

Managing Climate Risk with Extreme Weather Insurance

The Inclusive Insurance Factsheet Series, developed by the GIZ Sector Programme “Global Initiative for Access to Insurance”, highlights how insurance as a tool contributes towards meeting the needs of vulnerable individuals, households and micro, small and medium-sized enterprises (MSMEs) in developing countries and emerging economies. It furthermore accentuates insurance’s role in helping achieve goals of the following development agendas: sustainable development and poverty alleviation, gender and women’s empowerment, agricultural development and food security, MSME development, and climate change mitigation and adaptation.

This factsheet describes how insurance can help households and MSMEs adapt to climate change and enhance their resilience to extreme weather events. It explains how parametric insurance works and the different types of extreme weather insurance, it presents examples on existing insurance solutions and recommends areas of intervention for international development cooperation.

1. Explaining Extreme Weather Risk Insurance

Climate change is a major contributor to natural hazards, while vulnerability levels rise and coping strategies are often insufficient. Climate change tends to increase the frequency and intensity of extreme weather events such as droughts, floods, hurricanes and storms, and therefore results in additional stress for societies and natural systems. Adaptive measures (e.g. building sea walls) are often not in place or simply cannot cope with the intensity of an extreme weather event, forcing the poor and vulnerable to resort to often damaging coping

strategies. These strategies, such as reducing food consumption or taking children out of school, borrowing from money lenders, selling livelihood assets or migrating to urban areas or another country, can trap people in poverty. The consequences of natural hazards turning into disasters are also severe for governments who have to reallocate funds in national budgets to crisis response, or for financial service providers (FSPs) whose asset base erodes when their borrowers cannot repay their loans.¹

How extreme weather risk insurance² works. Technically, extreme weather risk insurance is based on a contract, where the insurer makes a financial promise to the insured (can be an individual, MSME, an organization or a government entity) in case an extreme weather event occurs and results in losses and damages. The insurer receives a premium in return for the extreme weather payment promise. Traditionally, claims are based on an assessment of the damage to the insured asset. Extreme weather risk insurance by contrast is index-based. That means, when a weather parameter reaches a pre-defined threshold, an “index” triggers the payout according to a payout rate. Triggers could be parameters such as cumulative rainfall, temperature, windspeed or crop yields for an area. The payout could be triggered by the number of deficit mm below a certain threshold. The payout would be automatically and exclusively triggered by a parametric index value. While such index-based insurance settles quickly and on an objective basis, it can carry “basis risk”, which materializes when the payout triggered by the index value does not match the insured’s actual losses. However, insurers minimise basis risk thanks to very accurate high-resolution weather data and good contract designs for rare extreme weather events.

Three levels of insurance contracts exist, according to types of policyholders:

- 1. Macro level insurance: A governmental body is the policyholder.** Global reinsurers or transnational reinsurance pooling facilities usually provide the insurance coverage. The government can use the payouts to cover liquidity gaps or finance disaster relief programmes after a catastrophic event.
- 2. Meso-level insurance: An enterprise or financial service provider (FSP) is the policyholder.** Here an insurer insures the risk portfolio of the policyholder. The policyholder receives the payout after the extreme weather event to manage its financial risks associated with the consequences of the extreme weather event.
- 3. Micro level insurance: individual persons or small entrepreneurs are the policyholder or the designated beneficiary of a group insurance policy.** The insurance is often bundled with other services that agribusinesses, FSPs or input suppliers offer to low income households.



BOX 1: EXAMPLES

Macro level: Extreme weather insurance in the Caribbean and Central America. The Caribbean Catastrophe Risk Insurance Facility (CCRIF, Segregated Portfolio Company, SPC), is a macro-level extreme weather risk insurance facility that strengthens the resilience of 16 governments in the Caribbean and Central America. It offers earthquake, tropical cyclone and excess rainfall policies to the member states. CCRIF is an index based, parametric extreme weather insurance, meaning that payouts are dependent on a pre-established threshold, triggered by extreme events such as strong wind speed, ground shaking or excess rainfall. The transparent assessment of loss events leads to rapid payouts and helps the governments to finance their initial disaster response while maintaining other government functions and safeguarding development budgets. Since the inception of CCRIF in 2007, the facility has made 36 payouts to 13 member governments on their tropical cyclone, earthquake and excess rainfall policies, totaling 130.5 million USD.

Micro level: Small-scale farmers in Zambia. GIZ supports a micro-level index based extreme weather risk insurance in Zambia, where the agricultural company NWK AgriServices strengthens the resilience of small-scale farmers against extreme weather events with insurance. The company offers contracted farmers a loan for inputs (e.g. fertilizers, seeds) and the premium of an extreme weather insurance and funeral insurance at the beginning of the season. In exchange, the farmers agree to sell their crop to the agricultural company by the end of the season. NWK deducts the costs of the input and premium from crop sales revenues and possible insurance payouts (in the case of drought or heavy rainfall). The weather index, in this case satellite data estimates of rainfall for a given area, then "triggers" an automatic payout to the insured party if a predefined threshold is met. NWK has offered the insurance to farmers continuously since 2013. In 2015/2016, 52,000 out of 70,000 small-scale farmers contracted by the agricultural company opted to buy extreme weather insurance and even purchased additional coverage for funeral costs. In 2016, more than 23,000 small-scale farmers received payouts after a drought-stricken season.³ The insurance model has been successfully replicated by the cotton ginning company Alliance Gineries.

2. Benefits and good practices

Extreme weather risk insurance can protect households, MSMEs, FSPs and governments from deficient coping strategies by payouts that provide timely relief and mitigate the effects of extreme weather events. This in turn strengthens climate change resilience and fosters sustainable development.⁴ Furthermore, extreme weather risk insurance could incentivise risk-reducing behaviour, either directly because the insurer makes the coverage conditional on a series of risk reducing measures such as the housing fortification, or indirectly, when the price of the insurance reveals risk exposure levels and thereby generates risk awareness and better decision making on the allocation of assets. Households, MSMEs and governments therefore engage in better risk management

and reduce their risk exposure level, which allows insurers to charge lower insurance premiums. Finally, extreme weather risk insurance creates a safer environment where investments can be more easily undertaken and financed. This allows for investments in weather sensitive sectors (e.g. tourism and agriculture), which has positive effects on employment creation. Two fundamentally different objectives affecting the design and delivery of index products can be distinguished. Some products have the primary objective to help poor people protect their livelihoods and assets and are, therefore, an alternative to traditional relief programmes. Other products help businesses transfer and manage their risks, and thereby “promote” these businesses. The fundamental purposes of these two types of insurance are very different, respectively ensuring both *protection* and *promotion* objectives.⁵

BOX 2: KEY BENEFITS OF THE INSURANCE

Extreme weather risk insurance...

→ ...makes households and MSMEs more resilient (*protection insurance*)

Studies demonstrated that farmer households tend to become more resilient because they tend to manage risks more consciously. In addition, the quick and reliable payouts after a catastrophic event help the households to avoid disastrous coping strategies whereby they resort to money-lenders for quick cash loans, or even sell important assets, such as the milk cow, in order to be able to pay school fees or other immediate necessities. In **Kenya**, insurance positively affected pastoral farm households following a shock: asset-rich households were less likely to engage in distress sales of livestock to smooth consumption, and asset-poor households were less likely to destabilise consumption by reducing meals.⁶

→ ...makes households safer through empowering disaster safety nets (*protection insurance*)

Governments and humanitarian aid organisations try to provide emergency assistance to affected households. However, this aid often does not reach the right beneficiaries in time or in the correct form, and tends to be expensive for taxpayers. Subsidised extreme weather insurance can be more effective and efficient in reaching beneficiaries with reliable and predictable support in time. Furthermore, targeted premium subsidisation appears to offer more cost-effective poverty reduction than need-based direct transfers.⁷ An analysis of 38 index insurance schemes finds that for the poor and vulnerable fully subsidised insurance, like early recovery vouchers, would be an effective and efficient safety net to mitigate the effects of catastrophes effectively.⁸

→ ...makes farmers more productive as it encourages higher input use (*promotion insurance*)

Evidence from multiple empirical studies reveals that insurance increases household consumption and incentivises farmers to take greater risks, spend more on their farms, and realize the benefits of higher yields or output. For example, in **Ghana**, insurance led farmers to increase agricultural expenditures, cultivate nearly an acre more land, spend nearly 14 percent more on land preparation and spend more on modern inputs (mostly fertilizers) by nearly 24 percent.⁹ In **Andhra Pradesh, India**, insurance caused farmers to invest in higher-return cash crops.¹⁰ In **Tamil Nadu, India**, insured farmers shifted to high-yielding rice varieties over lower-yielding, drought-tolerant ones.¹¹ In **Bangladesh**, index-insured farmers spent roughly 16 percent more on agricultural inputs.¹²

3. Challenges related to Scaling Up Extreme Weather Risk Insurance

Manifold challenges at all levels. There are various hurdles to reaching large numbers of vulnerable and poor individuals, and of MSMEs, with extreme weather risk insurance. These include the target group’s lack of awareness regarding insurance products, cash constraints affecting regular premium payment, missing or non-reliable weather data, and the lack of access to insurance products generally. Key drivers of sustainable and scalable extreme weather insurance business models are illustrated in Figure 1. These drivers differ according to the public or private nature of the delivery model. In the case of the **private delivery model**, sustainable business models generate clear value for the intermediary and the insured. The **public delivery model** entails a public institution that integrates extreme weather risk insurance into its disaster risk programmes and social safety nets, which ensure proper contingency plans are in place to channel the right kind of resources to the affected households in time.



FIGURE 1: Key success factors for scaling up sustainable extreme weather risk insurance

	Design sustainable insurance models	Digitalize	Use remote sensing to	Finance the premium
PRIVATE DELIVERY MODELS	<ul style="list-style-type: none"> • Credit linked • Bundle with Input Sale • Agribusiness Contract • Farming Linked 	<ul style="list-style-type: none"> • Risk assessment • Claim notification and settlements • Premium Payments 	<ul style="list-style-type: none"> • Estimate weather parameters (rainfall, wind, temperature) 	per Credit
PUBLIC DELIVERY MODELS	<ul style="list-style-type: none"> • Input Subsidy Program • Safety Nets • Disaster Risk Programs 	<ul style="list-style-type: none"> • Mobile Weather alerts • Awareness Raising • E-vouchers 	<ul style="list-style-type: none"> • Detected natural hazards and damages 	per Smart Premium Subsidies

ENABLING ENVIROMENT ENTAILS

- ✓ FINANCIAL LITERACY
- ✓ ACCESS TO HISTORICAL RISK DATA
- ✓ TECHNICAL ASSISTANCE FOR LOCAL INSURERS
- ✓ ACCESS TO REINSURANCE- GLOBAL RISK TRANSFER FOR NATIONAL INSURERS
- ✓ ENABLING SUPERVISORS

4. Intervention areas for international development cooperation

To address the main challenges of extreme weather risk insurance worldwide, international development agencies can support and empower national partners in the following intervention areas:

- » **Sustainable business models:** Advisory services to the insurance industry on developing innovative and demand-oriented insurance business models that add value to people's lives and MSME businesses. This way they help to build the capacity of insurers so that they can work with new technologies and deliver sustainable business models to make insurance products for low-income households and MSMEs easier to access and more affordable. They also build the capacity of intermediaries involved in the distribution of agricultural insurance, such as agribusinesses, financial institutions or input suppliers.
- » **Consumer protection:** Support for the planning and implementation of educational campaigns. The goal is to enable households and businesses to understand the benefits and obligations that arise from concluding an insurance contract in order to strengthen their trust in insurance products and providers.
- » **Public goods – data, technology and insurance literacy:** The provision of advisory services on how to cost-effectively generate and manage the public goods that innovative data driven weather insurance requires. This includes: quality data generation and user-friendly and affordable access to the data; pilot testing of new technologies and capacity building to introduce and apply modern data collection and analysis tools; advisory services to governments and the insurance industry on the design and implementation of awareness and literacy campaigns.
- » **Policy and regulatory framework:** Advisory services to national partners in building a conducive institutional framework, i.e. design of policies and regulations that support a sustainable market development, the use of new technologies (e.g. digital) or low-cost distribution models. This also encompasses the promotion of public-private partnerships in the sector. This includes advice on the role of government and the effective use of public funds, and advice to insurance supervisors on how to adapt insurance regulations that safeguard the stability of the financial sector, motivate providers and protect consumers.



Endnotes

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- 2 The term **“extreme weather risk insurance”** encapsulates insurance contracts that transfer the extreme weather risk to an insurer and thereby protect the policyholder against the financial effects of extreme weather events. BMZ and Munich Climate Insurance Initiative use the term **“climate risk insurance”** (CRI) synonymously for extreme weather risk insurance and introduced CRI to the international debate on climate change. This term and concept regained momentum with the adoption of the Paris Agreement in 2015, as well as the establishment of the InsuResilience Global Partnership by the G7 countries during the same year.
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Registered offices
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Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 6196 79-0
F +49 6196 79-11 15

E inclusive.insurance@giz.de
I www.giz.de

Programme:
Sector Programme „Global Initiative for Access to Insurance“

Responsible/contact:
Ulrich Hess
E ulrich.hess@giz.de
Saskia Kuhn
E saskia.kuhn@giz.de

Authors:
Ulrich Hess and Robert Fischle

Design/layout etc.:
Jeanette Geppert, pixelundpunkt kommunikation, Frankfurt am Main

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