

# THE STATE OF MICROINSURANCE

THE INSIDER'S GUIDE TO UNDERSTANDING THE SECTOR

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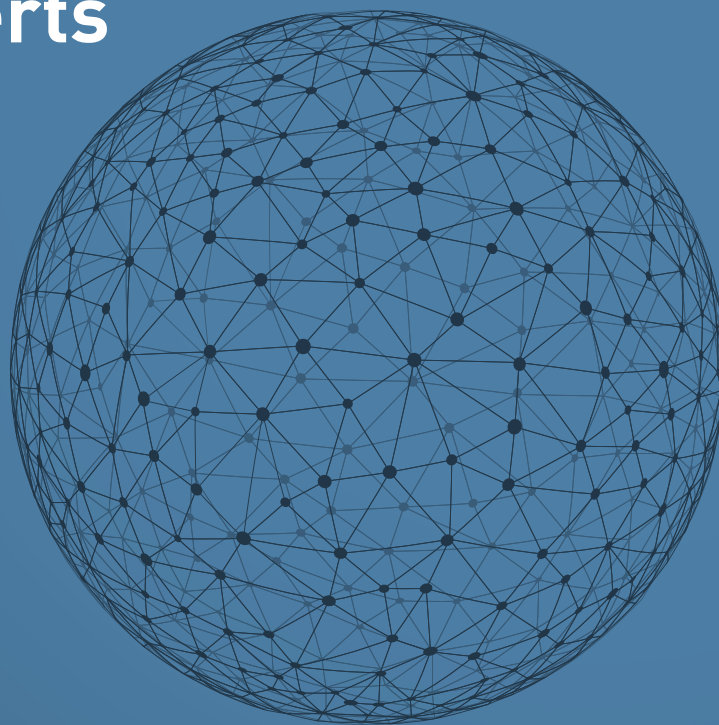
**Microinsurance  
solutions  
to address  
climate change**

**With insights from** IFAD - BlueOrchard Finance - World Food Programme - FADQDI - Grameen Crédit Agricole Foundation - GIZ - World Bank Group - Wageningen University - ILO's Impact Insurance Facility - MiCRO - Micro Insurance Academy - HDFC ERGO - Green Delta Insurance - A2ii - IRA Kenya - NIC Ghana

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# 13<sup>th</sup> International Microinsurance Conference

7-9 November 2017

Swissotel, Lima, Peru

## Inclusive insurance for the mass market



The 13<sup>th</sup> International Microinsurance Conference will take place in Peru from 7-9 November 2017. Approximately 400 participants and experts from around the world will come together to discuss and identify ways of accelerating growth and economic viability in microinsurance. The conference will be hosted by Asociación Peruana de Empresas de Seguros (APESEG), Munich Re Foundation and the Microinsurance Network.



# Foreword from the Chair of the Board of the Microinsurance Network

By Doubell Chamberlain



**Doubell Chamberlain**  
Chair of the Board  
of Directors,  
Microinsurance  
Network

**T**he role of microinsurance in climate change is not a new discussion for the microinsurance community or the Microinsurance Network.

Microinsurance Network members such as the Munich Re Foundation, the German Corporation for International Cooperation (GIZ), International Fund for Agricultural Development (IFAD), the World Food Programme (WFP), Access to Insurance Initiative (A2ii), the World Bank, Grameen Crédit Agricole Foundation, the Micro Insurance Academy (MIA) and the ILO's Impact Insurance Facility have played key roles in deepening our understanding of, and guiding our conversations on, how inclusive insurance can contribute to mitigating the impact of climate change.

The global development agenda has now taken up risk management, specifically as it relates to the management of disaster risks, reflecting a maturation of these conversations:

- The African Risk Capacity, launched in 2012 and supported by a consortium of donors led by UK AID, has now signed on 16 countries to help build their capacities to better plan, prepare and respond to extreme weather events and natural disasters, thereby protecting the food security of their vulnerable populations.
- The G7 launched the InsuResilience Initiative in 2015 under the German presidency, aiming to reach 400 million people with disaster risk protection by 2020.
- BlueOrchard, a social impact investment fund, is already two years into their Climate Insurance Fund, with a target investment of between USD 0.5 million to 5 million over 5 to 7 years.
- The insurance industry, supported by international organisations, has also come together around climate risk protection to form a public-private partnership through the Insurance Development Forum (IDF).

- The World Bank and the UK Department for International Development (DFID) are discussing how they can collaborate to address the country-level capacity needed to understand and manage climate risk.

The focus on risk management in climate change presents an opportunity for microinsurance, but there are still key challenges in implementing it in a way that improves resilience for nations, communities and households. This will require collaboration across different spheres of regulators, industry and donors. The multi-stakeholder Network has an important role in convening these different stakeholders and helping to guide this discussion going forward.

This year's third edition of our annual *The State of Microinsurance* brings together our members and other thought leaders in this space to share their knowledge, identify hurdles and provide solutions on how we can leverage the potential of microinsurance to mitigate climate change.

This edition progresses the conversation beyond risk transfer and product design, to a broader focus on integrated risk management and how countries can better prepare and respond to climate-related risks. This acknowledges a shift taking place within the Network with members increasingly focusing on the broader impact of risk on development.

Further, *The State of Microinsurance* looks forward to the implementation of these schemes and asks key questions about the capacity of governments, the relevance of innovative partnerships and best ways to improve resilience.

I am excited about the evolving nature of these discussions taking place within the Network and highlighted in this publication. I hope you are too! ■

# Foreword from the Secretariat of the Microinsurance Network

By Jenny Glaesener-Nasr



**Jenny Glaesener-Nasr**  
Senior Development  
Coordinator,  
Microinsurance  
Network, Luxembourg

I am very enthusiastic about this year's edition of *The State of Microinsurance* focusing on the theme of "Microinsurance solutions to address climate change", which proposes new insights and pioneering ideas in the way microinsurance is being designed and offered. This edition features a debate and interviews with prominent experts and practitioners in the field. It also uncovers some aspects of microinsurance pilot programmes as a tool for climate change adaptation and mitigation in Bangladesh, India, Burundi, Kenya, Mali, Senegal and Central America, as well as lessons learnt from some ongoing initiatives. The common characteristic among these programmes is that they all fall within a value proposition to the beneficiaries, have a bottom-up approach and take into account the real needs of the poor and the un(der)served.

Our planet has reached a point in history where a number of challenges need to be addressed.

**First, the climate change dilemma and its impact on natural disasters.** According to the Intergovernmental Panel on Climate Change (IPCC) and NASA, climate change models predict a few general future trends such as higher average temperature levels over most land surfaces, leading to increased risk of droughts, increased intensity of storms, higher wind speeds in tropical cyclones and a wetter Asian monsoon. While all natural disasters cannot be blamed on climate change, they have and will certainly be amplified by global warming to an extent still unknown.

**Second, populations living in disaster-prone areas.** Last year alone, the lives of 102 million people were devastated by natural catastrophes, and the vast majority had no risk insurance to help them manage their lives after the shocks occurred. In low and middle income countries, as much as 90% of economic losses resulting from natural hazards were uninsured. While risk insurance is not the only solution, it is part of a cost-effective response package to vulnerable populations to enhance their

resilience and livelihoods on one side, and to affected governments on the other, easing their reconstruction and recovery measures and expenses. According to the United Nations' International Strategy for Disaster Reduction (UNISDR), 606,000 people died and 4.1 billion people were injured or left homeless between 1995 and 2015 due to weather-related disasters. The human impact has been mostly felt in Asia with 332,000 deaths and 3.7 billion people affected.

**Last but not least, food security and agriculture.** 70% percent of all food consumed worldwide is produced by smallholder family farmers, making up one third of the world's population. Today, 2.5 billion people live and work on 500 million smallholder farms, each less than two hectares (20,000 sqm). While these farmers should ideally have adequate financial security and good livelihoods, because they hold the world's food security in their hands, they on the contrary, lead a life of everyday struggle because of a) limited access to agricultural inputs (seeds, fertilisers, water, agrochemicals, agricultural tools and machinery), b) limited access to markets, c) extreme and increasingly unexpected weather events affecting their production, and d) lack of insurance protection.

In a bid to decrease the inherent risks implied in smallholder farming, various agricultural insurance pilot schemes have been introduced in a number of countries, which help farmers build their resilience against shocks, enhance their livelihoods and sustain their mission of feeding an additional 2 billion more people by 2050.

The Secretariat of the Microinsurance Network hopes you find this year's edition of *The State of Microinsurance* a stimulating and productive read, and that the ideas and proposals presented herein will help lay an additional brick in the construction of a sustainable, efficient and productive microinsurance system to the benefit of both the industry and the end clients. ■

## Interview



# Francesco Rispoli, IFAD

Conducted by **Jenny Glaesener-Nasr**, Senior Development Coordinator, Microinsurance Network

### Francesco Rispoli,

Senior Technical Specialist, International Fund for Agricultural Development (IFAD), Italy; Member of the Board of Directors, Microinsurance Network

*Agricultural index insurance has observed rapid progress in recent years compared to the indemnity-based approach. This is because data collection and product design have greatly decreased transaction costs. However, some constraints still remain in upscaling pilot programmes and addressing implementation challenges. Francesco Rispoli provides us with a hands-on assessment of this tool as a means to reduce poverty, enhance livelihoods of smallholder farmers and address climate change effects.*

### *What, in your opinion, is the main constraint for scaling up agricultural index insurance programmes beyond pilot stages?*

**Francesco Rispoli:** There is consensus that insurance needs to be part of a broader agricultural development strategy which governments implement at country level.

The challenges for index insurance to scale up and be sustainable can be classified into two categories: **Technical challenges and operational challenges**. Developing index insurance products requires **capacity and expertise**, which is not widely available, and less so at the country level. Another key challenge is **basis risk**, which is the mismatch between actual loss and the compensation received by the farmer. The need for **good-quality agricultural data** is another issue that all programmes and insurance companies engaged in index insurance face when they have to design an index-based product. The lack of reliable data is an issue for creating reliable products and scaling up. For example, area-yield index insurance and weather station-based index insurance both rely on historical data and current yield data to create a product and assess compensation when losses occur. Even indices based on satellite data benefit from some ground data. There are also **operational challenges**, such as distribution, which are sometimes even more crucial than the product itself. Delivering at scale and low cost, and providing added value, by bundling index insurance with other products, for instance, are important hurdles. All these issues can undermine the scalability and sustainability of index insurance products, if not approached in the right way.

### *Is special actuarial expertise needed to design an agricultural index insurance product?*

You need a wide range of expertise in order to design an agricultural index insurance product, as well as specific actuarial expertise. You need strong knowledge of agriculture and **agricultural production**, and expertise in understanding how to use and analyse agricultural data (yield, weather, and/or satellite data), which is not easy to have all together within an insurance company. There is often a lack of **technical expertise or ownership** within insurance companies themselves at country level. Many of the agricultural indices have been developed with external support or together with **insurance brokers** based in the region, for example in West and East Africa.

Because index insurance products need to be tailored to each location and possibly to each specific crop, **development costs** are quite high. This means insurers can also be unwilling to make these initial investments themselves in the market.

### *Agricultural index insurance sounds very complex to implement. However, in some cases it has been scaled up and there are some successful programmes out there. Why, in your opinion, have they been successful?*

The programmes that have reached some level of scale are those providing a value proposition for farmers, using already existing infrastructure and a relationship of trust with the client. In order to reach scale, you need **aggregators** such as **Microfinance Institutions (MFIs), farmer cooperatives, input suppliers** and retailers. You also need to **bundle** the index insurance product with other services, so that insurance becomes a part of a farming package.

One good example of this, is **PepsiCo** in India, where the leading manufacturer of the potato chips industry in the country is sourcing potatoes from smallholders and also providing insurance as a service to these farmers. As a whole package to farmers, the company provides technical support, weather information, access to quality inputs, index insurance and access to market (as PepsiCo buys back the produce at a higher price).

There are also other cases where the policyholder is the federal government, such as **CADENA** – Mexico’s Committee for Natural Disasters and Emergencies – which uses index insurance to provide coverage against catastrophes at state level. Vulnerable smallholder farmers receive insurance compensation in the event of a disaster, rather than waiting for aid from the government.

There are different elements of success, but since distribution remains a challenge, the most successful programmes are those that managed to leverage existing infrastructure and trusted relationships between the beneficiaries and value chain actors.

### *Do you think that in the future, index insurance will replace traditional agricultural insurance, which is indemnity-based?*

There is consensus that agricultural insurance can play a role as part of a **holistic approach for agricultural development and disaster risk management**. It is part of a strategy that can increase the resilience of herders and farmers, as well as support sustainable increase in productivity, unlocking access to other services, such as credit.

The most widespread type of indemnity-based agricultural insurance is Multi-Peril Crop Insurance, however, there are some challenges in offering it to smallholders, linked to the fact farm visits that are needed to set up coverage and determine the damage. Because it is based on an indirect indicator or a proxy for loss, **index-based insurance** can offer promising solutions for smallholder agriculture. The key advantages are that it can reduce administrative costs, and the risks of moral hazards, adverse selection and asymmetric information. Because the product is standardised, it can be bundled with other services, such as credit or inputs, and delivered through aggregators. It also protects against covariate risks, which affect many people in the same area simultaneously. Despite that, the type of product depends on need and feasibility, and as mentioned earlier, index-based insurance faces a number of technical and distribution challenges that the insurance industry is continuously exploring.

### *How is IFAD, as an international organisation, supporting agricultural index insurance for smallholder farmers?*

IFAD recognises that insurance plays an important role in broader agricultural development and agricultural risk management strategies. IFAD has been strongly focusing on rural areas and smallholder farmers through its investments in rural development programmes and projects, together with its government partners. It is in this context, that IFAD has been focusing on the **relevance of index insurance**, exploring what the required ingredients to reach scale and sustainability are.

At IFAD, we realise there are challenges to overcome and we recognise that the engagement of the public and private sectors, together with the donor community can contribute to the development of sustainable insurance markets. For agricultural index insurance in particular, you need important public goods to be in place, which should be supported by the government, such as reliable agricultural data (including weather data, production data, yield statistics etc.). For this, solid infrastructure is needed to collect reliable, timely data, in order to develop and operate insurance products. Without this data, the product quality can substantially decrease. In addition, it is important to stress that in underdeveloped markets, development costs of such products are prohibitive for the private sector and could be supported by governments and donors.

### *Why is index insurance still low on the demand side? What is needed to counteract this trend?*

Governments have an important role in improving farmers’ awareness of the existence and **role of insurance**. This is applicable to all insurance products, not least index insurance. An increased awareness will help develop an informed decision, which can enhance insurance uptake. As part of their **financial inclusion strategy**, governments can definitely support in creating awareness and facilitating access to financial instruments, including insurance. It is also important to link insurance to other services and, as I said before, make insurance part of a broader **value proposition** to farmers.

### *And what about the supply side? How can we motivate more players to get involved in the index insurance space?*

In a nutshell, the supply of index insurance products involves a number of **technical and operational challenges**, such as the low capacity in insurance companies to **develop and customise indices**. There are high costs linked to development, especially as a first mover in developing markets, and feasibility needs to be assessed as a starting point. In addition, these products often need adaptation from crop to crop and area to area. Information is needed on agricultural and weather data, as well as crop characteristics including planting seasons and the way the crop behaves when confronted with risks, such as extreme weather conditions. Supporting development costs, information systems and capacity building is where the public sector can play a role in private market development. Overall though, it is not just about the quantity of supply, but attention should also be paid to quality, in order to ensure sustainability.

### *How can index insurance be used as a tool to combat the consequences of extreme climate events?*

Index insurance can contribute to adaptation to climate change, but it is not in itself a solution to climate change. Insurance can play a role in supporting adaptation pathways.



For example, some governments are participating in sovereign risk regional pools, such as the African Risk Capacity and the Caribbean Catastrophe Risk Insurance Facility to manage widespread weather risks, which are increasing in frequency and severity due to climate change. In these pools, the policyholder is the government. The governments get the payouts when there are extreme weather events, and they distribute the benefits to the most affected smallholders.

This type of risk pooling helps governments intervene quickly and efficiently after climatic shocks occur. However, index insurance is not just a relevant tool for climate adaptation and disaster risk management, but also for agricultural and rural development for example, by encouraging access to other financial products or helping to reinforce value chains.

BMZ and KfW present



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COMING IN JULY



# The Climate Insurance Fund: Facilitating private sector responses to climate risk in the developing world

By Lisa Sherk and Lado Jobava



**Lisa Sherk**  
Head of Social Performance Management, BlueOrchard Finance Ltd., Netherlands



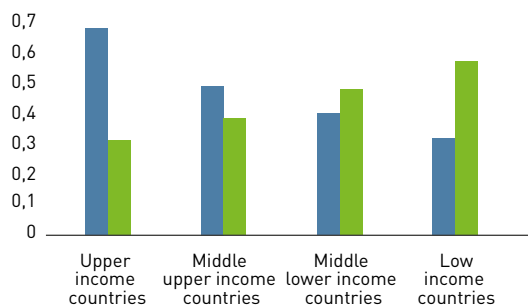
**Lado Jobava**  
Investment Officer, BlueOrchard Finance Ltd., Georgia

The impact of climate events disproportionately affects populations in developing countries. Often located in geographies that are already highly vulnerable to adverse weather and natural disasters such as droughts, floods and typhoons, these economies also lack the infrastructure that can provide resilience and protection to local populations and their assets. In addition, as developing country economies are typically highly dependent on agriculture and natural resource-based sectors, natural disasters – which impact such sectors directly – can have strong ripple effects throughout the economy. The Climate Insurance Fund (CIF) was launched in 2015 by the German Development Bank KfW, on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and is managed by the Switzerland-based impact investment manager BlueOrchard Finance in partnership with weather risk management specialist CelsiusPro. It was created precisely to address these vulnerabilities. The underlying premise of the fund is that insurance providers, and insurance-related

initiatives, can play a critical role in mitigating the adverse impacts of extreme climate events on poor and vulnerable populations. Insurance payouts reach people much faster than emergency relief operations and, more importantly, insurance can incentivise people to implement effective adaptation measures. But while insurance can effectively complement existing risk management strategies and reduce the vulnerability of countries and their populations towards natural catastrophes, access to such insurance is very limited, particularly in developing economies. The focus of CIF is therefore to help develop and foster the growth of these vital products and services.

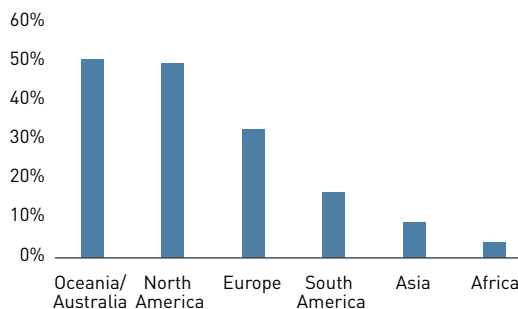
Developing countries have both high vulnerability and limited readiness to cope with the impacts of climate change. Figure 1 summarises the vulnerability to climate change and readiness to improve resilience based on results from the University of Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index, whose objective is to help businesses and the public

**Figure 1: Vulnerability and climate change readiness scores by country income levels (Jan. 2017)**



\* Based on the methodology of the Notre Dame University Adaptation Initiative. For more details, please see [index.gain.org](http://index.gain.org)

**Figure 2: Percentage of insured disaster losses by region (2000-2016)**



Reference: Natural catastrophes 2016: Analyses, assessments, positions, 2017. Topics Geo 2016. Munich Re.

■ Readiness ■ Vulnerability

sector better prioritise investments for a more efficient response to global challenges. Figure 2 shows the levels of insured disaster losses by region.

In this article, we first provide a background on several important public sector macro initiatives to address these issues at the sovereign level. We then explore how CIF complements such initiatives through its activities both at the micro level (promoting direct coverage for small businesses, farmers and the working poor) and at the meso, portfolio level –with disaster risk coverage for broader exposures of private sector participants in vulnerable regions. In all its activities, CIF promotes the active involvement of the private sector – including institutional investors – with the goal of achieving long-term sustainability in the provision of products and services to build up more resilience for the poor and vulnerable against the impacts of climate events.

## Public Sector initiatives

The **G7 Initiative on Climate Risk Insurance (“InsuResilience”)** adopted at the G7 Summit in Elmau, Germany in June 2015 – and further strengthened at the 2016 COP22 meeting in Marrakech – aims to increase access to direct or indirect insurance coverage against the impacts of climate change for up to 400 million of the most vulnerable people in developing countries by 2020. This initiative is being implemented in close partnership between the G7 states, the EU and the Netherlands, with developing countries and emerging economies. So far, USD 550 million has been pledged to enable climate risk insurance coverage for at least 180 million people.

InsuResilience supports a range of important insurance-related facilities and initiatives, including the Climate Insurance Fund specifically, as well as the following public sector initiatives:

**African Risk Capacity (ARC):** ARC is a macro facility that enables African states to pool capacity in order to mutually cover themselves against drought and other perils in future. A special feature of ARC is that each government prepares an emergency response plan in which it defines in advance how insurance payments are to be deployed in the event of disaster.

**The Caribbean Catastrophe Risk Insurance Facility (CCRIF):** CCRIF provides short-term liquidity to participating governments when the policy is triggered by a catastrophe. The facility provides cover for hurricane, earthquake

and excess rainfall, and uses a parametric mechanism to trigger a payout whenever a pre-defined modelled loss level is reached. By pooling the capacity of its members, CCRIF serves as a mutual risk taker and can provide insurance coverage at a comparatively low premium for otherwise mostly uninsured catastrophe risks borne by sovereigns.

**Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)** offers insurance products to cover tropical cyclones and earthquakes in the Pacific Islands.

**Climate Risk and Early Warning Systems (CREW):** The CREWS initiative aims to significantly increase the capacity for Multi-Hazard Early Warning Systems.

Another important public-sector initiative is the **Global Index Insurance Facility (GIIF)**, a multi-donor trust fund – part of the World Bank Group’s Finance & Markets Global Practice – which works with various private and public partners to further develop and implement index/ catastrophic insurance in developing countries. GIIF’s objective is to expand the use of index insurance – insurance where payouts to policyholders are triggered by specific extreme weather or disaster events as opposed to assessing actual damages incurred – as a risk management tool in agriculture, food security and disaster risk reduction.

## The Climate Insurance Fund (CIF)

It is against the backdrop of these various developments that CIF was created, with a focus on helping private sector players develop long-term climate insurance solutions. The specific objective of the fund is to reduce the vulnerability of low-income households as well as micro, small and medium enterprises (MSMEs) to extreme weather events. As such, CIF supports private companies involved in the value chain of insurance (mostly insurers, brokers, reinsurers and insurance distributors) to develop a climate insurance offering for low-income populations in Official Development Assistance (ODA) recipient countries. The fund is an impact fund with a dual objective: social impact and return. While only in operation for a little over two years, CIF has already invested in institutions embarking on innovative, scalable initiatives in the area of climate insurance.

Leading reinsurers such as Swiss Re, Hannover Re and Munich Re are supporting the Climate Insurance Fund as business partners. These



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business partners provide non-exclusive support to the Fund with product design, underwriting capacity and industry contacts to successfully develop, expand and scale up the climate insurance offerings of investees.

The majority of CIF investments focus on the micro level, with the aim of expanding the availability of affordable and effective risk management products for MSMEs, individual farmers and the working poor. In its initial stage, CIF has made mostly debt investments, supporting microfinance institutions and banks that are looking to develop or further expand existing insurance products for their clientele, particularly in agrobusinesses, as well as equity investments in companies involved in developing innovative insurance and financial disaster risk management offerings. The fund also has a pipeline for equity investments in insurance companies, brokers and reinsurers active in climate-related insurance products in the developing world.

Other CIF investments aim at providing **meso-level** coverage, supporting investees that provide risk management products at a portfolio level for actors – including private sector companies, non-profits, and development organisations that serve poor and vulnerable populations – with exposures in the developing world. The availability of such portfolio-level disaster risk coverage both protects such organisations from

losses and also enables greater investment in regions that are vulnerable to climate events.

In this context, it is interesting to note developments that facilitate portfolio-level coverage in managing natural catastrophe risk in developed countries' financial markets. **Insurance Linked Securities (ILS)** have, since the late 1990s, grown in importance in insurance markets for natural catastrophe risks. ILS are tradeable financial instruments that facilitate the transfer of specific risks from the exposed party (sponsor) to investors. Catastrophe bonds (CAT bonds), a form of ILS tailored to catastrophic risks, represent a strong growth sector within this market. Investments in CAT bonds are popular for pension fund managers as a source of portfolio diversification because insurance payouts linked to natural disasters – which determine the value of such bonds – are typically uncorrelated to movements in general financial markets. One of the CIF investees, Global Parametrics, plans to use CAT bonds to manage exposures that they take on in developing countries. For example, strong El Niño patterns create extreme weather events (drought and flooding) in these countries. By contrast, the risk of hurricanes off the eastern seaboard of the United States are significantly lower during strong El Niño years. As a fund manager of a uniquely positioned Natural Disaster Fund ("NDF"), Global Parametrics plans to blend exposures in developing countries with those in

developed countries to create efficiencies and as part of an important aspect of creating more opportunities for global insurers to increase their offerings in developing countries.

An important component of CIF is its technical assistance (TA) facility, managed by Swiss-based weather and climate insurance specialist, CelsiusPro. It is important to emphasise that climate insurance remains vastly underdeveloped in most markets. In this development phase, technical assistance can therefore provide crucial know-how and expert assistance in product development, marketing and service delivery.

An early recipient of technical assistance from CIF was a Peruvian financial institution, Caja Municipal de Ahorro y Crédito (CMAC) Sullana. Caja Sullana has a strong reputation in the market for providing credit and saving products for micro and small businesses for more than 30 years. Almost its entire portfolio is placed in coastal regions of the country, with more than half in the northern regions of Peru, the most exposed area to adverse weather. While Peru is exposed to a number of climate and natural catastrophe risks, insurance products covering these risks are not yet well-developed. Caja Sullana recognised that adverse weather is a potential risk for their clients and ultimately for their core business and thus decided to start offering agriculture insurance. It started with two products with a climate component: The Multi-Risk Insurance for SMEs (Seguro Multirriesgo PYMES) and a more recent offering – the Agriculture Crop Insurance (Seguro Agrícola Cosecha). Both are offered in partnership with La Positiva, an independent Peruvian insurance company.

The focus of the TA intervention was to strengthen knowledge about climate insurance among both Caja Sullana's staff and end clients, to expand the effective outreach of such products and, ideally, to create capacity for the development of tailor-made insurance products adapted even more to client needs. Again, it is important to highlight that in a nascent

market such as climate insurance, knowledge of such products is very limited among market participants and educating both providers and beneficiaries is critical. The first phase of this TA project therefore focused mostly on improving knowledge about the insurance product and heightening awareness – both among staff and clients – on how such products can provide added value to clients. A second TA phase is currently being designed to incorporate the feedback from phase one to help in moving the market forward by improving and extending the current available climate insurance offering.

In other CIF TA projects, Celsius Pro has managed feasibility studies for several banks located in developing countries to determine how such institutions could most effectively develop and market climate insurance products. After assessing the market, the next steps will be product development and roll-out.

CIF's overall aim is to complement the efforts of the international community and donors to the public sector with support geared towards the development of a sustainable insurance industry in developing markets, providing sorely needed cover against climatic risks. While many other climate risk initiatives provide support to government-focused or clean energy programmes, there is no other initiative that we are aware of that focuses on investment capital, technical assistance and premium subsidy funds to expand climate insurance through private sector channels to support the business sector and low-income households.

With the clear vulnerabilities of developing world populations to climate events, it is critical to develop suitable, affordable and effective solutions to help mitigate such risks. CIF, even in its few years of operation, is already supporting innovative climate insurance schemes and will continue to build on this knowledge to further invest in private sector initiatives, spurring the long-term development of climate insurance markets for poor and vulnerable groups globally. ■

# An integrated risk management approach against climate risks: The R4 Rural Resilience Initiative in Senegal

By Mathieu Dubreuil and Arianna Tabegna



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Food Programme, Italy

Recently, microinsurance has been a topic of debates on whether it can be a successful tool in the context of climate change. The R4 Rural Resilience Initiative (R4), an integrated risk management strategy which includes microinsurance as one component, has been able to limit the effects of climate shocks on the food security of vulnerable farmers. Indeed, an impact evaluation of R4 Senegal including the Food Consumption Score (FCS) - World Food Programme's (WFP) core indicator for measuring of food security<sup>1</sup> - shows the positive effects of this approach. WFP's method to analyse food security has two parts: (i) the construction of a FCS and (ii) the classification of the food security status based on the FCS. This article seeks to show how microinsurance can have a significant impact in addressing the effects of climate change when appropriately embedded in a wider risk management strategy.

In Sub-Saharan Africa, farmers' food security is constantly threatened by natural disasters or climate shocks, such as droughts or dry spells. By increasing the frequency and intensity of such events, climate change is further increasing farmers' vulnerability. Building resilience has therefore become crucial for vulnerable farmers to achieve and maintain food security and secure their livelihoods.

## Background

Forty-six percent of the Senegalese population lives below the poverty line. Its economy is heavily reliant on agriculture, a livelihood highly influenced by climate risks<sup>2</sup>. Food insecurity caused by delays in the start or early cessation of rains and long dry spells during the growing season affects subsistence farmers. They are unable to invest in their land, and improvements in agricultural productivity and rural income are hindered. Although the Government recognised microfinance - both credit and savings - as a major instrument for poverty reduction, poor and isolated rural communities are often unable to access it<sup>3</sup>. Indeed, MFIs have a limited presence in rural areas, and their interest in financing agriculture remains low, particularly outside the major value chains.

R4 was launched in Senegal in 2012 by WFP and Oxfam America after a successful pilot in Ethiopia. The initiative started in 2013 in



**We are ready to pay insurance by cash even if the project ends because it is a guarantee in case of rainfall deficit. The fact that we did not receive compensation did not discourage us. Having a good harvest is better than having an indemnity.**



Women participants in Kolda region

- 1 Bassett L., Benson T., Hoddinott J., & Wiesmann D. (2009). Validation of the World Food Programme's food consumption score and alternative indicators of household food security. *International Food Policy Research Institute (IFPRI)*, 00870, 91.
- 2 World Food Programme. (2017, January). *The R4 Rural Resilience Initiative in Senegal Comprehensive Climate Resilience for Long-Term Food Security and Livelihoods*. Retrieved from <https://docs.wfp.org/api/documents/e4caf70dd102456ab48d88b9964d72cf/download/>.
- 3 World Food Programme. (2012). *R4 Rural Resilience Initiative. Consolidated National Assessment: Senegal*. Retrieved from <https://www.oxfamamerica.org/static/media/files/r4-senegal-national-assessments.pdf>.

Koussanar and subsequently expanded to Tambacounda, Kolda, and Kaffrine regions. In 2016, it reached over 12,000 farmers in areas most vulnerable to climate shocks in Senegal. Weather-index insurance is offered to farmers through the National Agricultural Insurance Company of Senegal (CNAAS) and delivered through savings associations. In early 2016, a total of 3,334 farmers out of the 3,621 who had accessed insurance received over USD 80,000 in payouts following the rainfall deficit in the start of the 2015 season.

R4 aims to strengthen the resilience of smallholders vulnerable to climate shocks with a combination of four risk management strategies:

- Improved resource management through asset creation (risk reduction)
- Microinsurance (risk transfer)
- Livelihoods diversification and microcredit (prudent risk taking) and
- Savings (risk reserves).

In this set of strategies, index-based insurance offers an innovative risk financing mechanism to enable farmers to anticipate and cover potential losses caused by poor rainfall and failed harvests. Protected by insurance, farmers engage in disaster risk reduction and asset creation activities, and participate in trainings on asset creation, insurance, saving and credit, aiming to limit the negative impacts of climate shocks and increase food production, food security and capacity to produce surpluses. The innovative aspect of this approach lies in the ability of vulnerable farmers to access insurance by engaging in asset creation activities through R4's Insurance for Assets (IFA) scheme which builds their communities' long-term resilience. Activities include the rehabilitation of low-lying lands for rain-fed rice cultivation, compost pit making, the construction of dykes, stone barriers and dams, and the creation of vegetable gardens.

The index, designed by the International Research Institute for Climate and Society (IRI)

at Columbia University, with the increasing engagement from local stakeholders (CNAAS, PlaNet Guarantee, Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM) and the Institut Sénégalais de Recherches Agricoles (ISRA)) is based on rainfall estimates. The Social Network for Index Insurance Design (SNIID) methodology is used to develop the index and product's structure involving local communities. The index captures the very worst rainfall events experienced by the community in a given range of years, covering a basket of crops as farming practices are still too weak and heterogeneous to justify a crop-specific product (planting dates can differ by several weeks).

Furthermore, farmers participate in savings groups that save regular amounts of money, allowing farmers to borrow money at a given interest rate to cover unexpected expenditures. Lastly, a revolving credit fund was set up in partnership with a microfinance institution that provides credit to savings groups to enable members to engage in income-generating activities.

## Impact evaluation

To demonstrate the positive impact that R4 Senegal has had on its participants, this article presents the main findings of an impact evaluation of the programme undertaken in 2015 and 2016. The assessment focuses on the food security of R4 participants and non-participants taken in consideration by this study.

After three years of implementation, R4 Senegal was analysed through a method of "double difference" or "difference in difference"<sup>4</sup> and desk-based research together with focus group discussions (FGDs), to assess its results on participant farmers ('Group A') and comparing them to non-participant ('Group B') all highly vulnerable to climate shocks. The surveys were conducted in three different time periods since the beginning of the pilot (Table 1).

**Table 1:** The sample group of R4 Senegal impact evaluation programme

Location	Period	Number of households	Number of participants	Number of non-participants
Tambacounda	March 2015 - March 2016	785	616	167
Koussanar	March 2013 - March 2015 March 2015 - March 2016	382	205	177
Kolda	March 2015 - March 2016	451	316	135

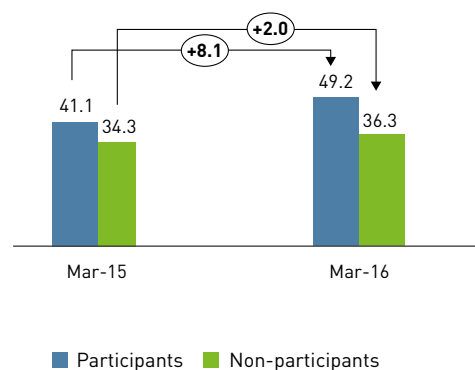
<sup>4</sup> This method involves comparing performance of both programme participants and non-participants across time horizons on a range of indicators and assessing the difference between changes in both groups.

By comparing the years 2015 and 2016, it appeared that both R4 participants and non-participants improved staple crop production in 2016, when people faced a severe drought. Nevertheless, Group A achieved significant higher yields. This resulted from the asset creation component, which includes the development of lowland rice fields and the implementation of improved water management techniques. More specifically, the average volume of rice produced per participant household increased by 91 percent from 2015 to 2016, compared to a 42 percent increase for non-participant households. Similarly, the production of millet increased by 86 percent for the programme's farmers, while for non-participants the increase was only 43 percent. Through FGDs, it appeared that R4 participants were able to enhance their use of fertiliser through training in compost pit making, as well as the credit from savings groups leading to positive results for their crop production. Additionally, the credit component together with a higher production of crops for livestock feeding led to an increase in livestock ownership for R4 participants, while non-participants saw a decrease. A 20-percent increase of households participating in the cultivation of vegetable gardens for Group A against a six-percent increase for Group B was also noted, which means that R4 farmers cultivate and consume more vegetables than the control group.

Improved staple crop production and an increase in livestock ownership and in the cultivation of vegetable gardens likely contributed to improved Food Consumption Score (FCS)<sup>5</sup>, as the FCS is based on dietary diversity, food frequency, and relative nutritional importance of different food groups<sup>6</sup>. Indeed, the analysis of the FCS of Group A and Group B correctly showed that while both of them increased, participants saw a four-fold increase of their FCS compared to non-participants between 2015 and 2016. More specifically, participants' FCS increased from 41 to 49 points, while the non-participants' increased from 34 to 36 (Figure 1). Thanks to higher food production and food assistance from R4, in 2016, 61 percent of participants had an

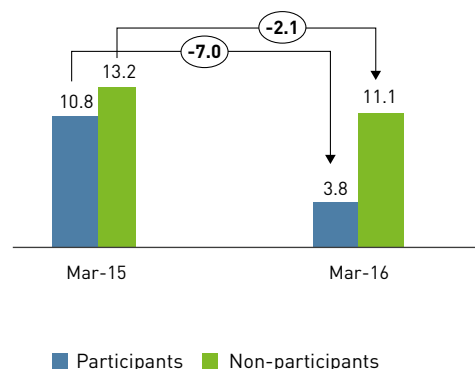
acceptable FCS based on WFP's categorisation compared to 36 percent of non-participants.

Figure 1: Change in food consumption score



Greater availability of food means that people are less likely to resort to negative coping strategies, which include consuming cheaper and less nutritious food and in less quantities, and this is reflected in the Coping Strategy Index (CSI)<sup>7</sup> analysis. In fact, despite both groups experiencing a reduction in their CSI, R4 participants experienced a seven-point reduction in their coping strategy index compared to a reduction of two points among non-participants (Figure 2).

Figure 2: Change in Coping Strategy Index (CSI)



5 FCS is a proxy indicator of household food security based on the weighted frequency (number of days per week) of intake of eight different food groups. FCS captures both elements of food security: quality (different food groups/dietary diversity) and quantity (food frequency). Households with an FCS of at least 42.5 are classified as "acceptable" while those with an FCS of between 28.5 and 42 are classified as "limited" and households below 28 FCS are considered "poor".

6 Vhurumuku, E. (2014, February). "Food Security Indicators". *Food and Agriculture Organization*. Retrieved from [http://www.fao.org/fileadmin/user\\_upload/food-security-capacity-building/docs/Nutrition/NairobiWorkshop/5.WFP\\_IndicatorsFSandNutIntIntegration.pdf](http://www.fao.org/fileadmin/user_upload/food-security-capacity-building/docs/Nutrition/NairobiWorkshop/5.WFP_IndicatorsFSandNutIntIntegration.pdf).

7 CSI measures the frequency and intensity of households' behaviour to cope with food shortages. Households having a higher CSI use coping strategies more frequently and intensively due to greater vulnerability. CSI is typically inversely proportional to FCS.





As the case study showed, because of predictable income and increased food production, farmers reduced their negative coping strategies and were encouraged to invest in activities and technologies with higher return rates. Most importantly, in R4, the efficacy of microinsurance takes a step forward because the insurance product is integrated in a risk management approach. While insurance is not a “silver bullet” as a standalone, its impact can be significant when embedded in a wider risk management strategy and can strengthen the effects of the strategy itself<sup>9</sup>.

By integrating microinsurance with asset creation, savings and prudent risk taking, R4 Senegal showed how microinsurance can have a significant role in building medium to long-term resilience amongst vulnerable communities against extreme weather events.

These results allow us to state that R4 did indeed enable participants and their households to maintain their food security during climate shocks. Participants experienced a diversified and sufficient food consumption level, while reducing their coping strategies despite unfavourable climate conditions hitting their communities.

Microinsurance provided a key contribution to the success of R4, putting in practice what has been extensively discussed in the literature on the role of microinsurance<sup>8</sup>. Indeed here, (i) the insurance covers for crop losses, the main source of income and livelihoods of the participants, and therefore corresponds to the real needs of those exposed to risks; (ii) the product is accepted by the climate-vulnerable smallholders as it covers lower-frequency extreme events; and (iii) the targeted people are able to pay for insurance thanks to the innovative IFA scheme.

R4 has been implemented through a test-learn-iterate approach for developing lessons learned to further improve programming and inform expansion. For instance, transferring capacity to local stakeholders is essential for the sustainability of the initiative. Additionally, addressing basis risk is pivotal, as it is an inherent challenge to index insurance programmes that can generate farmers’ mistrust of the insurance product and of the overall initiative. R4 has worked towards minimising this risk for its participants by continuously improving the indexes; strengthening the risk reserves component as a buffer for non-extreme events; developing rigorous basis risk fund mechanisms in each country; improving farmers’ understanding of indexes and of trade-offs in insurance products. As a conclusion, it has been found that better access to market and a stronger integration of value chains would leverage the improvement of farmers’ livelihoods. ■

8 Loster, T. & Reinhard, D. (2010). Microinsurance and Climate Change. In *Microinsurance: An Innovative Tool for Risk and Disaster Management* (pp. 39-42). Global Risk Forum GRF Davos.

9 Steinmann, R. (2012). Climate change: a microinsurance perspective. *Microinsurance Network*. 002, 10.

# Area-yield index insurance for rice in Mali: Findings from a pilot phase

By Jonathan Boudreau, Marie-Christine Bélanger and Réналd Levesque



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Almost 40 years ago, at the 7<sup>th</sup> African Insurance Conference, Mr. Robert Crowe<sup>1</sup> made a convincing advocacy speech for the implementation of crop insurance in developing countries, focusing notably on its potential benefits. Since then, many pilot projects have been tested in African countries including Burkina Faso, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Senegal, Tanzania, Uganda and Zimbabwe. According to Miranda & Mulangu [2016]<sup>2</sup>, although the results of these projects were in many cases disappointing, the development of index insurance should be encouraged, especially as a means to support agricultural production and credit development.

In 2015, Global Affairs Canada granted Développement International Desjardins (DID) and Financière agricole du Québec – Développement international (FADQDI) the financial support needed to implement a project titled "Agricultural and Rural Finance in Mali" (FARM). This project aims at increasing the access of Malian farmers to financial services by reducing their exposure to risks. Among the activities included in the project are capacity building of financial institutions, development of specific credit analysis methods tailored to the agricultural sector and development, testing and implementation of risk coping mechanisms such as crop insurance and guaranteed loan programmes. The FARM project began in April 2015 and will be in effect until December 2019.

**This paper presents the findings of the development and testing of a crop insurance programme offered to rice producers in the Ségou region of Mali.** The designed crop insurance corresponds to an area-yield index insurance. The choice of an area-yield index insurance to cover the risks faced by agricultural producers in Mali was first introduced in 2011,

in a feasibility study for the implementation of crop insurance in the West African Economic and Monetary Union (WAEMU) conducted by AECOM and FADQDI. This option was confirmed in the early stages of the FARM project by the identification and analysis of the main agricultural commodities of Mali. The resulting report allowed for a better understanding of the geography and climate of Mali, as well as the particularities of its agriculture and insurance sectors. An analysis of the risks affecting the crops cultivated in the country was also realised. The report concluded that the development of an area-yield index insurance was not only feasible but much needed for the sound development of the Malian agricultural sector.

Area-yield index insurance relies on the definition of homogeneous production areas. Within each insurance area, the protection is based on historic datasets of yields. Premiums are determined following a risk analysis performed on these historical datasets. Loss assessment is conducted collectively within an insurance area. The yields are measured by samplings, declarations, field and climate observations or by a combination of these methods. When the actual yield falls below a given threshold, a payout is triggered for all the insured farmers located in the affected area.

Index insurance helps avoid moral hazards and reduce adverse selection. The main issue remains the basis risk, caused by the measurement of an index that could be not too well correlated with the losses affecting the insured producers. The development of a good sampling plan for the area-yield index insurance makes it possible to reduce this basis risk. Collection of yield samples (crop cuttings) and survey data by field agents to determine the actual yield is costly but provides

1 Crowe, R. (1980, February 11-15). "Crop insurance for developing countries". *Seventh African Insurance Conference*. Retrieved from [http://unctad.org/en/PublicationsLibrary/unctadinsd41\\_en.pdf](http://unctad.org/en/PublicationsLibrary/unctadinsd41_en.pdf).

2 Miranda, M. J. & Mulangu, F. M. (2016). Index Insurance for Agricultural Transformation in Africa. In *African Transformation Report 2016: Transforming Africa's Agriculture* (pp. 29).

valuable statistics that can be used by the main actors involved in the development of the agricultural sector. Moreover, these agents have the opportunity to inform farmers about the insurance product and promote good agricultural practices. These aspects give area-yield insurance an advantage when compared to weather-index or satellite-based index insurance.

The objective of microinsurance is obviously to provide a valuable product at a price that is not dissuasive. The design of an efficient process is therefore one of the main challenges to address when implementing this type of solution. In order to provide Malian farmers with an efficient crop insurance programme, FADQDI executed a pilot testing of the area-yield index insurance from May to December 2016. The activities were realised with the participation of several local stakeholders in order to test the proposed management process and demonstrate that it is possible to deliver area-yield crop insurance at an affordable cost. All of this with the final objective to offer this insurance scheme at a larger scale in Mali.

The first step was to determine the pricing of the insurance and its main parameters (premium, threshold, unit price, guarantee level, etc.). This was done by undertaking a complete risk analysis of the targeted areas using local data.

**Historical yield data collection** was the first challenge to address. Yield data is collected every year by state agents and service providers. While results for each survey area are centralised, raw data is not always easily available. Final results for a region, a "cercle", or a commune<sup>3</sup> provide a good overview of the production levels and of the

frequency of losses. Raw sampling data allows to analyse yield variability within the sampling areas and to delineate homogeneous areas for index insurance. Raw data also allows to refine risk analysis and the definition of insurance parameters. Several visits to local offices of the Office du Niger (ON) and the Agriculture Regional Department (DRA) of Ségou were required in order to get access to historical raw sampling data. The Office of Planning and Statistics of the Rural Development Sector (CPS/SDR) now centralises raw data that has been collected for up to four years in some areas. This centralisation simplifies the update of insurance parameters each year.

After completion of the insurance main parameters development, adapted training material was prepared and delivered to the local stakeholders involved in the experimentation. Overall, the proposed area-yield index insurance relies on a four-step management process:

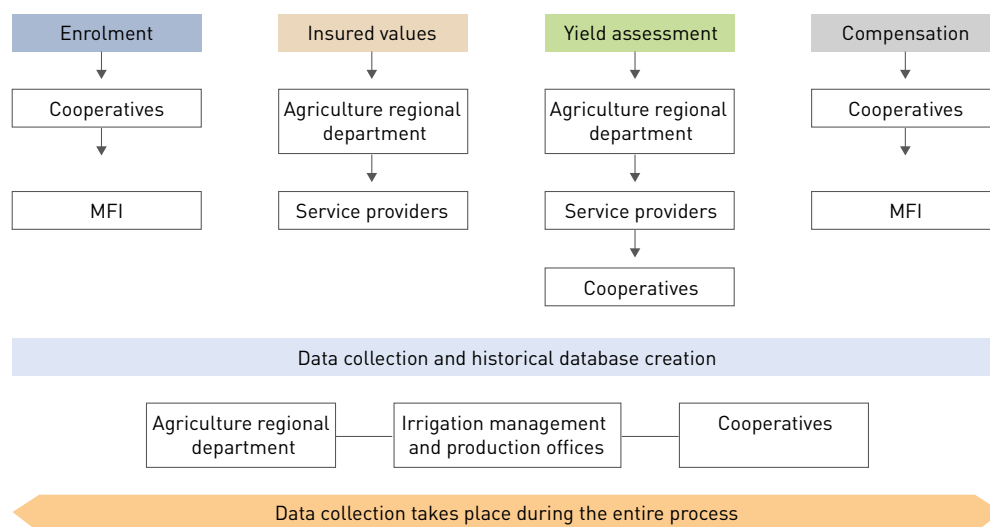
- Enrolment of agricultural producers in the insurance programme;
- Establishment of insured values by declaration of areas under production and validation;
- Determination of actual yields;
- Compensation or indemnities payment, when applicable.

Several local partners were directly involved in this process during the pilot phase: Office du Niger (ON), Agriculture Regional Department (DRA) of Ségou, two agricultural cooperatives, ARPASO and Faso Jigi, as well as ID-Sahel, a private consultant. Their roles and responsibilities are presented in Table 1.

**Table 1: Role and responsibilities of local partners.**

Process	Partners	Main tasks assigned
Risk analysis and pricing	DRA and ON	<ul style="list-style-type: none"> <li>• Provide series of raw sampling historical data</li> <li>• Contribute to insurance areas identification and delineation</li> </ul>
Enrolment	Cooperatives	<ul style="list-style-type: none"> <li>• Produce a list of eligible rice producers</li> <li>• Proceed to collective enrolment</li> </ul>
Insured values validation	DRA and ID-Sahel	<ul style="list-style-type: none"> <li>• Validation by sampling</li> </ul>
Actual yields assessment	Cooperatives	<ul style="list-style-type: none"> <li>• Provide season's results for insured rice producers</li> </ul>
	DRA and ON	<ul style="list-style-type: none"> <li>• Provide results according to the methodology in place for official agricultural surveys</li> </ul>
Compensation	Cooperatives	<ul style="list-style-type: none"> <li>• Proceed to indemnities distribution</li> </ul>

<sup>3</sup> The ten regions of Mali are subdivided into 56 "cercles" and 703 communes.

**Figure 1:** Involvement of local stakeholders throughout the management processes

Public entities, such as l'Office du Niger (ON), and the Agriculture Regional Departments (DRA), already perform agricultural surveys requiring few adaptations to fulfill the needs of an area-yield index insurance. The insurance can therefore rely mainly on this work to measure the actual yields. Cross validations are required and they were done during the pilot phase by ordering additional samplings and by using weather data and field observations from the insurance agents deployed in the field during critical steps of the cropping season. With the contribution of local partners, the cost of determining insured values and yield assessment was significantly reduced.

Aggregators are the other main partners of this index insurance programme. During the pilot phase, rice producers' cooperatives were asked to contribute in allowing access to insurance to their members. Cooperatives were involved in the project and programme by providing valuable information for the identification of homogeneous insurance areas. They were also the main actors of the collective enrolment process, producing a list of members with their respective insured values. Cooperatives also contributed to yield assessments by providing statistics on production and marketing data. Later in the process, aggregators were involved in paying out compensation to farmers. This final step of the process was not tested during FADQDI's pilot in Mali as the index was not triggered and no financial transaction took place. This pilot was rather a development and training activity leading to real implementation in 2017.

Figure 1 illustrates the implication of local stakeholders throughout the management of the area-yield index insurance. While microfinance institutions (MFIs) were not involved in this pilot, they are identified as potential aggregators for the future.

The pilot phase took place in the Ségou region, covering four insured areas; three in the irrigation territory of San and one in Niono, in the perimeters managed by l'Office du Niger. The insurance scheme tested covers climatic and natural risks that cannot be controlled by infrastructures or agricultural practices. Insured risks include excessive rainfall, flood, drought, wild animals, insects and plant diseases, which are exacerbated by the consequences of climate change. The insured value is based on the cost of production of rice, from seeding to harvest. This value was determined after conducting validation workshops with local experts and farmers' representatives. When a farmer subscribes to the insurance protection, he has to declare all his areas under production. He is then protected against losses that could occur after seeding and before harvesting. To be eligible for the insurance, a rice producer has to be able to demonstrate that he follows the cropping methods recommended by competent authorities.

**Figure 2:** Grain threshing after harvest in the Ségou region



## Conclusion

This pilot phase allowed the opportunity to explain the concepts of crop insurance to stakeholders and producers of the rice value chain, especially those who were directly involved in this pilot. More than 400 individuals were met and informed through various meetings and workshops.

Participation of local stakeholders in the pilot phase represented an advantage for the implementation of the programme. These partners demonstrated their ability to perform the tasks identified during the insurance process. Moreover, achieving this pilot phase allowed to pinpoint the improvements required in the definition of these tasks and to further refine the quality standards regarding data collection.

This experience confirmed that this approach can be implemented and the resulting insurance product can be delivered to rice producers by a private insurer starting in 2017. The proposed approach will allow for delivering of the insurance efficiently and at a lower cost to the benefit of the smallholder farmers. There are more than 18,500 farmers producing rice

on 22,000 ha in the areas covered by the pilot. The implication of additional agricultural cooperatives and MFIs will allow a larger proportion of potential clients to be reached for the next cropping season. This next commercial phase will demonstrate the willingness of rice producers to purchase such insurance.

Expansion of the coverage is a mandatory step to address the challenge of demonstrating that area-yield crop insurance can be viable in the long run. Therefore, collection of historical datasets from official agricultural surveys is already underway in order to expand the protection to other rice production areas and also to develop coverage for other crops in Mali. The work by the FARM project is crucial for Malian agriculture as it is paving the way for more comprehensive risk management solutions for smallholder farmers. ■

# Rethinking agricultural insurance: Lessons learnt from the Agriculture and Climate Risk Enterprise (ACRE) Africa

By Pierre Casal Ribeiro



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**I**nitiated as a project of the Syngenta Foundation under the name Kilimo Salama, ACRE Africa is now a registered company, and the Grameen Crédit Agricole Foundation is proud to be one of its shareholders. At the end of 2016, cumulatively more than a million farmers in East Africa were insured by products designed by ACRE. Farmers can insure their dairy cows or their crops, including maize, sorghum, coffee, sunflower, tea, cashew nut or potato. These products are underwritten by UAP Insurance Kenya, CIC Insurance Group Limited, APA Insurance, UAP Insurance Tanzania and SORAS Insurance Rwanda.

## Innovating in distribution: Bundling farm inputs and insurance

In order to reach a large number of farmers, ACRE Africa products are distributed mostly through aggregators, such as lending institutions, cooperatives and out-growers, or directly to medium-scale farmers. ACRE's most popular product is packaged with maize seeds. The replanting guarantee is an insurance directly included in the price of a bag of seeds. When opening the bag, farmers will find a card with a code to send by SMS to activate a 21-day cover. The insurance is free for the client, as the premium is paid by the input company. When the client sends the SMS, ACRE receives the farmer's location and monitors the weather in the area, thanks to satellite imagery and automated weather stations. If there is insufficient rainfall following the 21 days after planting, germination fails. Insured farmers are then automatically reimbursed the value of the seeds on their mobile wallets, without filing any claim. This whole system is based on partnerships with a farm input company and a mobile operator.

Despite the insurance being free, many farmers did not activate their insurance. At first this seems confusing: Why would they not take advantage of a free and valuable service? Client feedback indicates that many farmers do not read or understand the card with the activation code and instructions. To address this issue, the insurance card was redesigned to make it clearer. Furthermore, field promoters are hired each season to raise farmers' awareness about insurance and explain the product. These promoters are farmers themselves and well-known in their communities. Furthermore, if an error happens during the enrolment process, clients are called back to help them register.

This example shows that price is not the only, and perhaps not even the most important barrier to access to insurance. Microinsurance practitioners may do their best to bring down the prices of their products, but clients must first and foremost be convinced of the service's value. The replanting guarantee is a powerful tool to give clients a first experience of insurance. It is a kind of free sample which should lead them to insure more. For this purpose, ACRE will this year pilot a top-up cover: Clients will be given the possibility to extend the coverage for the entire season, and not only for the germination phase. Enrolment is also offered through the mobile phone, but this time farmers need to pay the premium for the additional cover.

## Questioning index insurance

Index-based insurance helps farmers protect the value of their crops. When farmers subscribe through a financial institution, the sum insured is the loan. Credit-linked insurance helps farmers get access to credit, as insurance serves the purpose of first collateral. It also helps maintain agricultural borrowers' creditworthiness in the long term. Should an adverse event occur, the payout will be used to reimburse the loan and



the farmer will be in capacity to borrow again in the future. Cooperatives and out-growers also benefit from insurance. Insurance stabilises the incomes of agricultural producers and reinforces the strength of the value chain.

In the last fifteen years, index-based insurance has become the preferred approach to insure smallholder farmers. Unlike traditional insurance, which requires the services of a local expert to assess economic loss with respect to a claim, index-based insurance draws on biometric data (supplied by satellite imagery or by surface weather stations) or on average yield data to model losses. By reducing administration, distribution and transaction costs, this innovative approach makes agricultural insurance affordable for smallholder farmers. This is also the approach that was initially adopted by ACRE-Kilimo Salama. However, when a disease massively affected maize production in Kenya in 2013, the index-based insurance products did not adequately respond to the crisis, as they only protected farmers against weather-related losses.

This is why ACRE decided to introduce a multi-peril hybrid product, combining the advantages of both index and indemnity-based insurance. Large

scale losses related to weather are monitored through indexes, but for more local events, such as a pest, a disease, fire or hail, an assessment is conducted in the field. Operational costs are kept low as the main risk, drought, remains monitored remotely. Still, farmers get more value from the insurance as they are covered for a broader range of risks. With more risks covered and more confidence in the future, farmers are more likely to reap the benefits of insurance such as better access to credit, more investment and increased productivity. In agricultural insurance, the right approach is usually very context-specific. The example of the hybrid multi-peril crop insurance illustrates that conventional wisdom (i.e. that index-based insurance is the only way to work with small-scale farmers) can be challenged.

The two products showcased, the replanting guarantee and the hybrid cover, are just two examples of innovations brought to the agricultural microinsurance market. The story of ACRE shows that a sustained focus on clients' needs and a deep understanding of their environment is essential to improve microinsurance products. In the end, it is the most relevant insurance products that are going to find their market. ■

A debate on:

# The impact of climate change on microinsurance for smallholder farmers

A debate between Daniel Clarke, Ulrich Hess, and Panos Varangis<sup>1</sup>, moderated and written by **Jenny Glaesener-Nasr**, Senior Development Coordinator, Microinsurance Network. The findings, interpretations, and conclusions expressed in this debate are entirely those of the authors. They do not necessarily represent the policy positions of the institutions or government departments they are employed by.

*Climate change has both direct and indirect effects on agricultural productivity and the livelihoods of smallholder farmers. With changing rainfall patterns, drought, flooding and the geographical redistribution of pests and diseases, it threatens global food security and sustainable development in the short and long term. Agricultural insurance is considered as a valid tool to address the impact of climate change, but is also affected by climate change itself. The debate that you will read below gathers three of the most prominent experts in the field of agricultural insurance and sheds light on many of the questions that are posed in this respect.*



**Daniel Clarke**  
PhD., Actuary in the Government Actuary's Department, United Kingdom



**Ulrich Hess**  
Senior Advisor, InsuResilience Initiative and Agricultural and Extreme Weather Risk Insurance, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany



**Panos Varangis<sup>1</sup>**  
Global Lead for Agricultural Finance and Agricultural Insurance, Finance and Markets Global Practice, the World Bank Group, U.S.A.

## *In what ways does climate change impact the viability of agricultural insurance for smallholder farmers?*

**Daniel Clarke:** Climate change impacts agricultural insurance in many ways, thereby affecting smallholder farmers and their livelihoods. The main challenges remain in adapting their business models to stay productive and have the capacity to invest sensibly in their farms such as planting the right crops and using the right processes.

**Ulrich Hess:** Climate change affects both the production risks and the business models of smallholder farms, as well as the business of agricultural insurance itself. I will focus on the agricultural insurance bit: insurers have to adapt their pricing and actuarial models to this new factor of climate change in the risk equation. I increasingly notice that it affects the uncertainty loading in the risk pricing models, which results in higher premiums and, in some cases, rationing of agricultural insurance. For example, insurers will not venture into areas where climate change models would predict major

impacts. Having said that, climate change impacts are not limited to more frequent disasters only, such as frequent floods or droughts, but they also affect the distribution of rains, false starts of the rainy season and more frequent dry spells.

**DC:** Let me challenge you on that. I don't actually know of any agricultural insurance programmes in developing countries where the climate change issue has been a binding constraint. Very often, the lack of data and bigger trends in productivity prove to be real challenges and create really large pricing uncertainties. Personally, I haven't started to see significant trends in rainfall index data for insurance programmes in developing countries yet. Is this what you are starting to see in the programmes that GIZ is implementing?

**UH:** At this point, climate change impacts are more of a prediction, but in some cases, these are already happening. One case would be the dry spells that took place in Morocco for three consecutive years, basically due to climate change predictions on drought occurrences, and which lead to high premium rates and termination of the weather index-based

<sup>1</sup> Due to a last-minute constraint impeding Mr. Varangis' participation in the debate, his views have been integrated separately ex-post.



insurance programme. Insurers retreat from certain markets because of these uncertainty loadings due to climate change. Another aspect to mention would be transition risks, where farmers have to transition to low carbon and more resilient technologies that increase the complexity of the business of agricultural insurance, which means moving to new varieties and new business models that need to be priced now. Historical data will not be as relevant as it was before, as farmers are switching to new business models.

**Panos Varangis:** Insurance should be viewed within an overall strategy to deal with climatic risks that impact agriculture. Farmers and agribusinesses need first of all to try reducing their exposure to climate risks and become more climate-resilient. This implies investments in and application of new technologies, such as adoption of irrigation, improved storage, low tillage, precision agriculture, etc. This means improving access to new technologies and access to finance for new investments. However, we are well aware that even with such investments and new technologies that reduce risks, we will still have a residual risk which suitably-designed insurance products could try to address. Insurance can thus reduce uncertainty and enable such investments, thereby contributing to a virtuous cycle. Climate change can impact insurance by increasing the uncertainty of the frequency and severity of catastrophic events.

### *So if agricultural insurance is that complex, why are insurance companies still in the business of offering agricultural insurance?*

**UH:** When talking about climate change, we talk about marginal changes. Climate change is not such a game changer, for agricultural insurance, it is just making it more complex.

**DC:** As countries get richer with a growing middle class, as life continues to be risky, and even becomes more risky in some areas, governments can sometimes intervene with compensation schemes after big shocks happen, which can lead to poor incentives and poor risk management in general. As a consequence, the insurance industry is trying to have a discussion with governments about alternatives to ad hoc compensation schemes. They are proposing public-private partnerships between governments and insurance companies, to complement these disaster compensation schemes. This supports the concept of using insurance as a tool to support governments in implementing public policies to support resilience of populations against big shocks, thus providing good incentives.

**UH:** I'd like to present a different view on this. I take Dan's basic argument, that insurance is probably a better way to deal with disaster risks, in most cases, compared to government compensation schemes or disaster aid schemes, but I think that the climate change phenomenon will probably make this argument difficult in the sense that there is now an additional risk or an additional factor that exacerbates disaster risks. Businesses and people will not accept to pay

for insurance as they might say that climate change is a factor that is to be paid by governments themselves. So incentives should be stacked against this worthy cause of switching to insurance especially for the catastrophic risks.

**DC:** There are a lot of things stacked against insurance companies wanting to sell agricultural insurance in low-income countries. This is one of them. We see it tends to be a bit easier when governments work with insurance companies to implement solutions. The insurance industry cannot solve big national global policy issues by themselves, but they could potentially play an important role.

**PV:** We see greater traction in agricultural insurance in those countries where there is a holistic approach. This means that countries need to take a programmatic approach and involve a public-private partnership. There needs to be a suitable legal and regulatory framework, agro-climatic information systems, infrastructure to measure weather events, capacity building programmes for local insurance companies and government agencies, awareness raising to clients, and potentially financial support by the government as needed, justifiable and budget-permitting (e.g. dedicated reinsurance, premium subsidies, etc.). Insurance programmes could also allow a differentiation between commercial agricultural insurance and programmes for conditional cash transfer (using insurance principles for triggering payments) for poor/subsistence farmers. These latter programmes could be administered by private companies but paid by public funds in lieu of ad hoc and ex-post existing disaster relief payments.

### *What is the impact of climate change on production risks, livelihoods and resilience for smallholder farmers?*

**DC:** It varies from country to country. For example, a 10% decrease in crop yields in one African country may lead to a 2-5% drop in consumption for those households, meaning households slightly above the poverty line might be pushed to under the poverty line. On the other hand, it has been seen that if farmers feel they are protected from risks, they tend to invest more in their farms and their productivity increases substantially. In the livestock sector, the consequences of climate change are worse because, unlike agriculture, where crops may be planted twice or three times a year, livestock assets are expected to last longer and are usually used as a source of wealth. In cases where harsh winters (in the case of Mongolia) or strong droughts (in the case of Kenya) occur, livestock can be wiped out, leading to negative long-term impacts on poor households.

**UH:** Based on the findings of an insurance project by GIZ in Ghana, it has been found that insurance has that beneficial aspect, to encourage or incentivise farmers for more productive allocation of their resources. In India and Zambia, smallholder farmers face a number of market risks and their response is to increase food crops or livestock assets, staggering planting dates, which result in suboptimal allocation of resources, thus foregoing revenues just for the sake of security in the case of an extreme event taking place.



The Government of Kenya and insurers taking part in a crop cutting experiment, as part of their area yield index insurance programme.

**PV:** Climate change increases the probability and severity of catastrophic events that impact production and livelihoods. With higher uncertainty, it is likely that farmers will not be willing to commit to investments because they will be concerned by what will happen to these investments if a disaster occurs. This concern is even more pronounced when the farmers need to get a loan, as the occurrence of major production loss will impact on their capacity to repay their loan and thus increase the likelihood of defaulting. Similarly, banks will also not be willing to finance agriculture if they perceive that climatic risks could prevent clients from repaying their loans.

### *In your experience, are smallholder farmers today ready to buy agricultural insurance?*

**DC:** Nobody thinks about buying insurance when they wake up in the morning. There is a lack of familiarity for a lot of people in rural places in developing countries. Insurance tends to grow when it is linked with credit or as part of a distribution channel such as agricultural inputs like seeds and fertilisers. Some standalone insurance products that are not bundled have been successful, though these are few in number.

**UH:** In India, for example, farmers would buy insurance on a standalone basis to have some kind of a disaster safety net. What farmers really want is a business value proposition, including access to credit and to inputs (seeds, fertilisers). Farmers sometimes also engage in contract farming, which involves agricultural production being carried out on the basis of an agreement between the buyer and farm producers. In many cases, it involves the buyer specifying the quality required and the price of the outputs, with the farmer agreeing to deliver at a future date. Contract farming is also seen as a

major opportunity to finance the premiums, which is one of the huge constraints given that farmers don't have liquidity in the beginning of the season when they should be paying the premium. The main issues related to agricultural insurance uptake are: Lack of insurance awareness, lack of adequate distribution channels and limited farmers' liquidity. In an agricultural scheme in Zambia, cotton farmers were asked to pay the premiums at the end of the season, which led to a take up of insurance by 75% of all farmers who were offered the weather and life insurance package. To sum this up: Straightforward business solutions can help increase insurance penetration.

**PV:** As the saying goes, insurance is not bought but sold. The penetration of insurance in every aspect of economic activity is low in most low-income countries and this is exactly due to the factors that Daniel mentioned above: Lack of familiarity, existence of other mechanisms to deal with risks (that may have opportunity costs rather than cash costs), lack of suitable products, etc. These issues become even more important when it comes to the rural sector and agriculture. Where insurance makes sense is if it is in a package of finance and other services that bring to farmers improved access to finance, access to markets, capacity building, new technologies, etc. and in this package insurance can come to complement and enhance these other products and services.

### *How does agricultural insurance modelling today anticipate climate change consequences?*

**DC:** I would like to elaborate on two points: First, pricing, and second, the business development perspective.

What I have seen is insurers and reinsurers looking at historical data in a sensible way. Because insurance contracts are generally over the next season or over the next twelve months, insurers are trying to estimate in their modelling the risk being faced over a relatively short period by using historical data. In this respect, insurers have a slightly easier job than climate scientists, because they don't have to project into the long-term future. It might also mean that some insurance companies chose not to invest in particular areas or even retreat from areas that might be hit by climate change, thus changing their business development perspective.

**UH:** I agree with you. Insurers manage risks by building portfolios (law of large numbers), diversifying portfolio risks, minimising losses and stabilising returns. They do that by reinsuring significant portions of the largest risks and increasing the portfolio. With climate change increasing the frequency and probability of extreme events, we might see an emphasis on portfolio modelling or more offsetting risks in a portfolio. So, because of climate change impacts, a 1 in 20-year event becomes a 1 in 10-year event, leading to a significant impact on premium rates, uncertainty loadings and the price of pure risk set by insurers.

**DC:** I would also add that reinsurers take this very seriously, because they reinsure the portfolio and require reliable data in that respect. Access to reliable data remains the biggest constraint in my opinion.

**PV:** I would agree with Daniel that a big constraint is the lack of reliable data and information to design and price the right products.

### *How can insurance companies be incentivised to offer agricultural insurance when they currently do not do so?*

**DC:** Agricultural insurance is seen as an opportunity for potential development in the future. It is currently not a big business in many developing countries but is undertaking a number of innovations, to offer cheaper and more reliable products, to help farmers manage their risks and increase their incomes. However, even with that said, we don't see many countries where insurance penetration is more than 20% of farmers, even in countries where insurance programmes are heavily subsidised by governments.

**UH:** There are very few agricultural insurers that are not state-owned. Opportunities are very important and margins are higher in these less saturated markets. Agricultural insurance has stepped up in some cases, such as in India, where penetration rates reach 30% and higher. The main characteristics of these schemes is that they are becoming mainstream products and highly subsidised by governments. According to a Swiss Re publication (2016)<sup>2</sup>, the top three agricultural insurance markets in Latin America and the

Caribbean region are also the largest insurance markets overall. Brazil dominates with 61% of the agricultural premiums written in 2015 followed by Mexico (more than 15%) and Argentina (15%).

**PV:** I would say that building a systematic approach which provides the right enabling environment, data/information systems, awareness raising and client education, some public sector financial support and even creating pools so that not a single company takes on the majority of the risks, could entice some companies to participate.

### *How do insurance companies improve distribution of agricultural insurance to reduce administration costs and premium levels?*

**UH:** Insurers seek to reduce transaction costs by a series of mechanisms such as: 1) digitising delivery channels and 2) working through aggregators, i.e they tie their products to other products offering a value proposition to farmers. First attempts to sell agricultural insurance took place in Zimbabwe via normal cell phone subscription. Settlement of insurance contracts is happening more and more through e-wallets and mobile payments and with information based on satellite data and readily available indices.

**PV:** The use of technology (e.g. mobile phones), linkages to financial institutions and use of value chain arrangements between farmers and off takers and/or input distributors could be some of the ways to reduce distribution costs.

### *Do you think that a lack of regulatory frameworks is an obstacle for agricultural insurance?*

**UH:** I don't think so. Regulation is a factor that slows down adoption and discourages some insurers in emerging markets and developing countries. This is due to the regulators' uncertainty, as some regulators see parametric products as derivatives rather than real insurance products, for example in South Africa where index-based agricultural insurance products are not mentioned in the insurance law altogether.

**DC:** I think that regulators find the consumer protection side in regulating index-based insurance products particularly challenging. In developed countries, we don't have experience of regulating index insurance products offered to low-income mass markets. There are still a lot of lessons to be learnt. Regulators can focus on ways to make sure that their products are safe for the mass markets and also reward insurers on going the extra mile to design and distribute agricultural insurance products.

<sup>2</sup> Swiss Re. (2016, July 15). Agricultural insurance in Latin America: taking root. Retrieved from [http://www.swissre.com/library/Agricultural\\_insurance\\_in\\_Latin\\_America\\_taking\\_root.html](http://www.swissre.com/library/Agricultural_insurance_in_Latin_America_taking_root.html).

**UH:** In terms of developments in regulations, in October 2015 the Insurance Commission in the Philippines released an Agriculture Microinsurance or “MicroAgri” Framework to further boost “the provision of agriculture microinsurance products and services that are simple, affordable and accessible to the vast majority of the population dependent on agriculture”. MicroAgri includes both standard indemnity-based and parametric-based microinsurance products. Furthermore, the International Association of Insurance Supervisors (IAIS) is in the process of developing an issues paper, in partnership with the World Bank, on index-based insurance.

**PV:** In many countries, there is a lack of suitable regulatory framework for agricultural insurance and, as Daniel said, this is more of an issue when it comes to index-based agricultural insurance products where there is a lack of regulations. Regulations should focus on how to ensure that insurance products are suitable for the intended clients and should also be accompanied by programmes to educate such clients on insurance so they understand what they purchase.

***Is there any risk that the level of premiums due to increasing hazards and shocks may exclude a larger share of smallholder farmers in the future? What are the solutions envisaged in that respect?***

**DC:** If the insurance premium is high, then this is telling you that the agriculture business is very risky. One way would be to manage or mitigate risks before thinking about insurance. Farmers are not necessarily reducing insurance costs, but changing the way they are managing risks and how they invest in their farms by changing production choices, in a way that is more resilient to climate change. So insurance will help to address their new problem under their new strategy as opposed to addressing their old problem under their old strategy.

**UH:** It simply means that the insurance contract is a different one. For example, the maize farmers need an insurance contract that pays out comparatively more often as opposed to the insurance contract for cassava (a crop which needs less water), which pays out only once in a 20-year period and therefore costs much less.

There is another angle: the climate change delta angle. When climate change is factored in, there is a 10% increase in premium levels doubling pure risk (5%) showing that an external phenomenon has increased the risk level, which will exclude more farmers from farming and also from insurance coverage. My proposed solution to this problem is that climate funds such as the Green Climate Fund subsidise this difference of the 5% in premiums, taking into account that climate change consequences cannot and should not be redressed by the smallholder farmer on his own.

**PV:** If premiums are high due to increasing hazards and shocks, this is a sign that business cannot be as usual and farmers need to try to reduce the risks before looking into insurance. So the primary focus should be on promoting solutions to reduce risks and make agriculture more resilient to climatic effects.

***Are there other strategic solutions at the micro, meso and macro levels to avoid excluding an increasing number of highly climate change-vulnerable populations?***

**DC:** If the objective is to help people to be more resilient to shocks and be financially protected, then part of that is about trying to reduce the actual risks and part of that is about having systems in place that can respond to the risk that remains. Some populations living on incomes below a dollar a day cannot pay for agricultural insurance. So it is more of a social protection question, not necessarily an insurance market development question. There are many possible solutions. It is possible to make basic services and social protection systems respond to climate change. Ideally, these would sit hand-in-hand with insurance systems, as more commercial insurance would be designed for people who can afford to pay the premiums. There is a whole spectrum of solutions depending on where you stand.

**UH:** I agree with Dan, but there is a trap here in my opinion: Though social protection and insurance systems can and should go hand-in-hand, what we really want to achieve is that households become incentivised and become more resilient and, at the same time, manage and reduce actively their risks. That can be done with insurance, inducing more awareness, which does not essentially happen through social protection schemes. These disaster response schemes promoted by governments are very poor substitutes of insurance. They can in fact crowd out insurance. I am talking about payments to people that happen in a post-disaster situation. These payments either come late, sometimes in the wrong forms (food aid instead of cash) and not to the right people. They do not have the ex-ante benefits that insurance has. Insurance does not only have the ex-post benefits that can include risk transfer, but also ex-ante benefits, meaning that people actively manage and reduce their risks and have a more sustainable and more profitable business model.

**DC:** Yes but the biggest challenge here is not the security protection systems, but public policy more generally. Public policy is in general unpredictable and not known until after disasters occur. Therefore, thinking beforehand, what needs to be done with other stakeholders and then doing the proper financial planning, tends to lead to much better development outcomes than waiting until after something happens. I totally agree that insurance systems, annual insurance and insurance thinking are important options to consider to improve development outcomes. It is also possible to imbue social protection systems and basic services systems with insurance principles in order to promote good incentives for clients.



**UH:** Don't you think that it is necessary for people to pay something for the insurance contract, to have these ex-ante benefits we are talking about? In other words, isn't it kind of impossible to have a 100% subsidised insurance product, which makes it look more like a government protection scheme?

**DC:** It all depends on implementation. For example, I don't pay for the National Health Service in the UK, which is paid by general taxation. It is fully publicly funded yet gives me incentives to look after my own health. Bringing in insurance principles can lead to better systems. But what do you do if people do not pay the risk-based premiums, from a policy perspective?

**UH:** People could pay a pure risk premium, otherwise you might end up distorting incentives, holding too much livestock or growing the wrong crops in the wrong areas.

**DC:** My key message is that different countries make different decisions in relation to insurance thinking, insurance principles, markets and products which help to improve what would otherwise be ad hoc compensation schemes.

**PV:** One would need to distinguish between commercial agriculture and poor farmers exposed to climatic risks. Replacing existing ad hoc and ex-post government programmes that currently compensate poor farmers after an event occurs with programmes that are based on transparent, insurance-based principles, could lead to better outcomes. Such programmes exist now in places like Peru and Mexico where the focus is to provide cash transfers to poor people in agricultural areas so they can deal with the consequences of disasters. Beneficiaries are pre-identified and payments are triggered by objective criteria and observable variables.

### *How are incentives and awareness raised at the level of policymakers?*

**DC:** Research from Mexico suggests that politicians increase their vote share by 8 percentage points when they provide post-disaster relief. On the other hand, they do not seem to be rewarded for investing in resilience or risk reduction, which is politically challenging.

**UH:** There is a huge challenge here, as a lot of issues are stacked against paying premiums. There are also disadvantages of disaster relief payouts as money sometimes goes to the wrong pockets. I would say that policymakers lack real incentives to develop agricultural insurance as there are so many informal benefits to disaster relief compensation. Awareness needs to be raised as to manifest benefits of actively managing risks, including risk transfers, thus helping significantly reduce the financial impact of disasters. As a prominent example, many politicians and reports quote the World Bank as having calculated that disaster risk reduction saves between four to seven dollars for every dollar invested.

### *The term "smart subsidies" has been used by a number of multilateral organisations. What exactly is meant by "smart" subsidies? Do you think that premium subsidies are the solution to scaling up agricultural insurance?*

**UH:** Smart subsidies essentially target the populations to be reached, based on a very explicit and legitimate policy objective. Policymakers get a mandate to achieve public policy

aims, where smart subsidies could be used to support these policy objectives. Smart subsidies can be measured where the level of payments does not go beyond the pure risk premiums that farmers will have to pay because of all the incentives we alluded to before. Smart subsidies should also be time-bound and declining potentially to support the creation and enabling of a market.

**DC:** I agree with your articulation of smart subsidies. However, the big question is who is paying and if governments can contribute to the premiums, given all the constraints they have in their budgets.

**UH:** It is useful to distinguish here between catastrophe insurance and agricultural insurance mainly related to production risks. Production risks are in general more frequent and not related to a national disaster. This takes the form of a crop insect/disease or a local flood for example. It is for these types of risks that premium subsidies are more applicable.

**DC:** For example, in the case of Mongolia, the government pays that part related to catastrophic risks and the herder pays the regular risks affecting his livestock.

**UH:** In Paraguay, GLZ is advising governments to include agricultural insurance and disaster insurance within a whole framework. Agricultural insurance can essentially have an important role in the overall disaster risk management framework, because it takes some of the disaster risks away from the government budget which increases incentives of governments to replace some of the disaster aid exposure with meaningful insurance for agriculture.

**PV:** The term "smart" is often (ab)used to justify subsidies. If subsidies are deemed to be "smart", are they then justifiable? Let us drop the nomenclature and focus on what could justify

any type of subsidy. Subsidies can be justified as long as the actions and investments they promote have a greater societal (or sector-wide) benefit compared to individual benefits. So, if subsidies are used to promote insurance, such insurance has to generate benefits to the society that are greater compared to the individual that purchases the insurance and benefits from such subsidies. So the structuring of insurance programmes, the targeting of beneficiaries and what actions such programmes promote should all be analysed before we determine whether the subsidies are justified. Also, given fiscal constraints, governments would need to determine where they have the biggest bang for their buck in subsidising insurance over something else. Finally, there is the risk that subsidies could lower the cost of pure risk to levels where farmers will not take action to reduce risks and continue doing what they do because someone pays for the extra cost. This may increase the exposure of agriculture to climate risks.

### *What are other ways of public support?*

**DC:** There are a number of ways for public support. 1) Data: As data is the life blood of insurance, it is very difficult to offer sustainable products without reliable data. In thriving markets, public investments in data exists, which are then used by insurance companies to design their products. 2) Regulations: A supporting regulatory and supervisory framework is needed, not only in terms of allowing products, but also from a consumer protection perspective to prevent potential products that might dilute the brand of insurance within a country. 3) Supporting market structures: Sometimes, governments take on the risk as reinsurers. They could also play a role in investing in a state-owned company, in working with private companies to set up insurance pools and insurance mutuals. They can intervene in the market by making insurance compulsory when taking a loan from a



bank for example. All of these support mechanisms help in increasing insurance uptake.

**UH:** I agree with your first point on data. I would like to add: Data quality, historical data, good access to data and affordable data. As for other ways of government support, this could be a fourth point which is actuarial expertise, as there is a huge lack of technical expertise in developing markets such as Sub-Saharan Africa for example, because the main challenge is to develop a product that is sustainable over time. Other challenges include: Developing good agrometeorological models to translate weather models into loss models in order to develop good indices for index-based agricultural insurance.

**PV:** I find the responses above quite complete. Perhaps I would add something about financial/insurance education and consumer protection as some additional areas of public support.

### *What are the data challenges in the different types of index-based agricultural insurance?*

**DC:** There are a range of indices that have advantages and disadvantages. Area yield indices are more general indices based on production, like area average mortality of livestock, which measures what actually happens to production. In this type of index, data can be late, manipulated, and can be quite costly.

There are also challenges using parametric indices, such as weather, temperature and wind speed indices, because as a farmer, you heavily rely on the agrometeorologist who is designing the product, which needs to pay in the bad years. As an agrometeorologist, you have challenges in getting historical data.

In the area yield and area average mortality indices approach, the risk is less on the design of the product, than on the implementation challenge. The good thing about area yield index-based insurance is that as long as you have done the sampling and implementation properly (which is a solvable problem from a technical perspective), you will get a payout based on area average yield. Your basis risk, in a sense, is limited to your sampling error. In this case, it is much easier

to know what you are getting. It is quite difficult to understand how accurate temperature and weather indices can be. However, there is no crystal clear cut between both types of index-based insurance. It is still a grey area. One of the challenges is that despite fifteen years of global innovation in agricultural index insurance in developing countries, we don't really have the monitoring data to be able to say whether and where different kinds of products really do provide reliable protection. I would sleep better at night if we knew that farmers would receive claim payments when they most need the money. In my view, there is still a lot of innovation to take place in designing and monitoring indices for smallholder farmers.

**UH:** I agree with you and I don't say categorically that area yield index-based insurance is the worse solution compared to parametric index insurance. Index-based products are context-specific, as you say, and implementation challenges around area yield index-based insurance are quite high. Crop cutting experiments are used in this case to develop the index and trigger, which lead to higher loading by insurers and higher premiums. One additional aspect is basis risk which decreases with parametric insurance, as compared to area yield index-based insurance.

**DC:** There are still challenges with smallholder farmers' understanding of index-based products, in my experience. The advantage in the area yield-based insurance, is that it is better understood by farmers. If you sell a weather index product for the first time, farmers often do not know what they are buying and is difficult for them to grasp the product. Legitimacy of the trigger is important in all circumstances.

**UH:** I agree with the importance of having an understandable and legitimate trigger. During some interviews to farmers in India, they explained how they were involved in data collection from the weatherman. They understood quite well the index and trigger because in their perspective, weather is a very clear phenomenon. It can even be more legitimate than crop cutting experiments done by government officials in one area to develop area yield indices. In order for any type of index insurance to work, there is a need for a strong consumer protection framework and dispute resolution mechanisms in place when farmers do not get the payouts. Both types of indices are tricky and costly as well. There is no crystal clear cut between them both and a lot of trade-offs are involved in implementing either type.

# Facing climate change in Burundi with an integrated agricultural and health insurance approach

By Marcien Ndagijimana, Marcel van Asseldonk, Aad Kessler, Oswald Habonimana, and Annette Houtekamer-van Dam



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## Setting the scene

**B**urundi is one of the poorest countries in the world, owing in part to its post-war struggle and Burundians leaving their homes in fear of the violence to neighbouring countries, particularly Tanzania and Rwanda. More than 90% of the population subsists on agriculture, with less than a dollar a day to spend. Productivity and participation in income-generating activities are very low, mainly due to the lack of investment capacities and resources. Smallholder farmers in Burundi face multiple problems, such as low food security, limited access to finance and healthcare, insufficient agricultural productivity and a shortage of arable land.

To break the vicious cycle of low agricultural production, risk-adverse decision making, lack of resources, and poor entrepreneurial skills, an integrated approach for sustainable agricultural development was piloted within the “Fanning the Spark” project, in which specific attention was given to multidisciplinary financial inclusion services. This project brought together a unique blend of expertise on agricultural and health insurance, covered by private enterprises, NGOs and research organisations. The objective of the project is to increase food security at village level, based on agricultural risk adaptation and investments in crop production, and triggered by better financial and health conditions of farmer families.

## Weather risks and climate change in Burundi

Burundi went through periods of famine that are still engraved in the memory of many Burundians. Some of these famines were caused by adverse weather events (e.g. drought, excessive rainfall and hail), whereas others resulted from calamities such as the invasion of predator insects (e.g., migrating grasshoppers and locusts). Official recordings of weather-related perils in crop and livestock production are



sparse in Burundi. The most recent and detailed description stems from the National Adaptation Programme of Action<sup>1</sup>. Most prominent weather-related calamities were prolonged rainfall deficits and torrential rains (Figure 1).

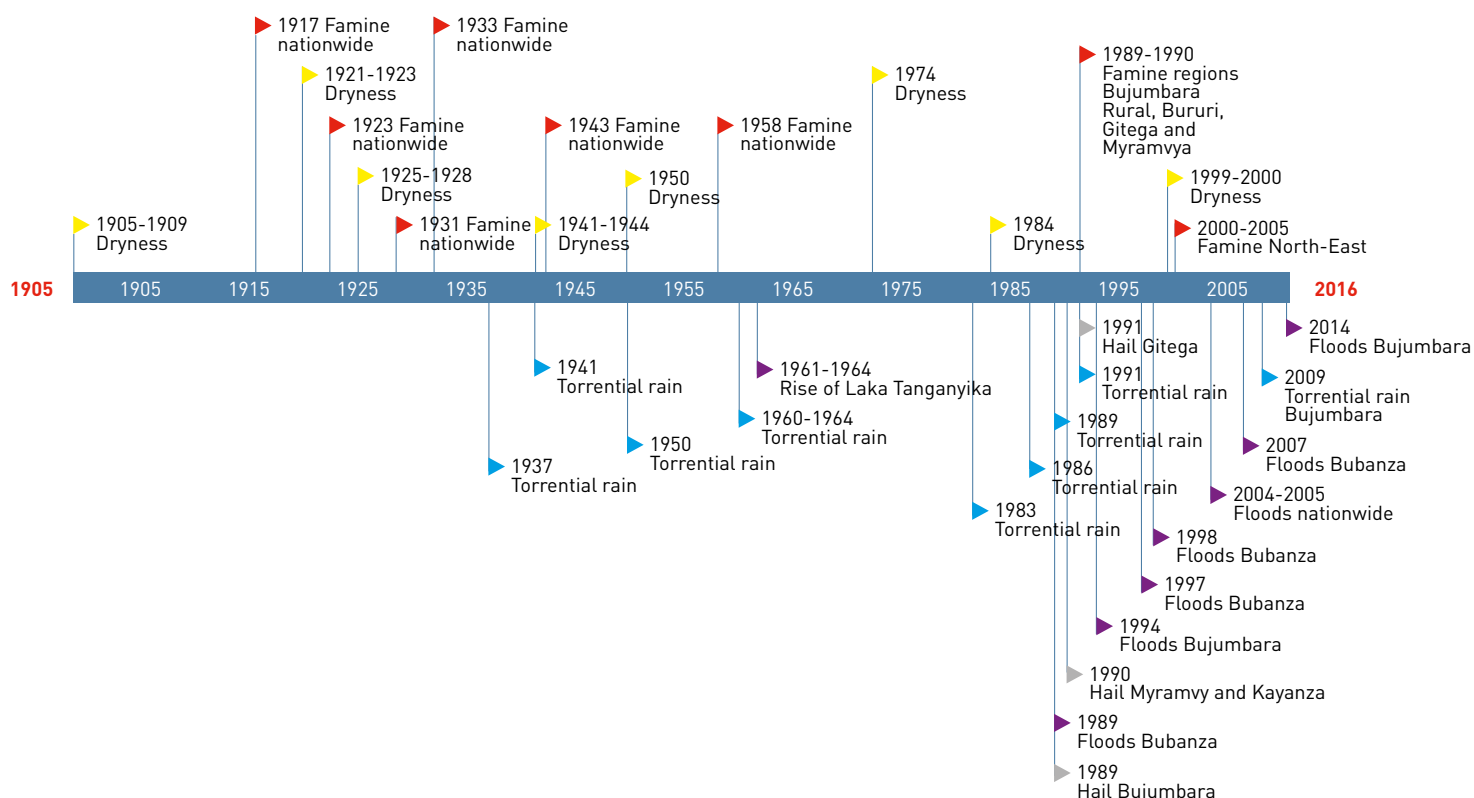
Future climate predictions show that precipitation for Burundi is projected to increase in the eastern and southern parts of the country as well as in the central plateau. While rainfall will increase during the rainy season, the months before the onset of the rainy season (August up to September) may become drier and longer<sup>2</sup>. This may result in postponed planting dates and ultimately may cause harvest losses. There is also a high probability that annual average air temperatures will steadily increase in Burundi over the century. The changes in precipitation patterns and quantity as well as temperature may have significant implications for crop production.

## Towards sustainable agriculture

Facing the reality of climate change, it is crucial that Burundi enhances sustainable agriculture. In the project, this was achieved on a wide scale by means of the Integrated Farm Plan (PIP) approach, an innovative way of transforming small-scale subsistence farm households into more productive and sustainable farms. It is based on a visionary approach, developed and drawn on a map by all family members, as well as a concrete action plan illustrating how to realise that vision. Changing farmers' mind-sets and making them aware that they can transform their reality by conscious collective action is at the core of the PIP approach<sup>3</sup>.

The PIP approach aims at building a common vision objective in farmer families, and generating intrinsic motivation to develop the farm and invest in its natural resources. It

**Figure 1:** Timeline of common climate risks and related impacts in Burundi (Source: NAPA, 2007 and updated onwards)



1 United Framework Commitment on Climate Change. (2007, January). National Adaptation Plan of Action (NAPA). Retrieved from <http://unfccc.int/resource/docs/napa/bdi01e.pdf>.

2 Fritzsche, K., Liersch, S. & Rivas, R. (2014). Climate Change Projections for Burundi. A Summary for Policy Makers. Eschborn: GIZ.

3 Beek, C.L. van, Duivenbooden, N. van, Kessler, A. & Nsabimana, F. (2016). Bringing ISFM to scale through an integrated farm planning approach: a case study from Burundi. In *Nutrient Cycling in Agroecosystems* 105 (3).

follows an integrated approach, with focus on natural resources management, but with a wide diversity of activities that together and in synergy foster sustainable development of the farm (including entrepreneurial activities and social services). Therefore, with the combination of financial inclusion services (savings and credits together with crop and health insurances, the PIP approach can be seen as the generator of a development process in farmer villages, where innovative farmers are in the lead to apply innovative climate-smart agricultural techniques and to facilitate the scaling-up of integration of both local and scientific knowledge.

### MAFICO: A local mutual

As a spin-off of the project, and with some innovative farmers in the lead, a community-based mutual was set up: the Microinsurance and Finance Cooperative (MAFICO). It is an independent mutual owned and governed by local farmers, including its board of directors and executive members, which promote agricultural insurance, health insurance, micro saving and credit schemes. The governance model of MAFICO is based on non-profit objectives, with mutual solidarity, responsibility and democracy, autonomy, voluntary membership and social dynamism movement. Its goal is to promote and deliver integrated sustainable financial inclusion services like savings and short-term credit, together with risk mitigation mechanisms in

farming and health, coupled with entrepreneurial and microfinance services.

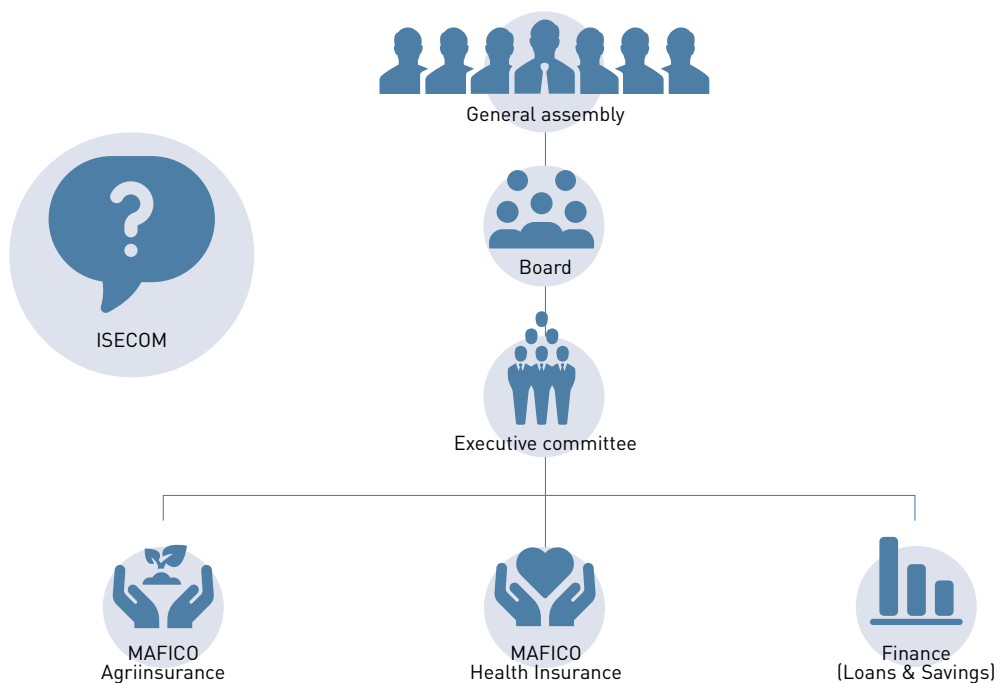
MAFICO is entitled to operate at a national level and pilots its operations in the Gitega province. It is also preparing scaling interventions in Muyinga province. MAFICO is based on Village Saving and Loans Associations (VSLAs), which are saving solidarity groups, of which currently 269 have been established in Gitega under the supervision of MAFICO. Figure 2 illustrates the organisational structure of MAFICO, which currently (following the completion of the Fanning the Spark pilot project) only receives support by a private company (named ISECOM) which delivers technical assistance in terms of management, programme development, awareness raising and monitoring and evaluation.

### The agri-insurance pilot in Burundi

An agricultural insurance pilot scheme is currently in progress in two provinces of Burundi: In Gitega province with 218 farmer members of MAFICO, and in the province of Muyinga with 42 farmers that were involved in the Fanning the Spark Project. The pilot will cover Season B which runs from February to June, with a possible follow-up in Season A (September to December). Burundian smallholders preferred to insure beans and potatoes (Season B), with maize as a potential extra option for Season A.



Figure 2: MAFICO's organisational structure





## Weather index-based insurance

Although recent developments in index-based insurance products offer a tentative potential for coping with yield losses, indemnity-based insurance has a longer history with a broader outreach worldwide. An indemnity-based insurance provides indemnities when crop yield falls below a specified level due to one or more pre-specified natural perils. Yield and weather data are both critical to the design and rating of any crop insurance programme, especially if a history of claim data is absent. In the case of the important commodities in Burundi, high-quality time-series yield data per region and farm, needed to design traditional indemnity-based crop insurance products, is absent, hampering a detailed rating. Advantages and disadvantages of the indemnity-based and the index-based approaches were discussed with Burundian smallholders and their representatives in several organised workshops in 2016 and these farmers revealed a strong preference for an index-based approach. A simple and robust index was therefore designed to cover drought and excessive rainfall, and it is envisaged that the insurance is to be broadened to encompass all

main crops in the coming years. A condition to become amenable to insure is that smallholders followed the PIP approach, and hence apply integrated farm management practices that reduce the risk of being affected by drought or excessive rainfall.

## Ground-based indices

Weather index-based insurance can be either ground-based or satellite-based. The advantage of satellite-based indices is that in general the length of time series is superior to ground-based recordings. Besides, geographical information based on remote sensing has a higher resolution. Local existing weather stations, or otherwise newly installed rain gauges, are used as the source of information for ground-based indices. Ground-based indices are more tangible than satellite-based indices but more expensive. Advantages and disadvantages of both measurement types were discussed with Burundian smallholders and their representatives and they revealed a strong preference for ground-based indices. Six rain gauges were installed in the pilot zone; that is, three per province.

## Payout and risk premium

The two triggers are based on the recurrence interval of drought and excessive rainfall respectively. Recurrence intervals were based on 30-year historical rainfall data analysed by the Information Processing Centre of the Department of Hydrometeorology in IGEBU (Geographical Institute of Burundi). Based on the farmers' preferences elicited at focus group meetings, the original design was refined in terms of recurrence interval per peril and the level of payout. For drought, the probability of payout was set at 20% in Muyinga and 10% in Gitega, whereas it was 23% and 13% for excessive rainfall respectively (Table 1).

The insured amount is 50% of the total investment in inputs (i.e. fertiliser and seed).

**Table 1:** Recurrence interval and corresponding trigger values of deficit and excessive rainfall for Season B in Gitega and Muyinga

Province	Recurrence interval/deficit rainfall	Recurrence interval/excessive rainfall	Drought trigger	Interval qualified as normal	Excessive rainfall trigger
Gitega	0.10	0.13	<480 mm	480-720 mm	>720 mm
Muyinga	0.20	0.23	<431 mm	431-647 mm	>647 mm

Premium is paid 15 days preceding the start of each season. The insurer MAFICO involved in crop insurance, will pay out to the insured within 30 days of expiry of the effective period of the coverage specified. Over time, the risk premium can be further adjusted to align with the preferences of farmers involved. Risk premiums can decrease if less frequent payments (in terms of recurrence interval) and/or lower levels of indemnities (% of amount insured) are preferred, and vice versa.

### Mutual based with limited liability

In the case of extreme systemic climate shocks which affect the majority of the insured at the same time, the insurer will not be able to pay all insured according to the agreed conventional payout. Given a limited liability, the insurer shall pay each farmer a maximum of 85% of the premiums received in case aforementioned shocks are incurred with relevant adjustment according to the severity of the shocks. In a year without (or limited) losses, the insured remain the owner of (part of) their contributions. A part of the amount, determined by the crop insurance members' assembly, may be used to build a reserve or premium discounts for those who continue the insurance cover in the subsequent year. As this insurance is developed under a mutual approach, the insured are responsible for any change regarding the insurance policy.



## Organisation and operation

Prior to the start of the agricultural insurance pilot, farmer awareness-raising activities were rolled out in the project villages in both provinces. Two farmers were appointed at each rainfall station to collect daily rainfall data. This is done in close collaboration with IGEBU, profiting also of their national weather data. In the direct surroundings of these rain gauges, participants for the pilot were sought, especially targeting the nearby VSLAs.

VSLAs were the basis for the financial issues related to the agricultural insurance, providing a line for the insurance in their operation system. In a VSLA, at the end of each year, members evaluate their savings and generated interests on granted loans. The agreement is that 50% of their savings are used for a credit fund (investment), 30% is used for the insurance scheme and the remaining 20% is shared among the members to be used for family needs. Thus, for the insurance scheme, each VSLA contributes an amount which, if insufficient, is complemented by the members.

As this was a pilot scheme, VSLAs participating in the pilot were selected based on some specific criteria which were discussed and agreed upon by the farmers. One of the crucial criteria was that each participant in the agricultural insurance pilot should have a PIP, as such, enhancing sustainable agriculture and reducing risk of crop failure. Other criteria included "having a micro-health insurance card", and "being well-performant financially and socially". In total, 13 VSLAs were selected in Gitega and 21 in Muyinga, with (some of) their members now involved in the pilot. By the end of Season B, the agricultural insurance scheme will be reviewed based on focus group discussions with the farmers to discuss lessons learnt and the way forward. These findings will give insight on scaling up opportunities for the next seasons, both in Gitega and Muyinga.

In addition, MAFICO<sup>4</sup> collaborates with local health facilities in delivering healthcare services delivered at primary health centres such as hospitals and eye care centres. Since August 2016, those health centres cover 5000 insured people from the 818 households with basic healthcare packages including consultation, medicines and eyeglasses.

<sup>4</sup> The community-based MAFICO institution is managed by a multidisciplinary Executive Committee composed of elected community leaders in the domains of agriculture, savings and loans, health, social cohesion and integrated development, risk mitigation and youth-sensitive issues. The MAFICO innovations are scaled up vertically through governmental institutions such as the Ministry of Finance (promoting the National Financial Inclusion Strategy), the Ministry of Agriculture, the Ministry of Social Affairs, the Ministry of Health, the Ministry of Communal Development, and horizontally through upscaling MAFICO pilots to adjacent communities.



## Conclusion

The pilot integrated agricultural insurance approach combined an integrated farm planning approach with community-based financing (i.e. VSLAs) and a mutual-based insurance. It is envisaged that community-based financing enables smallholders to increase access to credits for investments (e.g. for buying improved seeds and fertilisers). This financial service is complemented by providing on a voluntary mutual-based crop and health insurance cover. Since excessive rainfall and droughts together with sickness of family members heavily impact agricultural production, not only directly by yield loss and high healthcare costs but also by demotivating farmers to invest in land, insurance can mitigate this risk thereby enabling income smoothening and improvement.

As this pilot scheme is part of an integrated approach to tackle food security and promote sustainable agriculture in the face of climate change effects in Burundi, a crucial spin-off effect of the agricultural and health insurance is that participating farmers will invest more

in soil and water conservation measures. These protective measures reduce the impact of drought and excessive rainfall on the yield, leading to less vulnerable farmers. For farmers that optimally protect their land, this agricultural insurance is therefore a clear win-win: They lower the risk of being affected by climate change, and if there is drought or excessive rainfall according to the set thresholds for their region, they will receive the indemnification. As such, the insurance scheme becomes a positive incentive to invest in sustainable agriculture, which is a key step towards enhanced food security in Burundi. Furthermore, agricultural promotion needs to go hand-in-hand with financial inclusion services such as loan-credit systems supported by the VSLAs, and linked with income-generating activities. This business framework offers a potential for increasing the ability to pay insurance premiums and supports member retention. ■

# How insurance can assist agriculture value chain players in adapting to climate change

By Miguel Solana and Pranav Prashad



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Climate change is one of the biggest threats to the world's 500 million smallholder farms. With changing rainfall patterns and rising temperatures, most farmers in developing countries are badly impacted as agricultural production greatly depends on annual weather conditions and natural resources. As a result, climate change has a direct impact on agricultural practices and smallholder farmers, reducing productivity (yield loss, poor livestock health, and irregular growing seasons) and income generation, and in turn food security. According to the Consultative Group on International Agricultural Research, West African countries will suffer mean production losses of between 20 and 40% by 2050 (CGIAR, 2015). Furthermore, a recent report projects that annual agricultural exports in Latin America and the Caribbean could be expected to decline by around USD 50 billion by 2050 solely on account of climate impacts on crop yields, with an overall regional reduction of maize, soybean, wheat, and rice yields valued as high as USD 8-11 billion loss in net export revenues by 2020<sup>1</sup>.

One of the biggest challenges for insurance is how to integrate the risk management component to the different existing climate adaptation mechanisms. There is a strong consensus that Climate Smart Agriculture (CSA) is the way forward when it comes to adaptation practices for smallholder farmers. This approach is used to address climate change adaptation and resilience, because it fully integrates productivity and income challenges. CSA aims to tackle three main objectives:

1. Sustainably increasing agricultural productivity and incomes
2. Adapting and building resilience to climate change

3. Reducing and/or eradicating greenhouse gas emissions, where possible<sup>2</sup>

Therefore, one of the main priorities for the insurance industry to develop solutions for climate risks should be to understand CSA and link its products to adaptation and resilience practices. This will also help to make climate insurance products sustainable. Without adaptation, the risk for losses would have no limits, and it would prove challenging for the industry to really manage risks that can materialise on a regular basis.

## Learning about farmers' life cycles

Models for rural and agricultural development need to better understand smallholder farmers and their organisations in the context of the value chains in which they are operating. At the centre of the rural financing and adaptation agenda, there is a need to analyse the vulnerability of smallholder farmers to risks beyond productivity. Currently, solutions for agricultural risk management have mainly focused around productivity, whereas family, political and market prices in face of climate change can be exacerbated by farmers' lack of adaptive capacity, limited income opportunities and inadequate access to formal financial services. This can mean that the adoption of better productivity and adaptation practices will be linked to better risk management at the human, market and financial levels. By analysing the cash flow of farmers linked to the family expenses, it was shown that integrating both family and productivity expenses can allow the industry to design products that are realistically adapted to the complete risk management needs.

<sup>1</sup> Fernandes, E. C. M., Soliman, A., Confalonieri, R., Donatelli, M. & Tubiello, F. (2012). Climate Change and Agriculture in Latin America, 2020–2050: Projected Impacts and Response to Adaptation Strategies. Washington, DC: World Bank.

<sup>2</sup> Mutoko, M. C., Rioux, J. & Kirui, J. (2015). "Barriers, incentives and benefits in the adoption of climate smart agriculture. Lessons from the MICCA pilot project in Kenya". Food and Agriculture Organization of the United Nations.

The collaboration among insurance companies, agribusiness companies and extension services organisations can not only help in making available insurance covers, but also aid in educating the farmers on the products and services being offered to them as the communication can be done to the entire group. Research studies also point to the potential efficiencies of selling and transacting through groups. A study by economists at the University of California at Berkeley and the University of Auvergne argues that selling to groups rather than individuals can result in higher uptake as individuals tend to undervalue risks, while groups may not. Researchers at Oxford University found that when groups of Ethiopian farmers belonging to informal financial and social clubs were given information about the benefits of weather insurance, uptake increased from 2% to 36%.<sup>3</sup>

### Understanding and working within the value chain

Farmers do not work in isolation but are impacted by both forward and backward linkages, are integrated to value chains that improve a product, and are linked to processors and markets. Some of the first steps of the industry linking to existing governance structures in the value chain show a stronger understanding of the diversity of activities and roles.

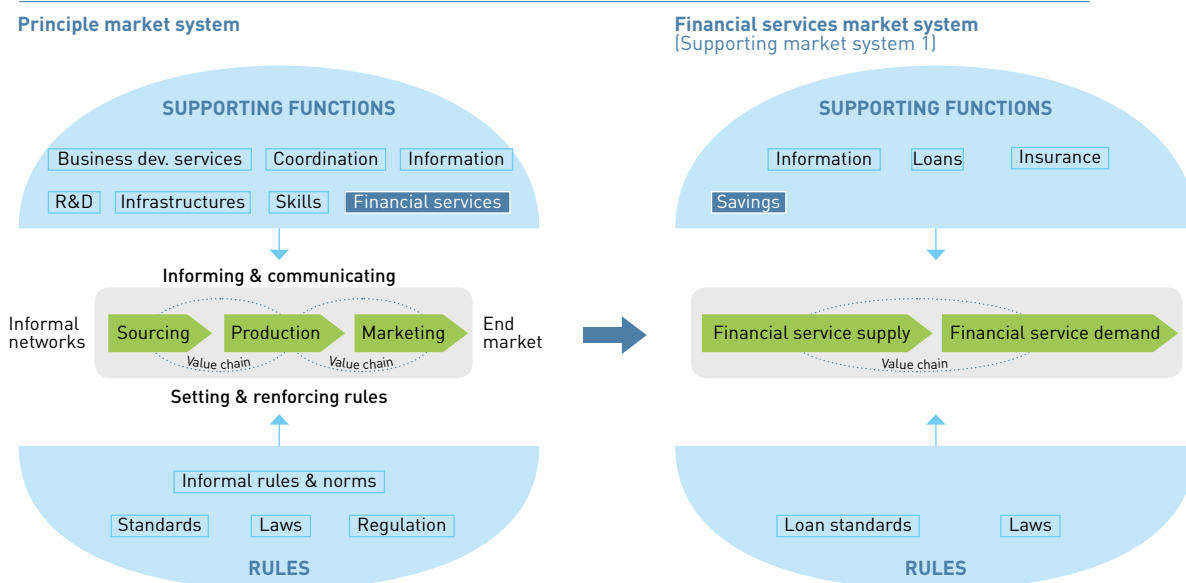
An example of involvement of multiple players in the value chain is the insurance project for cotton farmers supported by PlaNet Guarantee in

Burkina Faso. Cotton farmers are organised as members of Groups of Cotton Producers (GPCs) and are being offered insurance along with the loans taken from EcoBank. Enrolment is done via the National Union of Cotton Producers of Burkina (UNPCB), which officially represents the GPCs. A group policy is signed by UNPCB on behalf of its GPCs and Ecobank is designated as the preferred beneficiary because of the credit provided to the farmers. In addition Sofitex, which is Burkina Faso's state-owned leading cotton company, with long-standing experience in cotton production, provides technical inputs to farmers along with other agricultural advisory services and weather reports. A forecast on potential yield problems is also provided.

This all-round support of the cotton producers union, credit facilities from the bank and advisory support helps in creating a product that aims to stabilise both revenue and investment capacity of cotton farmers – aided by insurance, it makes loans available to farmers in the next period even if they have not been able to repay the loans due to adverse conditions in the current period. More than 14,000 farmers have been enrolled in the programme so far.

The market systems approach, illustrated in Figure 1, helps us understand how value chains work with core functions and how financial services are only a support function that needs to be further understood within the context of the value chain. Understanding the full value chain is relevant for the financial services industry to be able to fit in as a value-generating service.

Figure 1: The market systems approach



<sup>3</sup> Microinsurance A Hard Sell: New research suggests insurance can be made more attractive for poor farmers. The Economist, January 2nd, 2014.



## Partnerships among a diversity of players to create the right incentives

Over the past decade, we have observed increased research around the question of whether insurance creates the right incentives for farmers to invest in more productive practices. In the context of the value chain, it can be observed that there is a diverse range of factors that influence the productive behaviours of its players: Market prices, access to infrastructure, governance of farmers' organisations, regulations, financing availability, seasonality of crops and its dependence on climatic events and internal relations among value chain players, etc. This diversity of elements shows the importance of the value chain in the delivery of solutions (including insurance) and how the dynamics will be extremely different from value chain to value chain and, furthermore, from country to country.

Using various players along the value chain can help increase insurance uptake as well as create value for farmers. The farm input suppliers, farmer associations, crop institutes and farm off-takers or buyers of the farm's outputs, can all support the growth of insurance as a way to address the consequences of climate change. The Agriculture and Climate Risk Enterprise (ACRE Africa) has developed a replantation guarantee product for maize farmers which was introduced to them through agro-vets and seed distributors. The product helps farmers replant within the same season in case of rain failure within 21 days of seeding, thus providing them with an income for the season. The use of technology helps in registering the farmer under the insurance programme as well as registering claims.

## The way forward

The key for sustainability will revolve around creating strong linkages to adaptation mechanisms that will help make insurance part of a comprehensive solution to smallholder farmers. The financial services industry needs to understand how specific value chains are working and to foster partnerships that support the delivery of integrated services to adapt to climate change effects. ■

Each player within a value chain faces their own risks and financing challenges. Insurance is not the leading solution in the set of needs of a value chain and it will usually have to be integrated into a broader set of solutions that sometimes revolve around financing but not always specifically. Thinking about how different insurance products can be designed for the different players and then integrated into the context of how value chains are working, is a way where the adoption of insurance can be seen as a value that helps the value chains to work more efficiently. Additionally, when thinking about value chains in the context of climate change and the impact it has on the functioning, we can observe that adaptation will be linked to additional expenses that will require financing that will have to be integrated to the functioning of the value chain.

A project in Mozambique implemented by the reinsurance broker Guy Carpenter used various players along the value chain to cover cotton farmers through a public-private partnership. Two insurers, Hollard and EMOSE, covered 43,000 cotton farmers contracted with the agribusiness firms Olam and SANAM with weather-based index insurance solutions using satellite data. The premiums for the insurance company were pre-financed by the Cotton Institute of Mozambique (IAM) and the agribusiness firms, and recouped from the farmers at the end of the season. The effectiveness of the programme was tested in 2013, when drought triggered claims totalling over USD 230,000 in payouts<sup>4</sup>. Based on this experience, IAM is working on plans to expand coverage to all 200,000 cotton farmers in Mozambique. The insurance industry will have to identify the best ways to integrate its solutions to the financing mechanisms that will emerge at the value chain level.

<sup>4</sup> Emerging Insight # 103. March 2015. Using meso-level distribution to achieve scale and control cost. ILO's Impact Insurance Facility.



# Overcoming the challenges in designing natural hazard microinsurance products: A MiCRO experience in Central America

By Josh Ling and Andrea Camargo



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**T**he Microinsurance Catastrophe Risk Organisation (MiCRO) is a reinsurance company specialising in the design and implementation of natural hazard risk transfer solutions for low-income segments of the population. This article details how MiCRO and its partners are trying to overcome technical, awareness, and regulatory barriers for microinsurance, through their work in Central America. As an organisation with a social mission, the article also offers some thoughts on how to achieve financial sustainability when offering these insurance products.

## Background

MiCRO was founded in the wake of the 2010 Haiti earthquake by the international NGO, Mercy Corps, and the largest microfinance institution (MFI) in Haiti, Fonkoze. After first launching in Haiti, MiCRO went on to provide microinsurance coverage to over 65,000 Haitians. In November 2016, the organisation launched its first product in Central America, "Esfuerzo Seguro", an index-based bundled earthquake, drought and excess rainfall insurance for small producers in Guatemala that will also launch in the El Salvador market in 2017.

MiCRO was founded as a reinsurance company specialising in the design of risk transfer solutions to the unserved and underserved population in order to fill an important gap towards achieving more equitable access to insurance against natural disasters. As a reinsurer focused on natural hazard risks, MiCRO not only aims to provide reinsurance capital, but also modelling expertise on how index insurance products can be designed, and how the layers of insurance

and reinsurance can be optimally structured and divided. In doing so, it can provide the most cost-effective solutions to clients, whilst also confronting product design challenges such as basis risk. In addition, MiCRO provides technical assistance to local partners to ensure that the products designed are understood and consumers are effectively protected.

## The Central American expansion

Central America is a region that is highly exposed to natural hazards with the effects of climate change making natural disasters an ever more common occurrence. Earthquakes, hurricanes, tropical storms, and droughts continually cause damages that are particularly acute for vulnerable low-income populations who lack an adequate safety net. The most recent large-scale natural disaster in the region was Tropical Storm Agatha, causing close to USD 1 billion in damages to Guatemala and El Salvador.

Unfortunately, despite such high exposure, access to insurance against natural disasters is extremely low across all of Central America. Insurance penetration in general across Guatemala, Honduras, Nicaragua and El Salvador, the initial four Central American countries selected by MiCRO, is less than 2%<sup>1</sup>.

In such a context, MiCRO, with the support of international and local partners such as the Swiss Development Agency, the Multilateral Fund (FOMIN) managed by the Inter-American Development Bank (IADB), Swiss Re, the KfW

<sup>1</sup> Swiss Re Sigma Report, 2015.

Development Bank of Germany, and Mercy Corps, started its expansion in Central America with the objective of designing and implementing holistic risk transfer solutions with real value, that are affordable and financially sustainable. Since 2013, MiCRO has been working with local partners such as Aseguradora Rural and Banrural in Guatemala, and Seguros Futuro and Banco de Fomento Agropecuario (BFA) in El Salvador, to design and test such solutions.

During this process, MiCRO has encountered different obstacles, some of which are more difficult to overcome than others.

## Overcoming obstacles

### Technical barriers

A challenge not uncommon to a variety of different microinsurance products is a lack of data upon which to price the product. As an index insurance product, payouts under MiCRO's product depend on the observed levels of a pre-defined index that utilises satellite data to measure rainfall and droughts, and ground vibration measurements to determine earthquake magnitude. Index insurance provides transparency and allows the product to minimise the administrative costs associated with loss adjustment. However, the creation of a reliable (and viable) index insurance requires a strong correlation between observed index levels and losses experienced on the ground.

*Esfuerzo Seguro* was designed using around 15 years of historical data. Compounding the challenge of scant climate data with which to design and price the product, climate change suggests that future weather patterns are likely to be significantly different from those observed over the last 15 years. For an actuary, a pricing exercise such as this one presents a far more daunting challenge than mortality improvements observed on a life table over a 50-year period. In fact, the complex modelling of *Esfuerzo Seguro* was performed by a hydroclimatologist, who developed indices based on observed monthly levels of vegetation, and 3-day accumulated rainfall, both of which correlated with historical losses and are used to cover the risks of drought and excess rainfall respectively. MiCRO verified the correlation to actual losses by interviewing numerous potential clients living on small 2 hectare farms in various areas of rural Guatemala. A price was then calculated based on a payout structure that maximised the insurance coverage for the most catastrophic events, whilst still falling into the price range acceptable to vulnerable populations with low disposable income.

As any good actuary knows, any single prediction of the future has a zero probability of occurrence. In the context of climate hazards that are difficult to model, one of the most significant tasks is the creation of a monitoring system that can assess the quality of the index design. If the index insurance is consistently over- or under-paying in a particular region, for a particular hazard, when compared to original assumptions, pricing and product design must be adjusted to ensure the product's long term viability. Although microinsurance has clear social objectives, the price charged is sufficient to cover all claims and administrative expenses incurred by the product. This enables the product to continue to be offered into the market, and to be reinsured to minimise the capital strain on local insurers as the portfolio expands its scale. As an organisation with a social mission, MiCRO ensures that its product-related expenses are kept to a minimum to ensure that the largest percentage of the premium continues to be direct towards paying claims and supporting low-income livelihoods.

### Awareness barriers

One common challenge in microinsurance is a lack of awareness of the low-income segments of the population, not only about insurance, but also more broadly about other mechanisms that could serve to reduce their risks and improve their preparedness to catastrophic natural hazard events. When the insurance product is index-based, this challenge is exacerbated, mainly because payments are based on indices rather than the losses felt on the ground. To mitigate this, MiCRO created a specific Financial Education Program (FEP) and a Value Added Program (VAP) with the following objectives:

Firstly, to build consumer trust and credibility by ensuring that clients are aware of the particularities of index insurance products and therefore, their expectations are aligned with the offered coverage;

Secondly, to provide a set of tangible services that help consumers to be more aware of their risk exposure and the array of tools available to support them to be more resilient. Such an approach will better support the introduction of insurance products in the future, as the adoption of better practices in respect of disaster risk reduction increases the "insurability" of the unserved and underserved markets. In this respect, MiCRO and its partners are conscious that risk transfer solutions are only part of the puzzle; a puzzle that will be incomplete if a broader dialogue on risk management for vulnerable populations is not brought into consideration.

The features of both the FEP and VAP are outlined below:

The FEP was designed to train both the staff of aggregators and end consumers about the features of the product. For both audiences, didactic tools were created using basic and familiar elements, such as rulers and colour coded warning systems, in order to convey complex ideas of index insurance products. Training materials, such as videos, puzzles, and infographics, were created leveraging on those didactic tools (See Figure 1). The FEP is of particular interest to supervisory authorities, given their awareness of the challenge and the need to ensure effective consumer protection.

The VAP aimed to offer end consumers a set of services related to disaster risk reduction that could be perceived by the user as positive additions that make the product more tangible and appealing. In order to do so, MiCRO partners with local institutions to provide linkages to disaster risk reduction programmes for its target clients, as well as bundling its insurance offering with savings and loans products offered by local financial partners. This approach not only provides

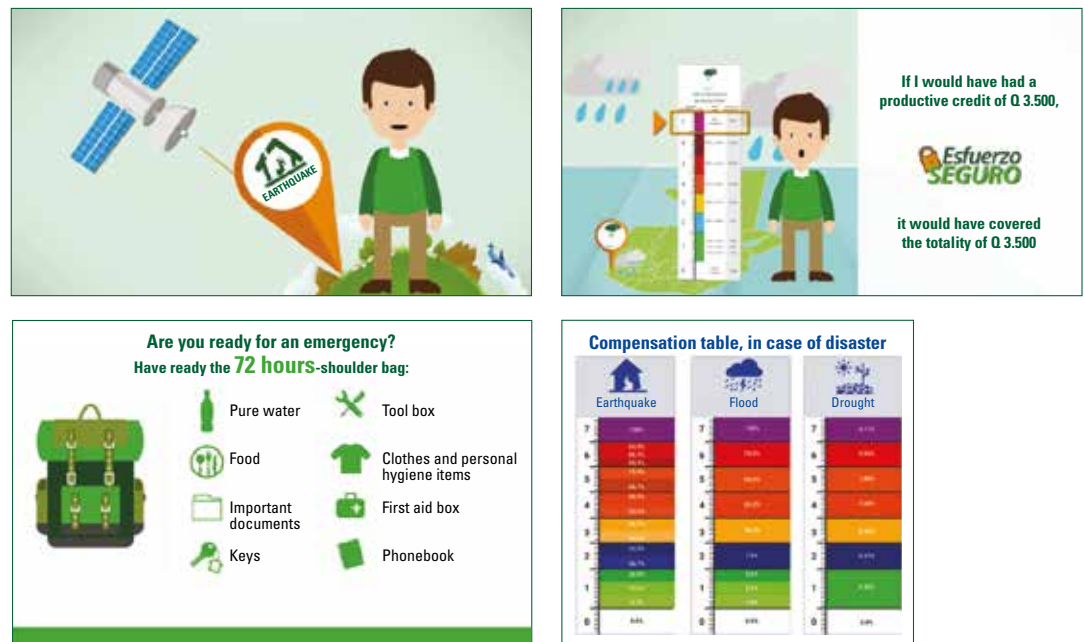
a more holistic risk management solution, but makes the insurance risk transfer solution more effective in transferring the residual risk after other risk mitigation activities are accounted for. In Guatemala and El Salvador, MiCRO is promoting the adoption of family emergency plans and good disaster risk reduction practices through an incentive package that allows clients to win items to put together their 72-hour emergency kit, and by transferring weather forecasts and emergency warnings through SMS to end clients.

The FEP and the VAP currently being piloted are first versions that will be improved over time. A monitoring and evaluation system will assess if both programmes are accomplishing their objectives.

### Regulatory barriers

The roll-out of index insurance products in certain jurisdictions, such as Guatemala and El Salvador, requires that the respective supervisory authorities approve the products before they are offered in the market. The process of achieving product approval for an innovative insurance product, such as index insurance, can be chal-

Figure 1: Examples of FEP (Financial Education Program) tools. (translation will be provided)



<sup>2</sup> Unless a specific dispensation has been provided by the supervisory authority for a particular pilot.

lenging for reasons such as the following: (i) Very few countries have developed regulatory frameworks to enable index insurance products; (ii) this means that index insurance products should be designed following the guidelines of regulatory frameworks that are very traditional, notably with regard to the interpretation and implementation of the indemnity principle and the insurable interest<sup>2</sup>; and (iii) that the complexities of index insurance products increase the concerns of supervisory authorities with respect to consumer protection.

In order to overcome the challenges of the product approval process, a dialogue platform between the supervisory authorities, the local insurers and MiCRO was established from the initial stages of product design. The objective of the platform is to create a direct channel of communication that facilitates the joint design and implementation of these products in both countries. Local insurers and MiCRO, together with the active support of both supervisory authorities, crafted the insurance products to ensure that they are innovative but also adapted to the regulatory frameworks of each jurisdiction. During this process of collaboration, MiCRO supported the process not only by reviewing in detail the regulatory framework of both countries and ensuring that the products designed were aligned with local provisions, but also by enabling an experience-sharing platform with supervisory authorities of other jurisdictions that have approved similar products, or which have issued, or are in the process of issuing, specific regulatory frameworks. In late 2016, MiCRO organised a workshop on the regulation of index insurance products specifically targeted to supervisory and regulatory authorities. In addition, the concerns of the supervisory authorities of Guatemala and El Salvador, in respect of disclosure of information in a transparent and simple way of a complex product, were considered and analysed in depth, and they were central while designing the FEP, marketing materials and contractual documents.

As a result of months of collaboration and dialogue, the supervisory authorities of Guatemala and El Salvador approved two index insurance products. It is important to emphasise that the joint collaboration with the supervisory authorities will still continue even after the products have been approved. This will ensure that the supervisory authorities follow closely the developments of the product and can monitor and evaluate their relative impacts on the end clients.

## The future: How to achieve financial sustainability

The long-run success of MiCRO's programmes in Central America has yet to be proven over time. Nevertheless, MiCRO recognises a number of key factors in its approach that will lead to its financial sustainability and, most importantly, to achieving its social mission.

MiCRO's products are simple to understand, connected with tangible services and designed using a widely applicable insurable interest. These three elements facilitate the "replicability" of the model with other aggregators and in other jurisdictions, whilst ensuring that the product responds to specific and relevant needs. Initially working through microfinance institutions, Central America presents numerous opportunities to partner with other aggregator partners such as microfinance institutions, producer cooperatives, and financial cooperatives, amongst others, to reach the vulnerable low-income populations that have uninsured exposure to natural hazards. Such elements are key to ensuring scale and financial sustainability.

By providing direct technical assistance and product development knowledge to a wide range of local partners, MiCRO is installing capacity in each jurisdiction; a key element that, over time, will enable the introduction of other index insurance products in the market that will allow consumers to choose the products that best fit their needs and particularities. MiCRO, as a reinsurer, will have the ability to develop, implement and hold the risk of the products it designs. In-house modelling and pricing provides the organisation with a deep understanding of the risks it is covering, something that is crucial for a reinsurance company.

For MiCRO, it is key to disseminate knowledge to supervisory authorities and regulators about index insurance products, as it is not just about approving one product, but it is about promoting a wide offer of responsible index insurance products in their jurisdictions.

MiCRO stands with the belief that the most impactful way to improve the lives of vulnerable low-income populations in Central America is to design socially impactful solutions that can be financially sustainable in the long-term. As its first products launch, MiCRO continues to take steps in this direction, unlocking solutions to expand natural hazard microinsurance across the world. ■

<sup>2</sup> Unless a specific dispensation has been provided by the supervisory authority for a particular pilot.

# Risk reduction and adaptation to climate change for low-income farmers in India

By Micro Insurance Academy's "Climate Resilience through Risk Transfer" (RES-RISK)



## The Project

Climate change adds risks to agricultural activities; the risks are more pronounced especially at the base of the pyramid (BoP) of developing countries, where risk coping mechanisms are not very strong, and where farmers depend on climate-sensitive agriculture for their livelihoods. Therefore, the RES-RISK project has given pride of place to developing innovative risk transfer mechanisms that combine a better understanding of the risks with tailored insurance solutions.

Agriculture insurance coverage remains low in all developing countries. As India has the largest number of farmers insured under crop insurance compared to any other developing country, there is broad interest in the Indian context. The Government of India has promoted several crop insurance initiatives, and has been subsidising the premiums. These measures notwithstanding, about 75% of Indian farmer households are not covered by crop insurance. Most of the farmers that are insured do so by obligation when they take a loan for agricultural inputs. Mandating leads to the perception among farmers that

insurance is an asset cost for them and an added benefit for lenders, whose risk of farmer default is reduced by the insurance. Mandating also leads providers to lose sight of farmers' needs, and customise insurance to meet those needs. Moreover, the low correlation between losses and payouts (high "basis risk"), typical to weather index-based crop insurance in India and other developing countries, suggests a better index-based insurance is yet to be adopted.

The Micro Insurance Academy (MIA) (in partnership with BASIX – a livelihood promotion institution established in India) leads the "Climate Resilience through Risk Transfer" (RES-RISK project)<sup>1</sup>. RES-RISK aims to enhance the resilience of communities vulnerable to climate risks through pro-poor microinsurance solutions. The project has been implemented in India in (1) flood and waterlogging-prone areas in North Bihar - Vaishali district (Hajipur, Bidupur, and Vaishali blocks) & Muzaffarpur district (Meenapur block) and (2) drought-prone areas in Maharashtra - Beed district (Kaij, Beed, Ambajogai, Dharur blocks).

## Implementation strategy of the project

### Bottom-up approach & community involvement

Technical assistance has been provided by MIA to local communities (women self-help groups, farmer groups) and field partners engaged in setting up Community Based Mutual Aid Schemes (CBMAS). Customised insurance packages that cover health, crop and livestock risks, and that are priced at actuarially accurate premiums, are designed based on local risk

**"I believe insurance will be beneficial if it covers our real risks, and if it delivers what was agreed, and no one should cheat us and get away with it. Here the Self Help Group is working in full swing and any insurance provided by this Group will be beneficial for us"**

Manoj Lal Prasad, Phulwaria, Muzaffarpur

<sup>1</sup> Phase I was launched in 2012, with funding by the Swiss Agency for Development and Cooperation (SDC) until 31.3.2017.



exposure and community priorities. The target communities are involved in detailed discussions of the design of the insurance packages, and in finalising a single package that meets needs and willingness to pay, from several short-listed options (through consensus-building exercises). The CBMAS are governed by the community through well-defined “key actors” that community members select based on the trust they enjoy among their fellow villagers. Once selected, these persons are trained in the skills they require to carry out the governance and operation roles within the schemes. In a nutshell, communities set up their own mutual insurance schemes in their social context and take the lead in operations. This bottom-up approach guides communities to manage and own the entire process, building upon and mobilising each community’s social capital and other resources. Across our schemes, no premium subsidies are provided, so the community members pay the full premiums to cover the risks and local administrative costs.

#### **A farmer’s app to increase farmer participation**

In light of our experience with CBMAS and our efforts to overcome farmers’ reticence to enrol in crop insurance on a voluntary basis, we are testing the assumption that small and marginal farmers are more likely to voluntarily buy crop insurance when they can obtain relevant information with bearing on this year’s decision to join and pay at the

point and time of considering enrolment (e.g. what would have been last year’s payout had I joined?). The questions are straightforward and fair, but answering them requires a great deal of information (e.g. on the weather data for previous years) and has thus far never been available in the field. MIA has thus developed the prototype of a user-friendly app which can provide answers to farmers’ questions through real-time link to large datasets, for reference as never before. Input fields on the app will enable farmers to query the simulated results of customised insurance uptake options, by seeing the consequence of adding or removing the sum insured for various crop covers as well as the consequence of changing maximum payouts for each cover retained (e.g. for insufficient/excess rainfall, high temperature). This will be done in real-time and in the field, applying the current premiums and historic payouts. In these simulations, thresholds and start/end dates of different phases are identical to policy terms, to ensure that the overall risk transfer index is not compromised. The price information provided to the farmer will reflect the risk based on historic weather data and pricing methodology/loadings of the empanelled insurer. The tool basically bridges the gap between farmers who need risk management solutions and insurers offering to underwrite such risks. The app aligns with the decision process of farmers related to buying insurance (collective vs. individual decision taking, peer-to-peer approach and involvement in product design). Furthermore, this aggregation

“As agriculture is no longer a profitable profession, farmers are resorting to other jobs for survival. Repeated droughts are making matters worse. I was utterly disappointed by the losses I was bearing due to insufficient rains and was ready to use my land for anything other than agriculture. It was then when I saw some hope in MIA’s Swasthya Kamal crop coverage. When we farmers discussed it, we realised that the scheme will at least give us some respite from the big losses we incur.”

Rakesh Kumar, beneficiary of MIA’s crop insurance scheme (Swasthya Kamal) in Vaishali, Bihar, India

and peer-to-peer marketing makes it easier to bridge the gap between demand and supply.

#### Bundled insurance and multitier underwriting

The RES-RISK project addresses several risk categories – all potentially worsened by climate change – in a composite way. As we have evidence that rural communities perceive risks in a comprehensive way, but at present can buy only isolated (“silo”) policies, we present insurance as a ‘one-stop-shop’ transaction for multiple classes of risks and for all aspects of their insurance dealings through a single window (making it unnecessary to deal with different agents and different policies). This is more than just added transactional convenience for members; it also enhances sustainability of the scheme, considering that members that have a positive claim experience with one risk are more likely to insure other risks, as well as to renew in subsequent years. This reduces the cost of acquisition of business for external insurers that underwrite group policies of entire communities. Thus, bundled coverage provides better scope for increasing the pool size (higher membership) and loyalty to the scheme (higher renewal rates); both these trends enhance the financial sustainability of the scheme.

The multi-risk bundling opens the road to apply multi-tier underwriting. CBMAS mutualise health risks fully, but cede 100% of crop risks to external insurers. And, the community and the insurer enter into a quota-share arrangement for livestock insurance, with the community

retaining 40% of the premiums and risks, and the insurer 60%. The multi-tiered underwriting arrangements have enabled CBMAS to secure higher coverage than would have been prudent by mutualising all risks. This also reduced the risk of underinsurance by community members and the insurers’ risks related to information asymmetries.

#### Value added services

Under our model of CBMAS, the support to farmers makes a link between insuring risks and providing proactive support to farmers on how to do better farming. We have evidence that the provision of value-added services (e.g. deworming and vaccination of insured animals, advisory on best practices in agriculture, and health talks) has increased demand for insurance.

### Innovative research: “Climate Cost of Cultivation”

The transactional changes in business process that have been introduced are, clearly, improving farmers’ willingness to engage and to play by the rules (reduction in fraud/moral hazard/adverse selection, quick settlement and low administrative costs). These do not, however, resolve “basis risk”, or the risk of mismatch between insurance payouts and actual losses, which is endemic to index insurance. The higher the basis risk is, the less value insurance has for farmers. This is why RES-RISK project developed a new index model called “Climate Cost of Cultivation” (CCC). This model has been published in The Geneva Papers on Risk and Insurance - Issues and Practice<sup>2</sup>, and received the prestigious Shin Research Excellence Awards 2016 bestowed by the International Insurance Society (IIS) and The Geneva Association. The relevance of the CCC index method lies in: (i) Providing an algorithm to implement the “polluter pays” principle whereby farmers can be relieved from paying for consequences of carbon emissions they did not produce, (ii) developing an innovative crop index insurance that considerably improves the correlation between losses and payouts (a major ailment of weather index-based insurance).

<sup>2</sup> Jangle, N., Mehr, M. & Dror, D.M., (2016). Climate Cost of Cultivation: A New Crop Index Method to Quantify Farmers’ Cost of Climate Change Exemplified in Rural India. The Geneva Papers on Risk and Insurance - Issues and Practice, Volume 41(2), 280-306. doi:10.1057/gpp.2016.6

**6,504 households or 12,987 individuals enrolled for health by 2016 (1,697 households or 3,662 individuals in 2014).**

**378 livestock covered in 2016 (75 livestock in 2015)**

**327 and 361 acres for kharif (autumn) and rabi (spring) crops in 2016, respectively (80 and 97 acres, respectively in 2015).**



The CCC model is based on algorithms to quantify the added cost to farmers of the estimated combined impact of climate change related to four climatic situations:

- insufficient rain, leading to additional irrigation costs;
- excess water, leading to drainage costs (as a proxy to crop loss);
- high temperatures, leading to yield loss; and
- increasing concentration of atmospheric CO<sub>2</sub>, (which has a fertilising impact on crops, resulting in reduced costs / higher yields).

The first novelty of CCC is that the new index considers soil moisture at root level as the major indicator for plant growth. In typical index insurance, other climatic parameters used are merely proxy indicators. In modelling daily soil moisture, both climatic parameters (e.g. daily rainfall, maximum temperature, minimum temperature, relative humidity, wind speed and solar radiation) and relevant non-climatic parameters (e.g. groundwater depth, soil type and elevation topography) are taken into consideration as these have significant influence on crop yields as well. Additionally, the modelling of agricultural droughts has been improved considerably by considering the residual impact of precipitation in the preceding season on soil moisture.

The second essential insight is that the CCC informs the assessment of the risk to farmers due to climatic changes over time, and by how much. The method shows how to implement the “polluter-pays” principle. Applying this principle would reduce the premium significantly and enhance the likelihood that farmers would buy index insurance that compensates their risks. Considering that the incremental climate change-related addition to the pure risk premium is specific to each location, crop and season, our CCC method offers an actionable means to contextualise the quantification of this cost component, so that its subtraction from premiums could be applied in practice.

The CCC model has been exemplified for winter wheat in Bihar, and the model can be applied to other crops, seasons and locations (once the necessary calibration is done). The efficiency of CCC has been examined by comparing it to typical index insurance as implemented in the same location for the same crop by commercial insurers, and both indices to wheat yield and cost of cultivation data published by the Government of India. The correlation of CCC payouts with actual yield losses is improved by a factor of ~3.8 over typical index insurance results (74.1%, compared to 19.6%). For the same quantum of reduction in farming risk, a much lower premium has to be paid for the CCC index. ■



# A mobile-based application as a frugal solution to bring down the cost of livestock insurance

By M.K Balachandran



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As per the nineteenth livestock census of India (2012), livestock contributes around 4.11% to the national GDP and around 25.6% to the agricultural GDP of the country. While the share of agriculture in GDP in India has declined over the years, the share of livestock in agricultural GDP has been steadily on the rise. This is due to the steady increase in population and inefficient distribution of resources which has left a majority of poor households with very small or no agricultural land to be engaged in cropping activities. It is estimated that approximately 100 million people derive their livelihood from livestock either as a primary or secondary source of income. Livestock-related activities help to maintain a daily influx of income for these households. India ranks first in terms of its livestock wealth across the world.

However, statistics of livestock insurance in India show that only 7% of the total livestock population was insured in 2009 and only 10% in 2012. As formal risk-management services are under-developed, cattle owners resort to borrowing from moneylenders or selling assets that push them deeper into poverty. Hence, there lies a very big opportunity for providing low-cost insurance to the low-income population to help protect their livelihoods.

When HDFC ERGO General Insurance Company first ventured into this segment, we faced many challenges and realised that these challenges were responsible for the dearth of insurance companies providing livestock insurance products. The major challenges can be summarised as follows:

## → High cost of issuance

There is high cost of issuance especially in rural locations. This is due to geographical challenges and conventional distribution processes that increase the cost of distribution. In the traditional process of livestock insurance, a health certificate and a cover note have to be issued manually, a photograph of the animal with the tag has to be taken, and then all these details have to

be couriered to the insurance office for policy issuances. These practices increase costs as well as turnaround time for policy issuance.

## → Fraudulent practices

It was observed in some of the claim settlement cases that the tags were purposefully transferred to dead cattle which do not have an insurance cover and the same was then submitted for claims. It was difficult to curb such malpractices.

## → Lack of historical data for proper pricing

There is lack of regional data (breed wise), which is essential to adopt technical pricing.

These challenges resulted in increasing loss ratios in this segment over the years and have been preventing companies from tapping into the huge market potential in livestock insurance. Consequently, insurance penetration levels in India are as low as 10%, despite being a country which has the largest livestock population in the world. While exploring a model that could be scaled up in a sustainable manner, it was assessed that a mobile technology-enabled process would be the best solution. The idea was first presented at a Swiss Re Conference in September 2015 in Mumbai and won the best innovative idea award, after which the company decided to pilot the product in the field. A coordinated effort brought together sales people, IT and claims teams who brainstormed and worked together in designing and developing a mobile-based application for cattle enrolment and claim settlement. The development of the mobile application itself took more time than expected, as it was the first of its kind in the livestock sector, and was handled by the company's in-house IT team. The first prototype of the application was ready by June 2016. In the pre-pilot test, which ran for close to two months, connectivity and real-time data transfer at various interior locations were tested. After a year of consolidated efforts by various teams of the company in developing and testing the product, it was finally ready to be launched in December 2016. The biggest challenge we faced

thereafter was in convincing the veterinary doctors to migrate to the online platform as they were not used to such kind of cattle enrolments. Training the field staff to use this technology was another challenge as most of them were from rural locations and were not comfortable with smartphones in the beginning. We also slightly modified the user interface in the application to include more pictures rather than text. This was done to make it easier for the field staff to manage and complete enrolments in less than 3 minutes, which enhanced the scalability of the application. The uniqueness of this idea can be summarised as:

- The mobile application was fully developed by the in-house team and there was no need for external funding
- Once the application was developed and systems were integrated, which is just a one-time investment, there were no recurring costs involved.
- Scalability can be achieved very fast by training additional field staff for the use of the application.

In the new process, the health certificate and animal details are entered through the application which also captures a live photo of the animal along with the identification tag. The details then hit HDFC ERGO's server in real-time for an instant policy issuance. Following this step, the customer receives an SMS regarding the policy issuance on his mobile phone and its copy reaches the customer by post/courier. The distinct advantages of such a technology-driven process are summarised below:

- Reduction in Turn-Around Time (TAT): The biggest and most favourable result is the reduction in the claims' TAT. Before, it used to take 15-20 days to settle claims from the date of death of the animal. But now, the same can be reduced to 3 days with the use of the mobile application. This would increase customer satisfaction levels as the

customer has to wait for only 3 days to get his account credited with the claims amount. Faster claim settlement is one of the ways to support farmers at the time of need.

- The application-based approach will dramatically drive down operational costs involved in disbursing, tracking and settling claims which would then translate into significant reduction in premium price.
- Further, the new process helps in real-time identification of the animal through the information extracted from the insured database at the time of claims. This prevents false claims to a large extent.
- Also, the use of technology helps in maintaining a clean database in the prescribed format. This can then be accessed for use at any point of time in the future.

Within 2 months from the date of launch of the mobile app, HDFC ERGO has already tagged 1018 cattle on to the mobile-based application. And we can confidently say that this is just the tip of the iceberg.

The mobile technology will enable online policy issuance at low cost, enhance scalability, avoid fraudulent practices and help settle claims faster, thereby gaining trust and confidence of the farming community.

When more insurance companies adopt application-based enrolment and claim settlement processes in the livestock sector, a cost-effective and scalable business model can emerge.

In the long run, the mobile-based application technology will help the livestock insurance sector transit from poor to high penetration levels and become a low-cost high-volume cash cow for the sector. This in turn would benefit more than 50 million households in India who depend on livestock for sustenance and thereby lift up the lives of the rural communities. ■

# Safeguarding food security in Bangladesh by introducing weather-based index insurance

By Farzana Chowdhury



**Farzana Chowdhury,**  
Managing Director and  
CEO of Green Delta  
Insurance, Bangladesh

**F**ood security and nutrition are among the basic needs of every human being. In Bangladesh, some impressive gains in recent years can be observed in the food security sector. Led by a team of national experts and guided by a wide range of stakeholders across the country, the government is putting considerable efforts into achieving zero hunger in Bangladesh. Green Delta's weather index-based agricultural insurance supports food security and aspires to create a new beginning for the Bangladeshi people.

## Background

Agriculture employs 48% of the total labour force and contributes to 19% of the country's GDP with more than 85,000 km<sup>2</sup> of agricultural land (around 63% of total land area). During the financial year 2013-2014, four state-owned commercial banks, three specialised banks, 38 private commercial banks and nine foreign banks disbursed a total amount of more than 16 million Taka (around EUR 185,000) in agricultural/rural credit with an increase of 9.34% compared to fiscal year 2012-2013<sup>1</sup>. In 1976, the Sadharan Bima Corporation, which is the only state-owned non-life insurer and reinsurer in Bangladesh under the Ministry of Finance, introduced agricultural insurance with a coverage of 18,782 farmers and 23,795 acres (96 km<sup>2</sup>). The total amount of premiums reached 3.96 million Taka (EUR 45,865) with incurred losses reaching 19.768 million Taka and a very high loss ratio reaching 500%. The agricultural insurance programme is implemented on both paddy and potato crops on a small scale with the support of the Asian Development Bank.

## Objectives of the Government of Bangladesh

The Government of Bangladesh aims to make the nation self-sufficient in terms of food. It also thrives to achieve the following objectives<sup>2</sup>:

- Ensure a profitable and sustainable agricultural production system and increase the purchasing power of the farmers.
- Preserve and develop land productivity.
- Reduce excessive dependence on any single crop to minimise risk.
- Increase production and supplies of more nutritious food crops, thereby ensuring food security and improving nutritional status.
- Take up programmes for the introduction, utilisation and extension of bio-technology.
- Produce and supply agricultural commodities as required by the industrial sector.
- Take appropriate steps to develop an efficient irrigation system and encourage farmers in providing supplementary irrigation during drought with a view to increasing cropping intensity and yield.
- Establish agriculture as a diversified and sustainable income-generating sector through strengthening of the farming system approach.<sup>3</sup>

1 Bangladesh Bank. Agricultural & Rural Credit Policy and Programme for the FY 2013-2014. Dhaka: Agricultural Credit & Financial Inclusion Department.

2 Sustainable Development Networking Programme (SDNP) Bangladesh. Objectives of the National Agriculture Policy. Retrieved from <http://www.sdnbd.org/sdi/issues/agriculture/national-policy/objectives.htm>.

3 It is an approach for developing farm-household systems, built on the principles of productivity, profitability, stability and sustainability.

**Table 1:** The current landscape of the insurance industry in Bangladesh

<b>Insurance penetration<sup>4</sup></b>	0.09%
<b>Life insurance penetration</b>	0.07%
<b>Non-life insurance penetration</b>	0.02%
<b>Companies offering non-life insurance</b>	45
<b>32 companies offering life insurance</b>	32
<b>3 Non-life companies offer index insurance</b>	3
<b>42 weather stations in Bangladesh</b>	42 weather stations; a total of 300 are needed to cover the whole area

- Take effective steps to ensure input supplies to the farmers at fair prices in a competitive market and remove difficulties at the farmers' level.
- Create opportunities for establishing agro-processing and agro-based industries
- Develop a contingency management system to combat natural disasters.

Many challenges still remain in providing insurance to low-income people such as lack of insurance awareness and product pricing; lack of weather data and technology infrastructure; lack of government incentives and regulations and; low capacity building of distribution channel partners. Table 1 shows some figures related to the insurance industry in Bangladesh.

## Green Delta Insurance Company (GDIC)

Besides its traditional insurance portfolio, GDIC introduced in the past year a personal line of products such as the Nibedita comprehensive insurance policy for women, and two weather index-based insurance products for smallholder farmers. NGOs and agricultural input suppliers are used as distribution channels for these products which are currently not subsidised by the government. GDIC partners with Access to Information (a2i), the first innovation Lab+ developed by the Prime Minister's Office to ensure easy, affordable and reliable access to quality public services for all citizens of Bangladesh. Initiated by the Government of Bangladesh, the access of the rural and semi-urban populations is in the form of small booths to provide various civil services which include, among others, opening of a bank account, mobile financial services, health services and insurance products.

GDIC also partners with Dnet and the ICT Division at the Ministry of Posts, Telecommunications and Information Technology of the Government to build the capacity of 1000 women to work as GDIC agents for the Info Lady Program. GDIC and the International Finance Corporation (IFC) developed data collection by partnering with Skymet Weather Services Pvt. Ltd. India which provides weather forecast and solutions. 200 automatic weather stations and interpolated stations were installed to each cover an area of 10 km.

GDIC is working with different distribution networks like agricultural input suppliers, seed companies, and financial institutions. Their current focus is on cash crops like vegetables, hybrid rice, industrial potato, and ground nut. GDIC is organising workshops and seminars for capacity building of stakeholders including distribution channels to sell weather index insurance. It is also trying to invite foreign investment funds to invest in this growing sector.

Currently, GDIC has two ongoing projects: One with Pran, a food processor and agribusiness company for cassava and the other with Renaissance Enterprise, a Bangladeshi agribusiness, for tomato. Recently claims have been settled in Khulna as one of the covered farmers was affected by a wet spell and faced big production losses. The claim, the first of its kind in the insurance sector in Bangladesh, was promptly settled, paving the way for successful index insurance programmes in the future.

## The way forward

GDIC is planning to build on the coverage of the country's leading telecommunication provider, Summit Communications, which built access to over 33,000 km of fibre-optic network across the country, covering all 64 districts and their

<sup>4</sup> Insurance penetration - refers to a product's sales volume relative to the sales volume of competing products, usually expressed as a ratio of premium to Gross Domestic Product.



2400 base transceiver stations (BTS) in both urban and rural areas. In terms of government support, there is a need to adapt regulations to weather-based index products and support farmers by providing premium subsidies as in neighbouring India. In the year 2017, GDIC plans to introduce livestock insurance in addition to index insurance for other crops. It looks forward to partnering with companies like British American Tobacco, USAID, Sajida Foundation, Syngenta, National Bank, AB Bank, Prime Bank and Bank Asia among others. ■

# Exploring challenges in scaling up agricultural insurance for smallholder farmers

By Hui Lin Chiew



**Hui Lin Chiew**, Regional Coordinator for Asia Pacific, the Secretariat of the Access to Insurance Initiative, Germany

**I**n Asia, 80% of food supply is produced by smallholder farmers, while in some countries in Sub-Saharan Africa they are responsible for as much as 90%. Agricultural insurance, therefore, holds great potential for not only protecting some of the most vulnerable people but also helping support national policy objectives in areas such as food security, natural disaster resilience and climate change adaptation. This potential is increasingly recognised by policymakers. However, few supervisors worldwide have a clear approach to index-based insurance. Agricultural insurance raises unique challenges due to the inherent dynamism of the sector itself, the nature of the associated risks and the diversity of stakeholders who are critical to its success.

*With this in mind, and to try and promote and facilitate better multi-stakeholder dialogue, the Access to Insurance Initiative (A2ii) together with the International Association of Insurance Supervisors (IAIS) and the Microinsurance Network plan to hold three such dialogue events (Consultative Forums) throughout the course of 2017 – one in Latin America, one in Africa and one in Asia. This article will elaborate on the insights from the first of this series, held on March 14th, 2017 in Singapore. This event brought together policymakers, supervisors and industry practitioners from across the Asian region, as well as further afield, to share and compare experiences and challenges, identify emerging best practices, as well as areas where more work needs to be done.*

## Why agricultural insurance matters to policymakers

Agricultural insurance can help achieve many national policy objectives. At the farmer's level, it provides a buffer against production risk and income volatility. At the meso level, it protects key components of the agricultural supply chain. At the macro level, it supports food security, national disaster risk resilience and climate change management. Internationally, there is clear recognition among policymakers of the need to address these policy issues, as can be seen from the United Nations' Sustainable Development Goals, the Paris Agreement and the G7 InsuResilience Initiative. Regionally, governments increasingly participate in or are familiar with sovereign risk pools<sup>1</sup>. This has come with, albeit to a lesser extent, more focus on the role of agricultural insurance itself.

While progress varies between countries, some countries have had government-led or supported agricultural insurance for many years<sup>2</sup>. During the Forum, representatives from Thailand, the Philippines and India, shared their experiences with the state-supported crop insurance schemes which have existed since the late 1970s, with the state providing significant financial, promotional and implementation support.

→ India has multiple streams of state-supported crop index insurance schemes. These include the National Agricultural Insurance Scheme started in 1999, followed by the Modified National Agricultural Insurance Scheme in 2010. Most recent is the 2016 Prime Minister Fazal Bima Yojana scheme, for which the 2017 budget has been doubled from 2016.

1 E.g. the African Risk Capacity for the African Region, the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company for the Caribbean and Central America Region, and the Pacific Catastrophe Risk Assessment and Financing Initiative Facility for the Pacific Island countries.  
2 Hess, U. & Hazell, P. (2016). *Innovations and Emerging Trends in Agricultural Insurance*. Eschborn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

- Thailand's National Rice Insurance Scheme is an indemnity-based scheme started in 2011 that helps farmers to manage natural disaster risks by providing a top-up payment to the existing Government-run disaster relief scheme. It also enables better management of the government budget by reducing and smoothing public spending on ex-post disaster relief, while sharing the financial burden with the insurance industry (16 local insurers underwrite the scheme).
- In the Philippines, the Philippines Crop Insurance Corporation has provided crop insurance for over three decades. Government and financial institutions subsidise 60%-70% of premiums. In 2012-2015, the Remote Sensing-based Information and Insurance for Crops in Emerging Economies was implemented with the Insurance Commission, the Department of Agriculture, the Philippine Insurers and Reinsurers Association, and a private insurer.

not incentivised to apply prudent agricultural practices in terms of risk reduction. Premiums are thus very costly. This explains why many large-scale agricultural insurance schemes for smallholder farmers are largely state-led and subsidised. Even with state involvement, financial sustainability and delivery – such as timely claims payouts – are constant challenges.

A potential solution has emerged in the form of index insurance, where farmer payouts are based on an index which acts as a proxy for production losses. This addresses moral hazard and eliminates the need for loss adjustment. India, Kenya, the Philippines and Sri Lanka have some form of index agricultural products, both area-yield and weather index-based, some combined with indemnity-based elements. A lot of literature has discussed the challenges of index insurance – robustness of the index and basis risk, availability of data, farmers' understanding – explaining why many index insurance pilots have not scaled up into sustainable schemes. SANASA Insurance of Sri Lanka however provides an interesting counter to this narrative – they seem to have found initial success with their weather index insurance and attributed it to a few factors: Affordability and a flexible payment plan, how the index is linked to payouts, good distribution networks and bundling with other forms of coverage such as personal accident, hospitalisation, funeral benefits and property.

## Comparing indemnity and index-based agricultural insurance

The difficulty in scaling up agricultural insurance for smallholder farmers stems partly from the technical aspects of agricultural insurance. The traditional form of agricultural insurance is indemnity-based, meaning that farmers are compensated for the actual amount of losses arising from a number of named perils. This gives rise to two issues: A costly loss adjustment process and moral hazard, as farmers are

## The link to inclusive insurance and regulations

Why does smallholder agricultural insurance matter to the insurance supervisor and inclusive insurance? The idea of inclusive insurance is

**Figure 1:** Key issues for insurance supervisors to consider

Supervisor's role	Regulatory framework	Product approval process
<ul style="list-style-type: none"> <li>• Get involved at product development stage for state-driven schemes and donor-driven pilots</li> <li>• Clarify regulatory framework or treatment of index insurance</li> <li>• Enable innovation and scaling up - proportionality in practice</li> <li>• Supervise and monitor pilots</li> </ul>	<p>Key issues to clarify:</p> <ul style="list-style-type: none"> <li>• Product definition and features</li> <li>• Determining insurable interest</li> <li>• Data requirements</li> <li>• Basis risk including any requirements or insurer to mitigate</li> <li>• Consumer protection requirements including marketing, disclosure, claim process</li> <li>• Product or pilot approval process</li> </ul>	<p>Key aspects to assess in product submission:</p> <ul style="list-style-type: none"> <li>• <b>Product design:</b> Suitability, triggers and deductibles, basis risk, aspect of agricultural value chain covered</li> <li>• <b>Underwriting and pricing:</b> Robustness of data and index, pricing assumptions</li> <li>• <b>Distribution:</b> Insurable interest, roles and responsibilities, end-to-end process</li> <li>• <b>Disclosure and marketing:</b> Explaining index insurance, training</li> <li>• <b>Claims process:</b> Time to payout, basis of claims, ensuring payment</li> <li>• <b>Reinsurance and risk management</b></li> </ul>

Based on presentations by Craig Thorburn, World Bank; Agrotosh Mookerjee, Risk Shield Consultants; and Joseph Owuor, Insurance Regulatory Authority of Kenya.

to provide access to insurance for the excluded or underserved. In most countries, smallholder farmers are the lowest-earning and highly vulnerable to risk, while being in rural locations that are harder to reach. They are well aware of the risky nature of their work. As a panelist of the 2017 Consultative Forum in Singapore put it – “Farmers face this risk every day”. However, judging from a case study in the Philippines that was presented by the GIZ Regulatory Framework Promotion of Pro-Poor Insurance Markets in Asia (RFPI), this does not necessarily translate to farmers’ recognition of insurance as a means of coping with this risk, and therefore raises questions about farmers’ willingness to pay for insurance. In short, smallholder farmers’ need for access to insurance is arguably very high, but affordability and demand are weak.

So far, few supervisors worldwide have a clear approach to index-based insurance, and not much regulatory expertise<sup>3</sup> on this topic has been accumulated. In some countries, insurance supervisors are not involved, or are only involved when index insurance pilots are already well underway rather than at the development phase. This however, did not appear to be the case in the countries discussed in this forum. In terms of issuing a regulatory framework, Kenya and the Philippines have been at the forefront. The Insurance Commission of the Philippines issued an Agriculture Microinsurance Framework in 2015 which recognises and sets requirements encompassing both indemnity and index-based insurance. The Insurance Regulatory Authority of Kenya has actively supported the development of pilots on index-based insurance, with pilots having been launched since 2010 and currently involving about seven insurers. Index-based regulations are currently underway. Figure 1 highlights some of the regulatory issues discussed during the Forum.

## Challenging times

On the whole, panelists were clear that the journey has not been easy. Delivery is one issue – given heavy reliance on local organisations or in times of large-scale natural disasters, how does the supervisor or other involved policymakers ensure that enrolment, premium collection and claims payment are done in a manner that ensures fair treatment of the

consumer? Challenges also lie at the level of key decision-makers. Because agricultural insurance crosses into the domain of several policy spheres, organising large-scale schemes or upscaling pilots would require coordinated support of stakeholders from many backgrounds and motivations. Thailand’s approach in the implementation of its indemnity-based scheme was to form a multi-stakeholder steering committee comprising the Ministry of Finance, the Department of Agricultural Extension, Ministry of Agriculture and Cooperatives, Bank of Agriculture and Agricultural Cooperatives, Office of Insurance Commission and the Thai General Insurance Association. India also stressed the necessity of continuous financial support from the Government as a condition for scaling up and success.

Demand-wise, there is still a lack of understanding among those involved in providing agricultural insurance as well as farmers themselves. On the farmers’ end, all panelists agreed that a lack of awareness and understanding of insurance is still a key roadblock, especially given the complexity of index insurance. On the providers’ end, the concern was that understanding of the agricultural sector may not be deep or nuanced enough, sometimes resulting in those involved in designing and providing index insurance being caught up in the technical details of the underwriting and modelling rather than more closely aligning with farmers’ priorities.

## Looking ahead

What does the future hold, then, for agricultural insurance? Panelists offered some guidance on the way forward.

→ **Key stakeholders need to agree to a formal public-private partnership arrangement with specific targets and strategy.** Core issues that need to be addressed include ownership and sharing of data, which often rests with multiple agencies and is not publicly available or in a form that is suitable for insurance purposes. Another is an agreement on how private and subsidised products should complement one another. A core question that emerged was: What is the longer-term role of state subsidies?

3 As of March 2017, the IAIS is developing guidance on index insurance, aimed to be released for consultation in the next few months. A2ii is commissioning a study on current regulatory approaches to index insurance, expected to be published late 2017.



- **The use of technology needs to be institutionalised.** This should go beyond technology typically associated with the agricultural sector, and consider applying technology from innovations in the wider inclusive market. One form of technology that has achieved massive scale is mobile insurance. In the long run, the need for subsidies could be reduced if technology can help make the programme more cost-efficient.
- **There is a clear opportunity and benefit to integrate agricultural insurance with other risk management measures or policy spheres.** The DHAN Foundation in India provides an example where insurance is offered alongside other forms of risk management measures such as land development, water conservation, crop and livelihood diversification and credit support. Particularly for disaster risk management, there is now adequate technical knowledge for policymakers to design an efficient

arrangement for risk sharing between the micro, meso and macro levels and reduce reliance on post-disaster relief. Insurance can be utilised in various ways at each level. Global risk markets currently also offer affordable rates for risk transfer. However, these opportunities have not been fully explored.

The ideal endgame for inclusive insurance is that the underserved and excluded voluntarily buy insurance. This means buying not because it happens to be embedded into another core product or because they are compelled by legislation or market practice – but rather because they choose to buy, in an informed manner, in a contestable and competitive market. Is this achievable for agricultural insurance? Is index insurance the solution? There is no firm answer yet, and some fundamental questions remain unanswered. The learning and dialogue between and within countries – among policyholders, supervisors, industry practitioners – must continue. ■

## *What are Consultative Forums?*

Consultative Forums are a series of events jointly organised by the IAIS, A2ii and the Microinsurance Network. They aim to stimulate dialogue between policymakers, supervisors and the industry that is critical in fostering knowledge and sound policymaking in the field of inclusive insurance.

The 9th Consultative Forum was held in Singapore on March 14th 2017 alongside the 12th Annual Conference of the Asian Forum of Insurance Regulators. The agenda and all presentation materials can be found on the A2ii and Microinsurance Network websites. The conversation continued at the 10th Consultative Forum, held this past 24-25 May in Kampala, Uganda and will progress even further at the 11th Consultative Forum to be held in November 2017 in Lima, Peru.

# Regulatory and supervisory challenges of index-based insurance

By Haykel Ben Hadj Sghaier



**Haykel Ben Hadj Sghaier,**  
Regulatory Expert,  
Tunisia

**I**ndex-based insurance (IBI), which is a risk transfer mechanism consisting of (initially defined) payouts to its policyholders in the case of occurrence and/or measurement of a specific index, appears to be an innovative tool that can contribute to developing and complementing insurance offerings and allowing a wider range of the population to have access to risk mitigation coverages. IBI products differ from indemnity-based insurance products by their design which is based on specific indices and the corresponding payouts, which are made when the defined index is triggered and are not based on the proof of a specified loss.

Insurance regulators and supervisors wishing to enable the distribution of index insurance products in their market face a variety of challenges related to the complexity and innovative nature of these products. It is also challenging in relation to the core mission of insurance supervisors concerning ensuring the stability of the market and the fair treatment of consumers and for which three main pillars should be observed:

- Adopting an adequate regulatory and supervisory framework;
- Ensuring that the products provide value to the consumers, and;
- Enhancing consumers' awareness and trust.

## Enabling proper regulatory framework

IBI is a non-indemnity insurance in which the fundamental feature is that the liability to make a payment under the related contract and the amount of the payment are triggered by/ based on the measured value of an objective and independent index. The liability is therefore not based on the proof of a specified loss or an assessment of the amount of the insured's actual loss. Hence, setting a regulatory framework that is dedicated to index insurance is needed to reflect the specificities of such products.

The regulatory framework should cover: The definition of an IBI, the definition of an index, the insurable interest, the basis risk, and specific requirements such as no cancellation, technical provisions requirements, product approval processes, reporting, capital requirements, ongoing supervision, consumer protection, and market conduct requirements.

In the absence of a proper regulatory framework, some jurisdictions have allowed the launch of pilot projects, mostly related to weather-based agricultural index insurance, in order to test the feasibility and to build knowledge and experience in this field, which can be used later for the development and scalability of IBI products.

## Availability of data and cooperation between local authorities

For the purpose of pricing, the design of index insurance products requires specific data records, such as historical records of a chosen parameter which are also needed to trigger the payouts. Such data should be made available by data providers and be of adequate quality, to allow insurance companies to use it for product development. In countries where adequate data is lacking, involved authorities such as the ministry of agriculture, national meteorological institutes, and national institutes of statistics, should work together to enable an environment that promotes the collection of reliable and quality data. Additionally, a multidisciplinary team is needed to use the collected data and undertake market research. In the case of agricultural index-based products, the multidisciplinary team shall at least be composed by an agronomist, a statistician and an actuary. When the product is launched as a pilot project, the insurance regulator can work jointly with the multidisciplinary team and other stakeholders in order to follow up the tested product and measure its performance.

## Capacity building of supervisors and the industry

Due to its innovative nature and the lack of expertise in the field of index insurance, knowledge of both regulators and the industry is needed in the markets wishing to develop index insurance. Capacity building will allow the insurance industry to understand, to do market research, to design, to underwrite, to distribute index-based insurance products through new distribution channels, and enable supervisors to oversee these products ensuring that simple, affordable, appropriate and valuable products are offered to customers.

## Ensuring that value added services are offered to customers

In addition to designing and offering products that meet customers' needs, the frequency and amount of payouts may be challenging. The frequency of payouts may influence the product value that is perceived by the client. For instance, a product that is expected to pay out once in ten years may negatively affect the perception of the client to this product, especially in the case where it was not clearly communicated to them. On the other hand, the amount of payouts may not be sufficient compared to the actual loss incurred or may be higher than the actual loss occurred. This is reflected by the basis risk, which is the difference between the payout as measured by the index and the actual loss incurred by the insured. The basis risk remains the major problematic feature of index-based insurance.

## Building consumer awareness and trust

IBI is a new concept to the insured, and therefore a particular consumer education effort should be made to help consumers understand these products and the risks they cover. Properly explaining index-based insurance to the insured will help them access these products, understand them, and overcome any potential gap between their expectations and the effective payouts they will receive. This will contribute to increasing customers' trust.

## Sharing country experiences

Various jurisdictions, such as India, Kenya or Senegal are testing IBI products and are working on developing legal and related regulatory frameworks. Even if market characteristics and consumer needs differ from one country to another, sharing results, experiences, and lessons learned can be beneficial and can help them overcome obstacles in developing IBI offerings. This can be organised at regional levels between countries showing a similarity of socio-cultural context and structure of insurance markets.

The potential of IBI is to contribute to increasing financial inclusion and providing access to complementary risk mitigation tools to a wider range of the population. It is of high interest to insurance regulators wishing to enable the delivery of innovative services in their markets. A tight cooperation between regulators, insurers and involved parties should be put in place in order to set the basis for the development of IBI products and solutions that are relevant to the specific country and a valuable service to consumers. ■

The following two interviews illustrate how the insurance commissions in Kenya and Ghana see the opportunity to provide agricultural index insurance as a means to increase agricultural productivity and enhance livelihoods of smallholder farmers vulnerable to climate change. They also provide insights for policymakers and supervisors in adapting regulatory frameworks to support these initiatives.

## Interview



**Joseph Owuor,**  
Senior Supervision  
Officer, Insurance  
Regulatory Authority,  
Kenya

# Joseph Owuor, Insurance Regulatory Authority, Kenya

Conducted by **Jenny Glaesener-Nasr**, Senior Development Coordinator, Microinsurance Network

***Mr. Owuor, there's a lot of talk in the microinsurance community right now about the consequences of increasing severity and frequency of catastrophic events. Are you seeing the impact of climate change on agricultural production and smallholder farmers in Kenya?***

Yes we see it a lot. It is estimated that 56% of our country population is food insecure. About 2 million Kenyans are constantly on food relief aid and it reaches 4 million whenever rains fail.

Kenya remains vulnerable to frequent and extremely expensive natural disasters. Frequent disasters have repeatedly caused catastrophic damages to the Kenyan agriculture sector, characterised by high frequency of flooding (every year) and drought spells (every 3-4 years).

Between the years 2000 and 2011, the Government of Kenya spent on average 4.2 billion Kenyan Shillings (KES) on post-disaster relief programmes per year. Between the years 2008 and 2011, total drought losses to the Kenyan economy were estimated at KES 968.6 billion leading to a reduction of GDP by 2.8% each year. Last year alone, Kenya experienced the worst drought in 15 years and the situation has persisted in some parts of the country to date.

***With that in mind, what does the agricultural index insurance market look like in Kenya?***

We currently have two major schemes supported by the Kenyan Government and designed as a partnership between

the government and the private sector with assistance from the World Bank Group.

- The first is the Kenya Livestock Insurance Program (KLIP), which seeks to help vulnerable pastoralists effectively manage the impact of severe droughts on their livestock and livelihoods. The government pays a premium for pastoralists enrolled in the programme for up to five tropical livestock units. One unit represents one cow, 10 goats, 10 sheep or 0.7 camels, with the payout per unit set at USD 140. The amount is based on how much it would cost to keep animals alive rather than replace them. This is a large scale forage scarcity drought index insurance programme rolled out in selected counties of northern Kenya. It uses satellite imagery to determine forage availability, with payouts triggered when lack of rain reduces grazing by 20 percent compared to ideal conditions.
- The second is the Kenya Crop Insurance Program (KCIP) which seeks to protect smallholder farmers (farmers with less than 5 acres) against the effects of adverse weather conditions on their crops (mainly wheat and maize). The government subsidises 50% of the premiums. This is an area yield index insurance product which compensates the insured farmers for a shortfall below the guaranteed yield in the unit area of insurance. The guaranteed yield is set at 80% of expected yield per unit area of insurance. It is currently being expanded to 10 counties in Kenya.
- Another index-based weather insurance product in the Kenyan market is Kilimo Salama, a partnership between Syngenta Foundation for Sustainable Agriculture, UAP Insurance, and telecoms operator Safaricom. It offers insurance policies to farmers with as little as one acre of planting area, to protect them from significant financial losses due to extreme droughts or rains affecting their harvests. Kilimo Salama currently insures over 70,000

farmers with a premium income of over USD 2.1 million. Farmers can register through microfinance institutions, cooperatives, or agricultural dealers, all of whom use a mobile phone application to enter the farmer's details into the system. The farmer then receives a confirmation SMS listing registration details and a policy number. Rain levels are monitored using satellite data and automated weather stations. In the event of excess rain or drought, funds are automatically paid into the farmer's M-PESA account (M for mobile, pesa is Swahili for money), a mobile phone-based money transfer, financing and microfinancing service.

### ***Are these existing agricultural index products regulated?***

These products are pilot products that have been given regulatory exemptions. However, we do have draft index insurance regulations which set minimum standards to be followed in product design and sales requirements. These standards guide the product approval process by the regulator.

### ***What is being done to scale up agriculture insurance in your country?***

Agriculture insurance is a risk management tool. The overall objective is to minimise risks emanating from drought-related disasters and build resilience of smallholder farmers for enhanced and sustainable food security.

The Government-supported programmes mentioned above are expected to be rolled out to all the counties in Kenya which have traditionally suffered the impact of adverse weather conditions.

### ***What can policymakers, supervisors and the industry do to ensure the success of an index insurance product?***

There is need for proper collaboration between policymakers, supervisors and the private sector for these programmes to be successful. The government needs to continue offering subsidies to smallholder farmers to support the growth of index insurance products and uptake. There is further need for increased public-private partnerships (PPP) in the provision of index-based insurance to smallholder farmers whose livelihoods depend on agriculture.

### ***Is mobile microinsurance used as a distribution channel in offering index insurance? What other distribution channels are used in Kenya?***

Mobile microinsurance is currently not being used to distribute index insurance in Kenya. The products are currently being distributed through microfinance institutions, seed companies and agricultural input suppliers, some NGOs and conventional insurance agents.

## **Interview**



**Michael Kofi Andoh,**  
Head of the Supervision  
Department, National  
Insurance Commission,  
Ghana

# **Michael Kofi Andoh, National Insurance Commission, Ghana**

Conducted by **Meredith Lytle**, Junior Membership Officer, Microinsurance Network

***Mr. Andoh, there's a lot of talk in the microinsurance community right now about the consequences of increasing severity and frequency of catastrophic events. Are you seeing the impact of climate change on agricultural production and smallholder farmers in Ghana?***

Yes, very much so. Climate change impact is particularly evident in the northern part of Ghana as recurrent floods and droughts take place which affect cereal and vegetable cropping, planting seasons, yield and the economic livelihood of people engaged in farming.



### ***With that in mind, what does the agricultural index insurance market look like in Ghana?***

We started working on agricultural index insurance a while back, around 2010, with assistance from GIZ. We actually rolled out weather index insurance products for cereals in the three northern regions of Ghana. I must say that the projects are not doing very well because of a number of issues, such as the price of premium which is very high for farmers. We have not been able to get the government to subsidise it and we also encounter problems at the level of marketing. We intended to sell at the meso level, with the distribution channels being rural and community banks, and the products bundled to credit. However, the fact that banks wanted to add the full cost of insurance to the interest made the loans expensive for the customers.

Another issue is basis risk, due to the fact that the density of weather stations in Northern Ghana is not that high. Since index-based insurance requires reliable information from weather stations, if the weather station is far from the farm, the data recorded might, at this site, be very different than the situation the farmer is actually experiencing, so there is the risk of farmers not getting a payout even if they have been impacted.

### ***What is the benefit of agricultural insurance to smallholder farmers?***

Around sixty percent of the population in Ghana depends on agriculture for their livelihoods. Climate change issues reduce their yields leading sometimes to zero yield, incurring very heavy losses, reducing the amount of investment in agriculture and impacting their overall economic situation.

### ***Are existing agricultural index products regulated?***

Yes, they are regulated. To give you a little background, some of the insurance companies attempted to offer agricultural insurance, but because their risk management was bad, they incurred a lot of losses and closed the programmes. When we decided to offer weather-based index insurance, we created a pool of insurance companies, the Ghana Agricultural Insurance Pool, with the pool actually acting as the insurer.

### ***What is being done to scale up agriculture insurance in your country?***

The Pool is trying to diversify its product base, trying to look at other products and livestock insurance as well, in addition to exploring a way to get subsidies from the government.

### ***What can policymakers, supervisors and the industry do to ensure the success of an index insurance product?***

Well, I must say that there has been an effective collaboration between all these entities. We now have an agricultural insurance steering committee, which includes regulators, the Ministry of Agriculture, agrometeorological authorities and other relevant stakeholders.

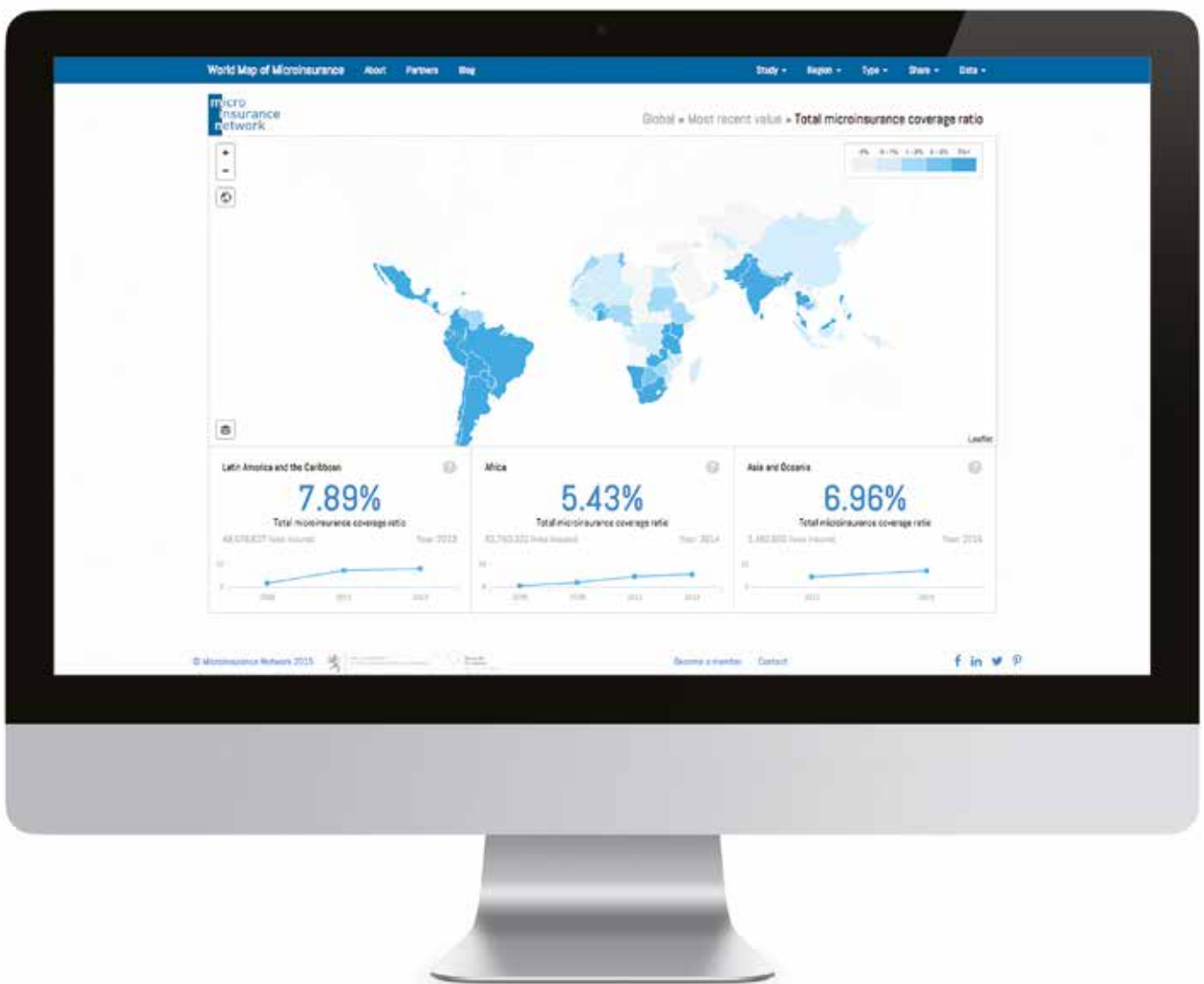
### ***Is mobile microinsurance used as a distribution channel in offering index insurance? What other distribution channels are used in Ghana?***

Mobile microinsurance is not being used at the moment, but this is an area that we need to explore. The agricultural insurance products are being distributed through rural and community banks, with an intention to bundle with credits and with the support of some NGOs, which operate in the area.

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