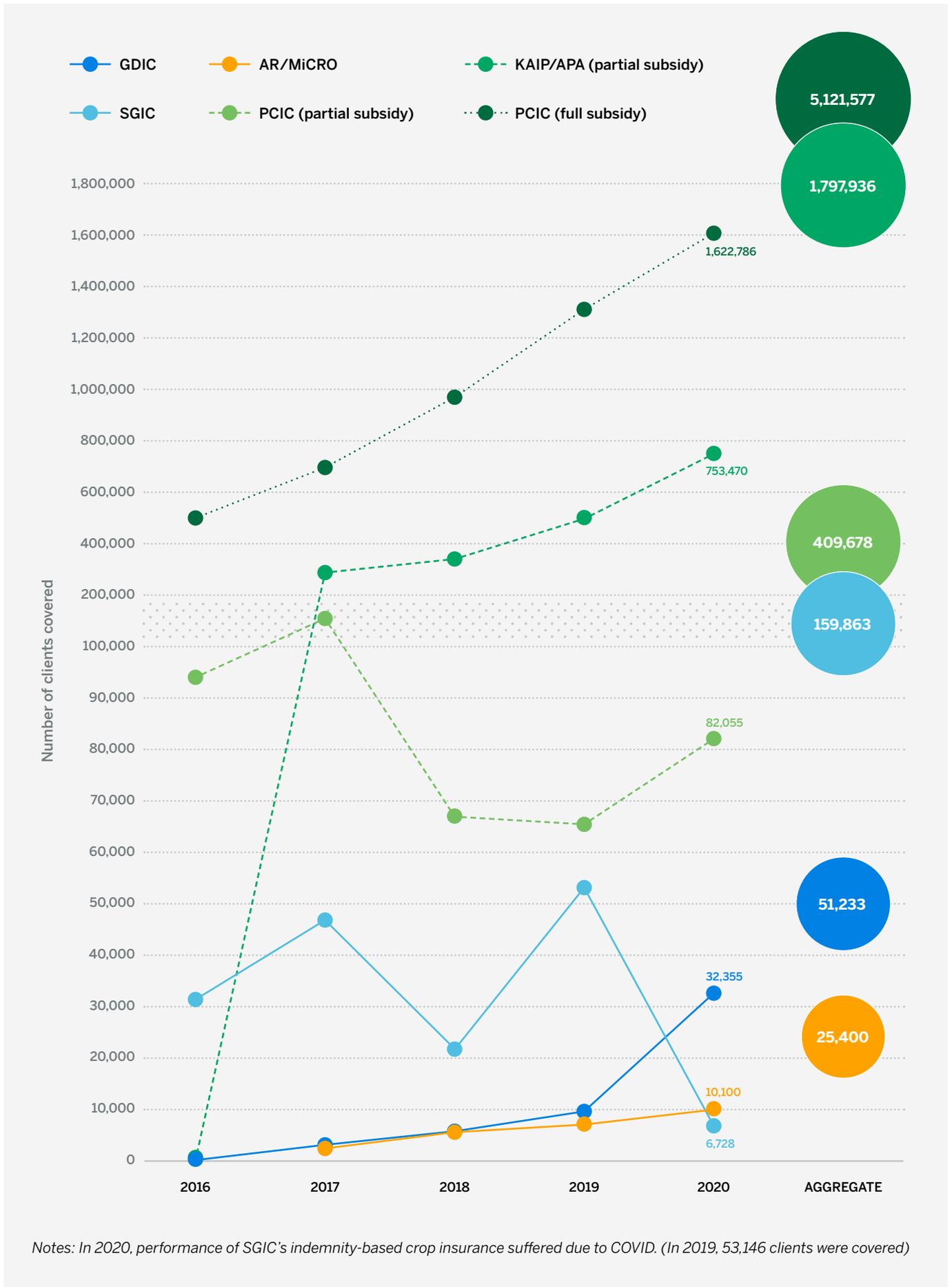
Figure 3: Cumulative Gross Written Premiums, 2016 - 2020



Each of the programmes, including those with voluntary sales, reached an annual volume of at least 10,000 clients, with subsidized programs reaching the most.

⁶ Note: In this Figure, we only look at PCIC's partial subsidy—clients who did have to pay some out of pocket premium.

Figure 4: Number of Clients by Program, 2016 - 2020

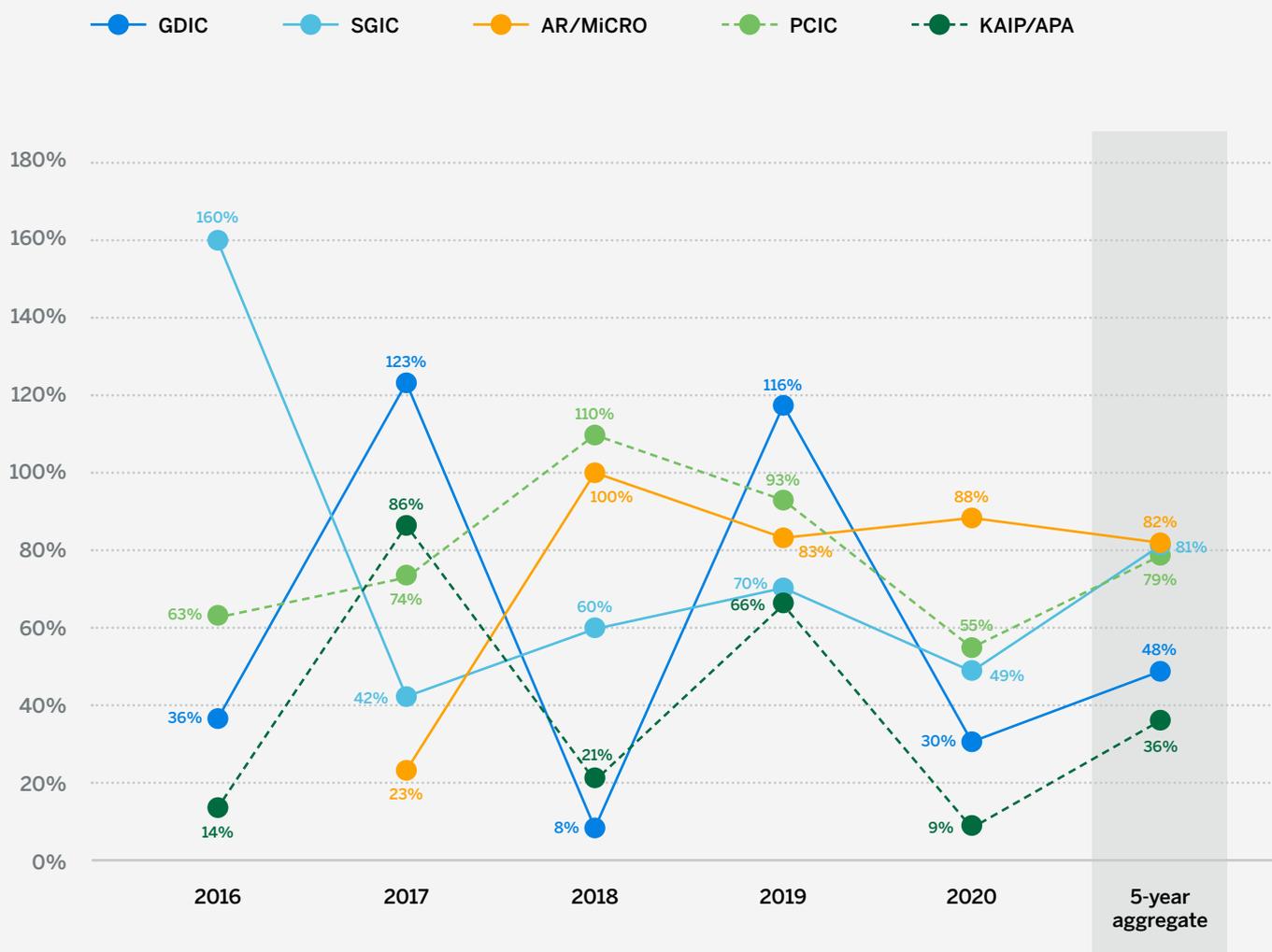


For the crop insurance programs, the number of clients covered in a given year represents a small fraction of the farmer base in each market: GDIC insured an estimated 0.2% of farmers in Bangladesh in 2020,⁷ SGIC reached an estimated 2.5% in 2019,⁸ and KAIP/APA reached about 20% in 2020.⁹ This leaves significant room for growth in the coming years. The GDIC team, for example, intends to grow business fivefold by 2025, while the KAIP consortium's growth plans aimed for 1 million farmers in 2021.

3.2. Client Value – Claims and Incidence Ratios

The intrinsic value of a crop insurance product lies in the extent, spread and efficiency of financial protection it offers to farmers from the pool created through collection of premiums. These elements of client value can be assessed through proxies of, for example, 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).¹⁰ **Figure 5** provides the claims ratios of the five programmes over the study period.

Figure 5: Claims Ratios by Program, 2016 - 2020



7 In 2019, it is estimated that there were 16.5 million farmer families in Bangladesh, according to the National Agricultural Census report (Retrieved from: <https://www.dhakatribune.com/bangladesh/agriculture/2019/10/27/agricultural-census-report-16-5-million-farmer-families-in-bangladesh>)

8 In 2018, it was estimated that there were 2.1 million persons employed in agriculture in Sri Lanka, according to Sri Lanka Labor Force Statistics Quarterly Bulletin, Q2 2020, op cit.

9 Kenya has an estimated 3.5 million small-scale crop farmers, according to the Kenya Agricultural Sector Transformation and Growth Strategy. Retrieved 22 September 2021 from <http://extwprlegs1.fao.org/docs/pdf/ken189053.pdf>

10 Arman Oza, op cit.

CLAIMS RATIOS

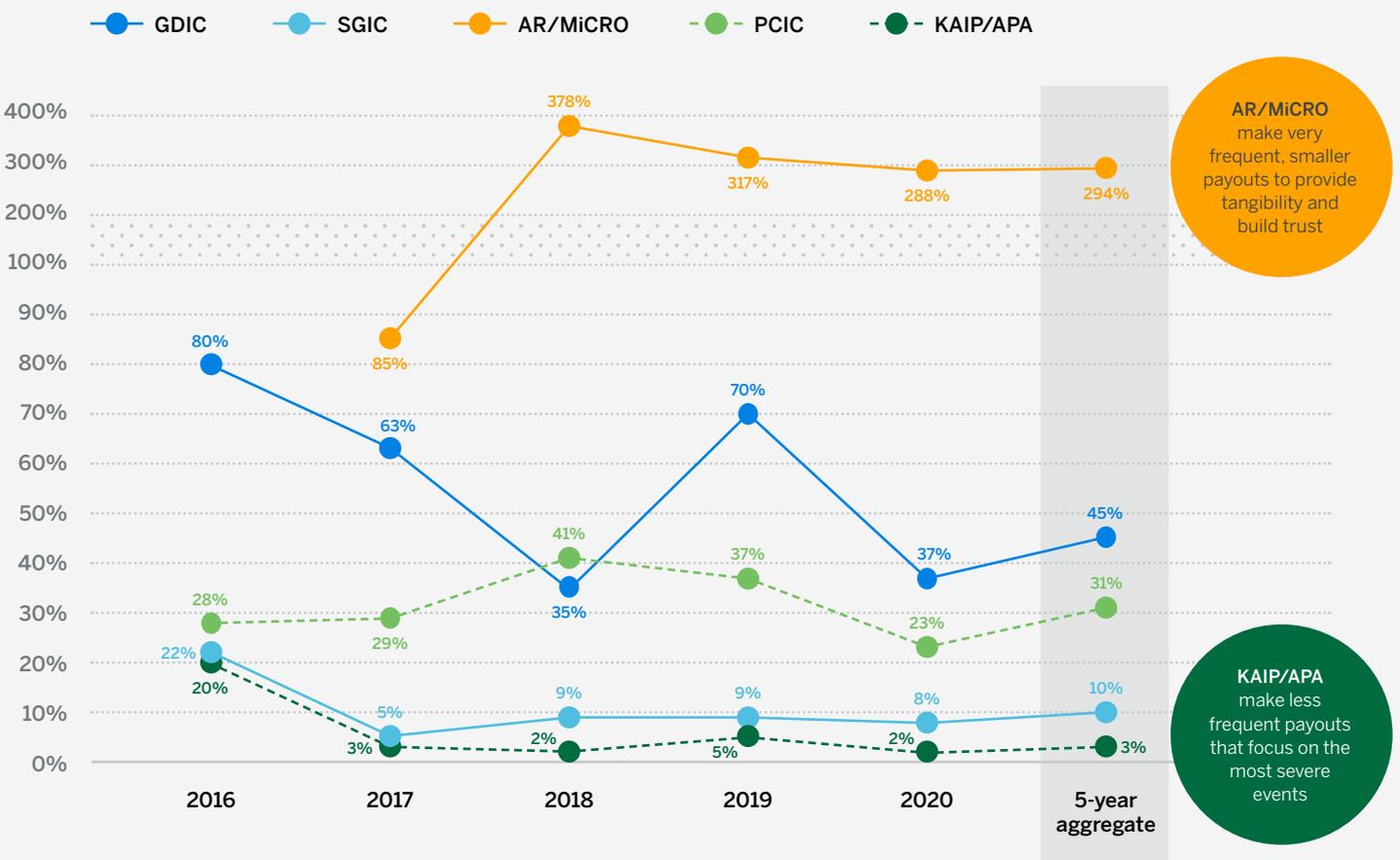
Given the nature of climate and catastrophic risks, high variance in claims ratios can be expected across years, in accordance with the weather. For most of the programs, we do observe this year-on-year fluctuation.¹¹ For example, in Bangladesh and Kenya, 2016, 2018 and 2020 were good years from a weather perspective, and we observe significantly lower claims ratios for GDIC and KAIP in those years.

What will be important for sustainability is how the aggregate claims ratio is managed over time. SGIC sources note that their target average claims ratio is around 60%, but due to climate change (droughts and floods being more unpredictable, etc.), it has been tough to keep it within that level year on year. Similarly, the AR/MiCRO programme targets an average claims ratio of between 50% and 70% in order to be sustainable. Looking at the five-year aggregate claims ratios, both programs are currently above their target, at 81% and 82% respectively, but are still well below 100%, leaving about 20% of premiums to cover costs. PCIC has a similar five-year aggregate claims ratio, while GDIC and KAIP/APA have significantly lower claims ratios, at 48% and 36%, respectively. Since the schemes (with exception of PCIC) have been in place for less than a decade, it is too early to make full conclusions on the sustainability of the pricing and claims experience. We also again note that sustainability depends on value for clients, and thus claims ratios also can't be consistently very low. KAIP has managed to continue scaling in recent years due to partnerships with government and strong aggregators, as well as the subsidy, but will clients find enough value in the KAIP product if the claims ratio stays at just 36% over time?

INCIDENCE RATES

The claims incidence rates show the proportion of insureds who received a payout in a given period. Higher incidence rates mean that more clients have experienced the benefits of insurance, and this can be used to provide tangibility and build trust. The claims incidence rates for the five programs, as shown in **Figure 6**, vary dramatically. AR/MiCRO's product paid an average of three claims per client per year, while KAIP/APA only paid claims to an average of 3% of clients per year. The implications of more frequent claim payouts are typically lower payout amounts, as well as higher administrative costs (to cover more frequent transactions). These are discussed later in this paper.

Figure 6: Claims Incidence Rates by Program, 2016 - 2020



¹¹ For SGIC, some of the variance is explained by the fact that in 2017 and 2018 some crops were excluded while the team was inspecting the reasons behind high claims ratios of 2016.

3.3. Profitability – Combined Ratio

The extent to which these programs can be sustained in the longer term requires that the insurer (and distribution channels) receive reasonable net benefits. As discussed in **Section 2.4**, most insurers expect to have indirect benefits that will eventually improve their bottom lines, such as improving their brand or reputation or building capacity. However, most of the insurers also expect at least modest direct financial returns (profit) in the medium to long term, and certainly they cannot sustain significant financial losses. To assess whether the studied programs are trending toward profitability, we looked at the estimated combined ratios: claims ratios plus expense ratios (total estimated costs of the scheme as a portion of premiums). Combined ratios of less than 100% indicate that the scheme is likely profitable; that is, claims and expenses (outflows) are less than premiums (inflows).

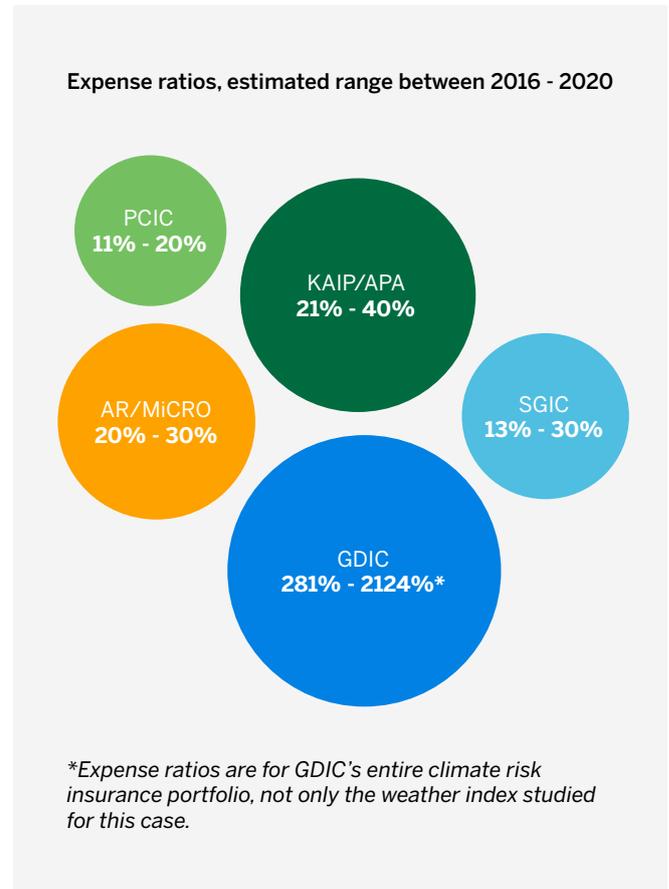
EXPENSE RATIOS

Each of the programs provided an estimated range of expense ratios for the five-year period of study, which ranged between 11% and 40% of premiums (see **Figure 7**). The study could not confirm the extent to which these ratios are an accurate representation of the actual costs of operating the specific program. The outlier is GDIC, which reported significantly higher expense ratios. This is due to its comparatively lower premium volumes, as shown in **Section 3.1**. GDIC also noted that many costs incurred in the initial years are start-up costs, such as office setup and equipment for employees, which should be treated as investments and depreciated over time rather than treating them expenses in the year purchased. GDIC expects its high fixed costs per policy to reduce with time as scale continues to grow.

COMBINED RATIOS

When we combine the expense ratios with the claims ratios, we see a mix of results both above and below the 100% threshold. GDIC's combined ratios are entirely driven by its expenses. With the exception of 2016, SGIC has likely kept its combined ratio below 100%, which is positive for financial sustainability. The combined ratio for the AR/MiCRO scheme has hovered over 100%, but as AR cedes 100% of the risk to a reinsurer (see **Section 4.5**), this is not necessarily a reflection of its own profitability. Rather, it has to be able to distribute and manage the programme within the 20% to 30% of premiums that it retains to cover the expenses. Looking at the estimated combined ratios in **Figure 8**, KAIP seems to be more profitable than PCIC. After accounting for expense ratios (11% to 20% for PCIC and 22% to 40% for KAIP), it would seem that KAIP is the more surplus generating of the government programmes, even given that it seems more expensive to deliver while paying fewer claims. With combined ratios between 83% and 130%, PCIC seems to be operating at a just-sustainable basis while passing on good value to customers.

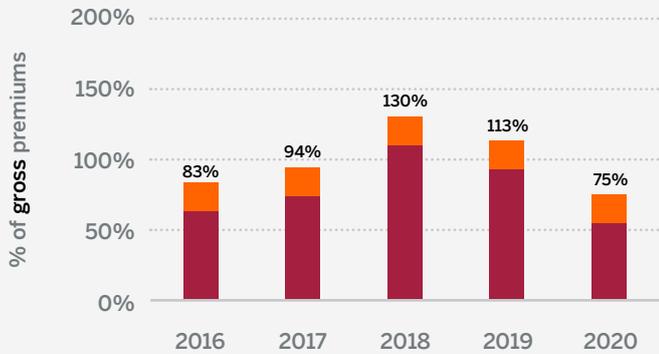
Figure 7: Estimates Expense Ratios



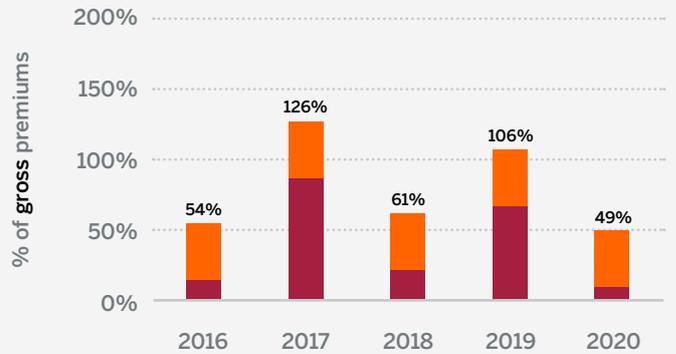
Most of the insurers expect at least modest direct financial returns in the medium to long term.

Figure 8: Combined Ratios by Program, 2016 – 2020

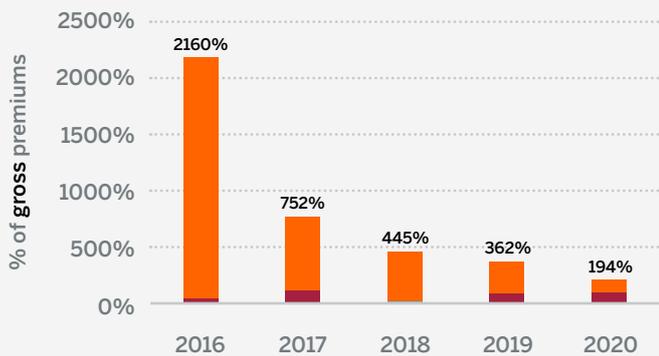
PCIC (partial and full subsidy)



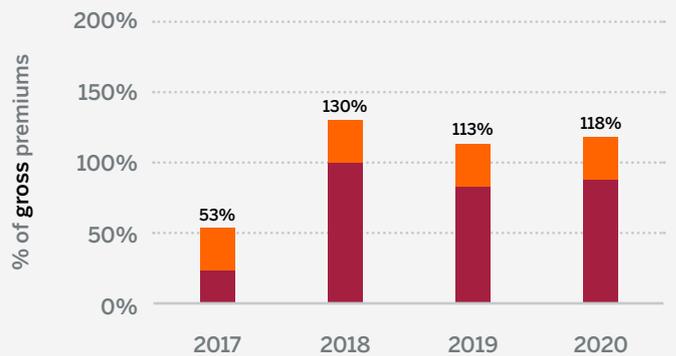
KAIP/APA



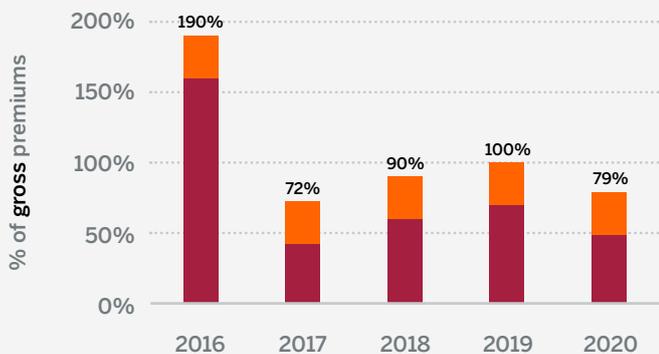
GDIC (full climate portfolio)



AR/MiCRO



SGIC



■ Claims ■ Expenses

Figures use the maximum estimated expense ratio in each year.

4. Insights and trends from the case studies

4.1. Strategic Approach

Each institution took a unique approach to fit climate risk insurance within their own context and organisational strategy, but common themes emerged.

The five programs generally had strong support from the senior management and Board, a focus on client-centricity, and a mid- to long-term approach to returns, with a focus on experimentation and learning.

VISIBLE SUPPORT AT THE TOP

SGIC's Board mandated climate risk insurance to be 10% of its portfolio, cementing the importance throughout the organisation. The programme at AR was aligned with overall mission and strategy; they pitched it to Banrural's board and used top-down approach to make insurance one of the core products.

CLIENT-CENTRICITY

Scheme design took a client-centric approach, not just for social reasons, but also from the business case perspective: better products for clients leads to higher take-up. GDIC conducted in-depth research (focus group discussions, FGDs) and ability-to-pay exercises with each partner, in order to customize products and services, and then ensuring customers receive regular information on the product. AR and MiCRO conducted in depth client research and needs assessments prior to launch, and customized the product based on specific locations and target markets. SGIC focused on providing client value in the absence of subsidy (ensuring that policyholders get their money's worth, knowing that it is expensive).

4.2. Payout Structure

Voluntary programs used a payout strategy of small but frequent payouts to build trust early on, but most insurers are opting for a more typical and sustainable low frequency, high value payout structure.

While insurance is typically intended to focus on covering the costs associated with low frequency but high impact shocks, some insurers initially offer products with the opposite structure: making more frequent smaller payouts for less severe events. This strategy has been deployed by index programmes to make the insurance product tangible and to build trust in the market that insurers will pay claims. It is believed to help build a voluntary market faster, and indeed we see both of the voluntary programs in the study employ this approach. Both GDIC and AR/MiCRO pay claims with comparatively high frequency, but with much lower payout values than the other programmes (*Figure 9*).

EXPERIMENTATION AND LEARNING

GDIC has entered the climate risk insurance space with an experimentation mindset and introduced a variety of programmes including yield index, livestock insurance and flood index, in addition to the weather index that we studied. Similarly, APA believes that learnings from its participation in KAIP can be beneficial to its other initiatives.

INTEGRATION

None of the companies expect climate risk microinsurance to be a profit driver and generate major returns on its own. GDIC tracks its expenses and manages them across the portfolio. AR leverages the wider corporate group structure—with which they have a shared 'mística,' or vision. By leveraging their parent bank as a distribution channel, they avoided significant distribution fees or commission costs. Similarly, PCIC has diversified into other higher-value product lines that are more profitable, in effect self-subsidizing.

MID- TO LONGER-TERM TIME HORIZONS

While GDIC management is clear about building a sustainable climate programme, it has not put immediate pressure on profitability and has given the team a 10-year runway to achieve breakeven by 2025. MiCRO's time horizon when it began in 2016 targeted breakeven around 2023.

Because Esfuerzo Seguro was the first index-based insurance product in Central America, **AR and MiCRO** felt that one way to increase customer awareness and show the value of the product was to make small payouts for less severe incidents. Although the product was designed to protect clients against severe natural hazards, it also makes rather small payouts for moderate events. Each claim payout was a touchpoint to educate Esfuerzo Seguro customers and a way for them to experience the benefits of insurance. Based on their experience, MiCRO has found that improving awareness about the product and allowing customers to experience insurance in the form of claims helps mitigate concerns

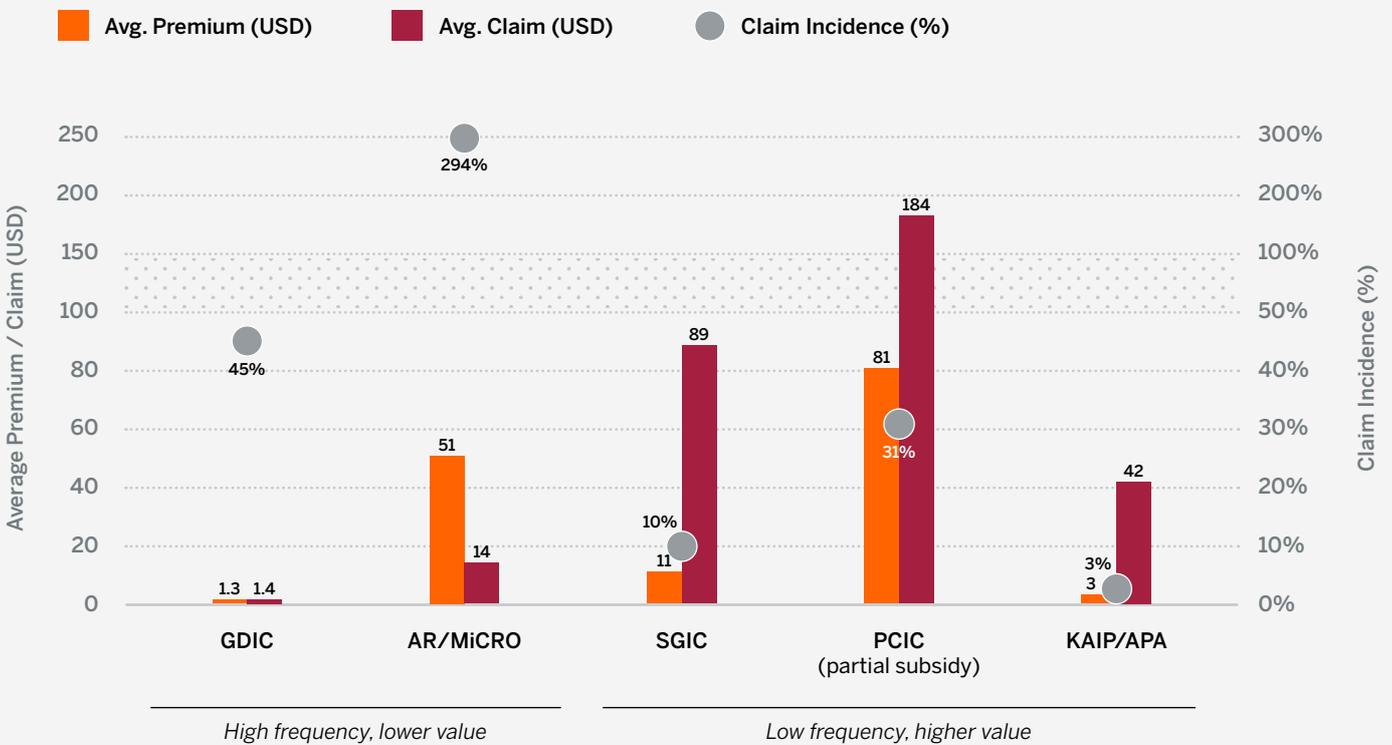
around affordability (customers will buy a product they find useful and valuable). Indeed, the renewal rate is estimated at between 70% and 80%, indicating that clients are experiencing value with the coverage.

Similarly, **GDIC** focused on affordability and providing Bangladeshi farmers the experience of insurance with very small ticket sizes. 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. Thus, they have opted for a higher claims incidence rate to ensure that as many people saw tangible

value from the product as possible, even though that meant smaller individual payout values.

While these strategies may build scale of voluntary programs, a key drawback is the added expenses of making many small payouts. In the case of AR and MiCRO, with customers having experienced multiple payouts and reputation established, in September 2020 they adjusted the product parameters to reduce the frequency of payouts and make them more meaningful in amount. This was needed to improve the sustainability of the product. The impact to the business of moving from a high frequency of low-value claims payments to lower frequency higher-value payments is not clear from the data available.

Figure 9: Payout Structures Used



4.3. Managing claims

Providers used **product design modifications** and promoted **holistic risk management solutions** in order to manage claims in the short and long term.

One of the greatest hesitations in offering climate risk microinsurance products is the limited understanding of the future impact of climate change and its systemic threat. A greater number of catastrophic events and their increasing impacts on local communities pose true risks to insurers offering climate insurance. To respond to these threats, insurers reprice, re-arrange and potentially exit portfolios to avoid long-term exposure to such climate risks. These concerns were also observed across the case studies, with insurers employing various strategies to adapt.

PRODUCT DESIGN CHANGES

At least two of the programs made adjustments to product design early on in the programme in order to manage claims:

After two seasons and an 86% claims ratio in 2017, **KAIP** made pricing and product design adjustments to decrease claims.

In 2018, **SGIC's** management reduced enrolment in crop insurance, prompted by a high claims ratio in 2016 which they deemed an issue with inadequate pricing for maize and some other specific crops. This was rectified by excluding coverage for some crops until better data could be obtained on those crops and, eventually, increasing the premium rates for maize in 2020.

With these pricing adjustments, insurers face a delicate balancing act between over-compensating for a single 'bad weather' year and predicting long-term climate-induced trends.

PROVIDING HOLISTIC RISK MANAGEMENT SOLUTIONS

Insurers can also play a role in providing support to customers to mitigate climate change risk through adaptation. Through building

greater resilience for customers in protecting their crops and well-being, insurers can better manage climate change risks. Taking a broader approach to risk management beyond simply insurance is one way insurers are doing this.

The iFarm app used by **SGIC** provides free value-added services to the farmers, including some that can help farmers manage their own risks, such as predictive weather reports and a news portal with information on best practices. With better practices and decision making, farmers can actually reduce their overall risk (e.g., by planting more drought or flood resistant varieties, etc.), and ultimately this can result in fewer insurance claims (expected losses), while increasing tangibility of the insurance.

AR and MiCRO's programme partnered with the National Coordinator for Disaster Reduction to provide customers with tools to raise awareness about disaster risk preparedness, including a financial education programme to empower consumers and complimentary giveaways such as a 72-hour emergency backpack for use after a disaster.

4.4. Use of donor support

Private programs kept expense ratios low by utilizing donor funding as an indirect subsidy to support up-front costs.

All three private programs used donor funding as an indirect subsidy to fund key investments both early on and throughout the program, and not have to load the premiums to cover those expenses. Donor funding received was not provided in a form of direct premium subsidies, but in a more sustainable form of technical assistance, infrastructure setup, capacity building, etc. It seems that in the absence of government support, donor funds were able to cover the high start-up costs of the climate programmes (set-up, capacity building, product design, technology, etc.) and keep expenses manageable for the insurers.

GDIC received support from three donors over their first five years of operation. The donors and GDIC have ensured that funding is not 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. Rather, they covered some of the up-front investments necessary to build a sustainable climate insurance programme. Early funding provided index product design and actuarial support, while building internal capacity to continue. Other funding was used to build infrastructure (weather data grid) and access to markets, thereby creating a sustainable environment for delivery of climate risk products. As of 2020, the programme was running without donor support.

SGIC received donor support for a specific initiative to bring down costs. They believe that they can bring down premium rates by reducing their distribution expenses. To achieve this, they launched an app called 'iFarm' in 2020 with donor support. iFarm is expected to help reduce expenses through digital modes of delivery and claims payment while offering value added services to farmers.

Figure 10: Uses of donor funding



The development of **AR and MiCRO's** Esfuerzo Seguro programme was supported by two donors and the reinsurer Swiss Re, in the context of the Central American Disaster Microinsurance Expansion program. Funding covered the market entry costs, which include viability analysis, product design and operational setup, as well as client education materials and technical assistance on the negotiations with the regulator.

None of the programs intend to rely on donor funding in perpetuity. GDIC has stopped relying on donor funding after five years, and SGIC has received donor funding only to build a technology platform that is more of a risk reduction tool but otherwise is entirely self-funded.

4.5 Reinsurance

Reinsurers are the backbone of climate risk microinsurance.

Re-insurers are the backbone of climate risk microinsurance. Currently we see reinsurers bearing most, and in some cases all, of the risk, especially in climate programmes run by private insurers. On the other hand, we also see some government run programmes being self-insured (**Figure 10**).

By nature, re-insurers have greater capacity to take on catastrophic risks with large exposure. In our case studies, re-insurers have also played an important role in understanding the risks associated with climate change and building the market for climate risk products by supporting local insurers, who are looking to gain experience.

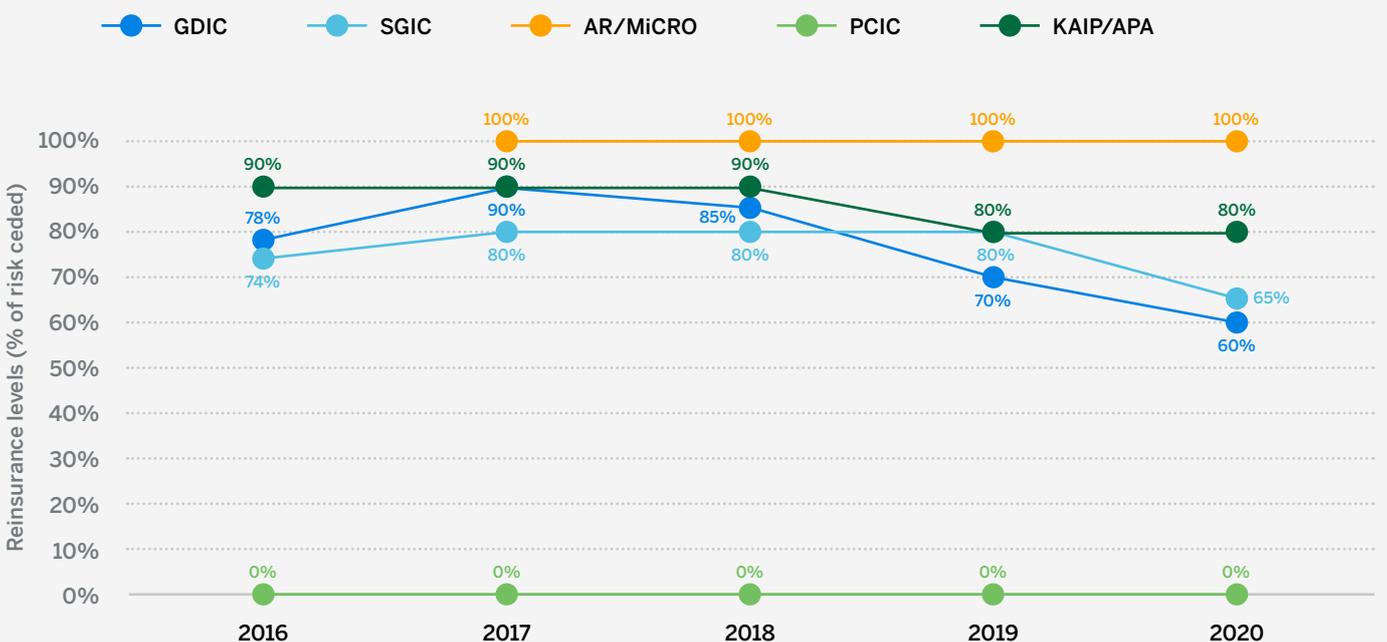
GDIC noted that during the initial pilot period of three years, the company retained only a small portion of the sum insured to reduce shocks of large losses. Over time, it is increasing its retention, as can be seen in the table in **Figure 10**. Going ahead, it plans to retain 20% to 40% of the sum insured to be able to gain experience, without taking too much risk onto its books.

SGIC has ceded a varying proportion of premiums over time based on the reinsurers' comfort and SGIC's need, ranging from 65% to 80% premiums ceded.

AR does not retain any risk on its books. This is because local insurers and reinsurers in Guatemala do not yet have appetite to retain catastrophe risk. Also, since these products are new to the region, regulators have yet to come up with regulations for index insurance products, such as around capital requirements. **MiCRO** and Swiss Re expect that small amounts of risk will be retained locally over time. By distributing the products to its customers, AR gets the experience of delivering climate risk products and building up a customer base who is familiar with these products.

According to **PCIC**, it has not availed of any reinsurance coverage for crops and livestock since 2010, because based on its actuarial studies, it is thought to be less costly, and within risk tolerances, for

Figure 11: Reinsurance levels (% of risk ceded)



PCIC to self-reinsure. Due to their longer history and having built up significant reserves, if the payouts exceed the monies collected, they dip onto their reserves or past earnings.

KAIP's insurer consortium's only retained 10% of the risk at inception. With limited microinsurance expertise when the scheme began, the seven insurance companies all contributed experts to a technical committee, which jointly provided analysis on various aspects of the scheme. As a result, all the companies involved have been able to benefit from their joint expertise and gradually build their capacity. At the same time, the consortium has been able

to gradually retain more of the risk, doubling to 20% in 2019, and aiming to eventually retain up to 30%.

As the frequency and magnitude of climate risk events increase and as private players get more experience, we expect to see more balanced risk sharing between private players, reinsurers and governments. Arguably, as insurers move from their start-up phase to a more stable mid-sales phase, there should be a thoughtful but deliberate move to increase their retention. One possible scenario could be private players and reinsurers sharing the risk to an extent, with governments covering the excess.

4.6 Government subsidies

Premium subsidies by government are clearly linked to higher scale but are subject to constraints.

THE MAJORITY OF THE DISASTER INSURANCE SCHEMES OBSERVED IN LOW- AND MIDDLE-INCOME COUNTRIES INVOLVE THE USE OF PREMIUM SUBSIDY.

In many instances, premium subsidies are directly made in full or part. World Bank research in 2010 on agricultural insurance across the low and middle-income found that public subsidies represented 50% to 150% of the premium paid by farmers, and 63% of all countries surveyed provided premium subsidies.¹² A 2020 study by GIZ found that 80% of agriculture insurance programs are subsidized.¹³

SUBSIDY IS CLEARLY LINKED WITH SIGNIFICANTLY HIGHER SCALE.

In both the case of PCIC and KAIP, government subsidies are provided directly on a continuous basis. The subsidies cover 55% to 100% of premiums in the case of PCIC, and up to 50% in the case of KAIP. The two programmes appear to have achieved scale largely thanks to the subsidy allocations, reaching significantly higher client volumes than the private sector programs (**Figure 11**). Since inception of the rice insurance programme in 1981 and corn insurance programme in 1982, PCIC has insured over 4.7 million farmers under a partial subsidy scheme, and almost 6.3 million farmers under a full subsidy scheme since its introduction in 2013. PCIC's dramatic increase in outreach is driven by the introduction of the full subsidy.

SUBSIDY IS SUBJECT TO GOVERNMENT BUDGETARY CONSTRAINTS.

However, though subsidy can help in achieving scale, it can also be a limiting factor unless a government allocates enough budget year on year to cover their smallholder/vulnerable farmer base. Lack of a sufficient subsidy budget seems to be holding up PCIC from covering more farmers. Of the 10.9 million farmers and fisherfolk

in the Philippines, PCIC was able to insure around 2.6 million in 2020, across all product lines and subsidy programmes. That is a coverage of almost 24% of the target population, only slightly more than KAIP's 20% outreach, which seems low given that this is the only crop insurance available to Filipino farmers, it is free to many of them, and has been in existence for 40 years. PCIC sources noted that the premium subsidy budget is expected to increase by 1 billion pesos (about USD 21 million) per annum starting in 2022. These annual increments are expected to help increase outreach.

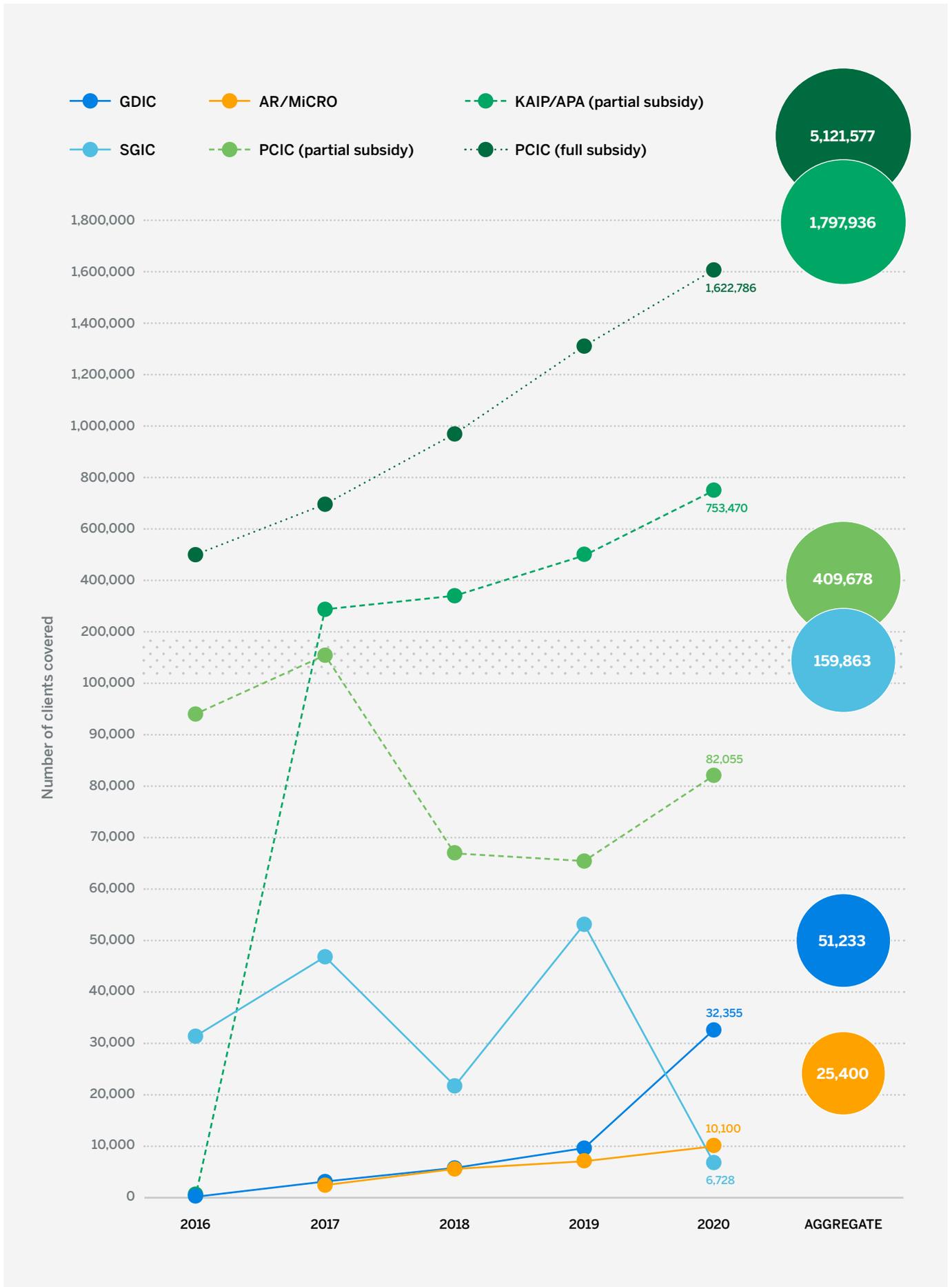
In Kenya, the government's subsidy budget has fallen short of being able to cover all enrolled farmers. Furthermore, the subsidy budget per season is not known upfront from an operational budgeting perspective. The government typically allocates an amount retrospectively once farmers have been enrolled for a season; this creates operational issues for KAIP, since they only collect 50% of the premiums from farmers at enrolment. To deal with this uncertainty the insurers must either begin collecting 100% of the premium upfront and then reimburse farmers when the subsidy is allocated or collects 50% of premium but include a clause that coverage will be reduced if the government does not provide the subsidy.

Though subsidy can help in achieving scale, it can also be a limiting factor unless a government allocates enough annual budget to cover the target farmer base.

12 Mahul, O., & Stutley, C. (2010). Government Support to Agricultural Insurance, Challenges and options for developing countries. World Bank

13 Hazell, P., Jaeger, A., & Hausberger, R. (2021). Innovations and emerging trends in agricultural insurance for smallholder farmers— an update. GIZ

Figure 12: scale of Subsidized Programs, Number of Insureds



4.7 Role of government

Key roles include encouraging the private sector to address market gaps in serving low-income populations, allocating funding, and working in partnership with private sector to deliver services.

GOVERNMENTS ARE FUNDAMENTAL TO ADDRESSING THE CONSEQUENCE OF NATURAL DISASTERS, PARTICULARLY IN PROTECTING THE MOST VULNERABLE IN THE SOCIETY.

To combat climate change and its impacts, the United Nations urges governments to confront climate risks with emergency recovery plans to ensure rapid resilience.¹⁴ Public-private partnerships (PPPs) between the insurance sector and the government are often established to address market gaps within the management of climate risks. Such interventions within the insurance industry have proven effective, particularly in the lowest-income countries.¹⁵ Government-led crop insurance schemes seem to be aimed at making the government's post-disaster response fairer and more efficient. Instead of providing post-disaster cash support to affected areas without evaluating the actual damages, an indemnity-based crop insurance scheme led by private sector insurers and adjusters allows the government to provide relief to farmers based on damages incurred.

VALUABLE PUBLIC-PRIVATE PARTNERSHIP

There is a role for governments to play in climate risk microinsurance, given the scale required to be reached and absence of infrastructure and capacity within many countries. At the same time, there seems to be a scope for private sector participation, with our data suggesting marginal early profits for private players, apart from other motivations such as capacity building that could be useful going forward.

To the maximum extent possible, PPPs should not stifle external competition, crowding new private competitors out of the market. Instead, they should be designed in a way that boosts and encourages the private insurance sector's gradual and further engagement in agriculture, 'paving the way' through public example.¹⁶

4.8. Use of technology

Insurers use a variety of front- and back-end technology to reduce costs.

As with many agriculture and climate risk insurance programs globally, the programmes in our study applied technological innovations in a variety of ways to reduce expenses. These impact both internal and client-facing processes.

The PPP between government and private sector in the case of **KAIP** seems to be a good example of this. Within five years since inception, KAIP is reaching around 20% of Kenya's smallholder farmer base (similar to what PCIC has reached after 40 years), with private distribution channels accounting for 90% of premium collection and with private insurers and reinsurers underwriting the risks. On an average, the combined ratios are in a comfortable range (61% to 79%) for the insurers and reinsurers to consider it profitable, though the product seems to offer lesser value to customers (five-year claims ratio of 36%). It is too early to say if private participation is driving down the value offered to customers at the cost of making profits for insurers. Another plus point of a PPP model is that because of private participation, Kenya is helping private insurers within the country build capacity to take on climate risks, which will be crucial over time.

The scheme's sustainability depends highly on government budgetary considerations rather than 'operational profits.' While this self-reliance has given **PCIC** complete control over the programme, it has also been a limiting factor. PCIC sources say that they believe PPPs would help improve outreach of crop insurance if private sector partners cover the higher-end commercial farmers at market rates but with PCIC's support for distribution, while PCIC focuses its efforts and subsidy funding on subsistence farmers. As per PCIC sources, over the years, the PCIC has been encouraging the private sector to participate in the crop insurance programme. In the past, the private sector was providing livestock insurance, and a pool of private insurers joined the crop insurance programme briefly. While there is an ongoing public-private partnership between PCIC and Pioneer (a private insurance company) for high-value commercial crop insurance facilitated by the Asian Development Bank (ADB), the private sector has not sustained its interest in participating in rice and corn insurance.

KAIP employs a 'state-of-the-art method of collecting crop yield data, using statistical sampling methods, GPS-tracking devices, and mobile phones.' APA reports that this technology has reduced costs through efficiency gains and has also improved the quality of data collected. On the front end, the consortium is also exploring

14 United Nations. Sustainable Development Goals. Retrieved 22 November 2022 from: <https://www.un.org/sustainabledevelopment/climate-change/>

15 Perazzini, S. (June 2020). Public-Private Partnership in the Management of Natural Disasters: A Review. IMT School for Advanced Studies Lucca. Retrieved 22 November 2022 from: <https://arxiv.org/pdf/2006.05845.pdf>

16 FAO (2021). Protecting livelihoods – Linking agricultural insurance and social protection. Rome. Retrieved 30 November 2022 from: <https://doi.org/10.4060/cb2690en>

use of digital tech to facilitate marketing and enrolment and reduce transaction costs.

SGIC's iFarm app is 'a simple and secure online insurance platform to support the local farming community.'¹⁷ The platform provides local farmers access to the weather index and indemnity-based

crop insurance products offered by SGIC. By facilitating a simple method for enrolling in insurance and making claims, SGIC estimates a 5% to 15% reduction in expenses. The web- and mobile-based platform will also provide free value-added services to farmers, including tools and advice that can help farmers reduce their risks, such as weather alerts, best practice information, and more. This could eventually translate to reduce claims costs.

4.9. Distribution

Insurers seek strategic alignment with distribution partners, with a focus on financial institutions

A BUSINESS-TO-BUSINESS-TO-CONSUMER (B2B2C) DISTRIBUTION MODEL IS USED BY ALL PROGRAMMES IN THE STUDY.

The insurers partnered with a variety of organisations (**Table 4**) including with financial institutions such as banks and MFIs. The other key type of delivery channels are organisations that support farmers at various stages, such as input suppliers, NGOs, contract farming companies and farming hubs. Government channels were used by the two PPP programmes.

THE COMMON THREAD ACROSS PARTNERSHIPS WAS FOR THE INSURER TO ENSURE THAT THE DELIVERY CHANNEL ALSO SAW STRATEGIC VALUE IN THE INSURANCE.

For example, GDIC conducts thorough due diligence with each partner to ensure there is a strategic alignment and to better understand the partner's farmer base. It then conducts a needs

assessment and ability-to-pay exercise with the client base of smallholder farmers to allow them to customize the product for that partner. While AR's key partner, the bank Banrural, shared financial inclusion objectives with AR, it also believed that strengthened resilience of its customer base would in turn strengthen its own portfolio. Similarly, SGIC partners with financial institutions and bundles the insurance with loans, which helps the banks better manage the risks in their portfolio. The product was designed to meet the needs of both the bank and the clients, and thus provides more comprehensive coverage (and has relatively higher premiums as a trade-off). For KAIP, the strategic benefit to the aggregators with which they partner—because they are heavily involved with local farming communities and provide inputs of various kinds (often on credit)—bundling insurance with their inputs has helped the aggregators as well as their farmer clients manage their risks.

TABLE 4: DISTRIBUTION CHANNELS USED BY PROGRAMME

Channel	GDIC	SGIC	AR/MICRO	PCIC	KAIP/APA
MFIs	●	●		●	
Banks and other financial institutions		●	●	●	
Input suppliers	●				●
NGOs	●		●		
In-house staff		●		●	
Government				●	●
Contract farming companies	●				
Farmer hubs	●				

¹⁷ Ceylon Business Reporter (26 January 2020). iFarm Platform Offers Value-Added Services to Empower Local Farmers. Retrieved 8 October 2021 from <https://cbr.lk/markets-and-financial/ifarm-platform-offers-value-added-services-empower-local-farmers/>

5. Concluding remarks

The climate risk insurance programs that were examined for this research, as well as others, have shown themselves to be innovative, patient, flexible and optimistic that they will reach a level of medium- to long-term sustainability. They have a range of different approaches—CSR or profitability-driven, government-supported or fully-commercial, index- or indemnity-based, mandatory or voluntary. None of the programs has found a clear formula for success, but each is actively learning and adjusting on its journey to sustainability.

Undoubtedly, the path to sustainability requires a long-term investment and commitment from the insurer. Partnerships are a common thread across all programs; whether with donors, reinsurers, technical assistance providers or governments, insurers need strong partnerships to deliver on climate risk microinsurance. Premium subsidies can help scale and make products affordable, but they need to have a smart design and exit strategy. Product designers are trying innovative and different ways to balance coverage and cost for clients, while working with the uncertainty of how climate change will impact claims experience.

The disproportionate impacts of climate change on vulnerable populations cannot be ignored, and insurance has an important role to play. More research is needed, but we hope the cases presented here will contribute to and spark the efforts of insurers, reinsurers, donors, governments and others in developing valuable and sustainable climate risk insurance solutions for vulnerable populations.

Appendix 1: Glossary

MICROINSURANCE

Insurance designed specifically for the low-income market. Microinsurance products are based on insurance principles implemented by regulated insurers and/or governments with a goal of profitability or sustainability.

INDEMNITY-BASED INSURANCE

Insurance that compensates an insured farmer based on the assessed loss or damage sustained. This type of insurance requires individual loss assessments and, in many cases, some monitoring to avoid moral hazard problems. The most common forms are multiple peril crop insurance (MPCI) and specific or named peril insurance.¹⁸

INDEX-BASED (PARAMETRIC) INSURANCE

Insurance that pays out after an index has been triggered by exceeding a predefined threshold (e.g., a certain air temperature over a period of time or a certain wind speed). Not requiring a claims assessment process, this product allows for a quicker claims settlement. Index insurance can be designed as a weather-station-based, satellite-based or yield-based product, referring to the kind of trigger used to determine the insurance payout.¹⁹

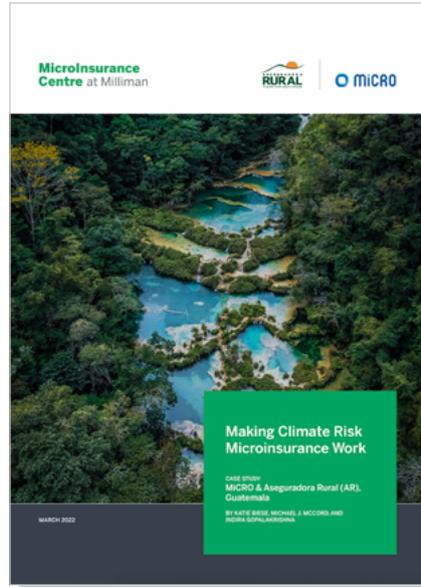
¹⁸ GIZ Innovations and emerging trends in agricultural insurance for smallholder farmers – an update

¹⁹ Munich Climate Insurance Initiative, [‘Making Climate Risk Insurance Work for the Most Vulnerable, Seven Guiding Principles’](#)

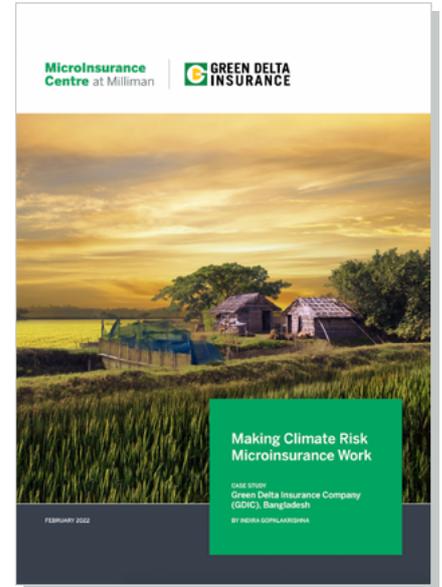
Appendix 2: Links to individual case studies



Kenya Agriculture Insurance Program (KAIP), with APA, Kenya



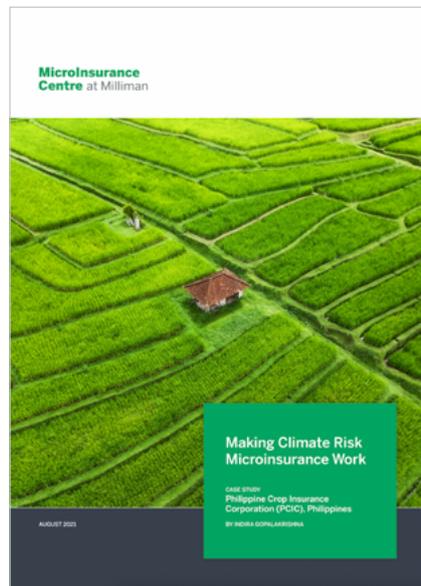
MiCRO & Aseguradora Rural, Guatemala (also available in Spanish)



Green Delta Insurance Company (GDIC), Bangladesh



Sanasa General Insurance Corporation (SGIC), Sri Lanka



Philippines Crop Insurance Corporation (PCIC), Philippines

Appendix 3: List of analysed insurance schemes²⁰

The following is a list of initially considered insurance schemes. These were reduced to five based on several factors which include: access to five years of data, program management willingness to participate, meeting minimum policy volume thresholds, a balance of programme types and others.

Scheme	Level/ Beneficiary	Country/ Region	Type of Insurance	Perils
Index-Based Livestock Insurance Project (IBLIP)	Micro/farmers	Mongolia	Index-based livestock	Severe winter
Agricultural insurance programs of Philippine Crop Insurance Corporation (PCIC)	Micro/farmers	Philippines	Indemnity-based crop	Natural calamities
National Agricultural Insurance Scheme of Agricultural and Agrarian Insurance Board (AAIB)	Micro/farmers	Sri Lanka	Index-based crop	Drought
Parametric weather insurance programme by SOMPO	Micro/farmers	Thailand	Index-based crop	Drought
Several schemes	Micro/farmers	Indonesia	Index-based	Cyclone, drought, flood
Pradhan Mantri Fasal Bima Yojana (PMFBY) of the Ministry of Agriculture and Farmers Welfare	Micro/farmers	India	Indemnity-based crop	Multiple, including drought, flood, pests/diseases, storm
Agricultural insurance programs by Sanasa General Insurance Company (SGIC)	Micro/farmers	Sri Lanka	Indemnity-based crop	Multiple, including drought, excess rain, flood, storms, disease etc
Agricultural insurance programs by Green Delta Insurance Company (GDIC)	Micro/farmers	Bangladesh	Index-based crop	Cold spell, dry spell, excess rainfall, temperature and/or humidity
Kenya Agriculture Insurance Program (KAIP)	Micro/farmers	Kenya	Area-yield index (crop)	Drought, excess rainfall, flood, hail, uncontrollable pests and diseases, wind
Esfuerzo Seguro programme of Aseguradora Rural and MiCRO	Micro/farmers and microbusiness owners	Guatemala	Index-based crop and business interruption	Drought, earthquake, excess rainfall
Caribbean Catastrophe Risk Insurance Facility (CCRIF)	Macro/government	Caribbean	Index-based catastrophe	Earthquake, excess rainfall, hurricane
Pacific Catastrophe Risk Insurance Company (PCRIC)	Macro/government	Pacific	Index-based catastrophe	Earthquake, cyclone
Southeast Asia Disaster Risk Insurance Facility (SEADRIF)	Macro/government	Philippines	Index-based catastrophe	Flood

²⁰To the best of our knowledge, the information contained herein is accurate and reliable as of April 2022

Appendix 4: Insurer questionnaire data

The following are a list of topics that were discussed with participating insurers. Insurers populated the request for data according to each climate risk microinsurance product they offer as of 31 December 2020, and for the years 2016 through 2020. All data was voluntarily submitted, and insurers had the option to choose to provide only the data they felt comfortable providing.

PRODUCT

- Name
- Policy type
- Beneficiaries

PARTIES INVOLVED

- Insurer
- Reinsurer
- Distribution channel(s)
- Donors organisation(s)
- Others

RISKS COVERED UNDER THE PRODUCT / METHODS OF ASSESSMENT

- Main risk covered
- Secondary risk
- Tertiary risk
- Comments

POLICY TERMS

- Premium rate (% of sum insured)
- Average sum insured
- Comments
- Seasons covered
- Voluntary vs mandatory
- Is the product tied to another non-insurance product?

SUBSIDY

- Form of subsidy
- % premium subsidy per farmer
- Total subsidy used till date
- Comments

PORTFOLIO

- Total number of policies sold
- Total number of clients covered
- % women clients

- % of clients considered rural
- Total annualized gross collected premiums
- Total annualized sum insured
- Total area insured (hectare)

REINSURANCE

- % of gross premium that is ceded to reinsurer
- Reinsurance arrangement

PERFORMANCE

- Number of paid claims
- Average claim amount
- Total amount of claims paid
- Claims turnaround time (days)
- Distribution costs (commissions)
- Other expenses
- Renewal rate

[Return to Methodology section](#)



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