Anticipation Hub

WORKING PAPER

Leveraging insurance for anticipatory action: insights and emerging lessons

Dr Nikolas Scherer and Dr Stella Shumba
June 2025

Anticipation Hub working paper #2.

Please cite as: Scherer, N. and Shumba, S. *Leveraging Insurance for Anticipatory Action: Insights and Emerging Lessons.* Berlin: Anticipation Hub, 2025

The authors would like to thank the following case contributors for their valuable time and inputs: Luzandera Camargo, Christopher McDonald, Shirin Merola, Pietro Magnoni, Aholotu Palu, Richard Poulter, Viktoria Seifert, Akata Taito, Michael Mbaka, Wesley Chitsike and Gloria Womitso. Special thanks go to the Sectoral Community on Anticipatory Action and Risk Financing for initiating the development of this paper. We are also grateful to Emily Montier for her thoughtful review and to Sinja Buri for her valuable contributions. Our sincere thanks extend to Rachael Hansen and Tim Woods for their support in shaping the final product.

Table of contents

Acronyms and abbreviations

AI	artificial intelligence
ARC	African Risk Capacity
CERF	Central Emergency Response Fund
DREF	Disaster Response Emergency Fund
DRIVE	De-risking, Inclusion and Value Enhancement of Pastoral Economies
IASC	Interagency Standing Committee
ICRC	International Committee of the Red Cross
IFRC	International Federation of Red Cross and Red Crescent Societies
INSIVUMEH	Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute for Climate and Society
NGO	non-governmental organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PCRIC	Pacific Catastrophe Risk Insurance Company
PyCPT	Python Interface to the Climate Predictability Tool
UK	United Kingdom
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDRR	United Nations Office for Disaster Risk Reduction
US	United States
WFP	World Food Programme

1. Executive summary

Strengthening anticipatory action through disaster risk financing

Extreme weather and climate events such as storms, heat waves, droughts, floods and wildfires are becoming more frequent and intense, as underscored by the *Sixth Assessment Report* of the Intergovernmental Panel on Climate Change (**IPCC 2023**). The climate crisis is placing increasing pressure on lives and livelihoods, particularly in fragile and conflict-affected settings, as highlighted in the International Committee of the Red Cross's report *When Rain Turns to Dust* (**ICRC 2020**). These extreme events disproportionately affect certain groups, deepening their vulnerability to future hazards and long-term impacts. Moreover, as extreme events become more frequent and intense, recovery periods grow shorter, leaving communities with less time to rebuild before the next disaster strikes.

In response to this rising tide of extreme events, technological progress has expanded our ability to predict, with increasing accuracy, when and where extreme weather events will occur. This data provides an opportunity to act before the events turn into a disaster, saving lives and livelihoods.

Anticipatory action is an approach that makes use of the time between a forecast hazard, such as a flood, drought or tropical storm, and its actual impact. The approach systematically links forecasts to action plans that are triggered when certain thresholds are met (e.g., prediction of a certain amount of rainfall, or a certain windspeed). Anticipatory action empowers humanitarian agencies, disaster risk management agencies, local communities and people at risk to act ahead of a forecast hazard, with the goal of reducing the hazard's impact and alleviating the humanitarian burden associated with a delayed response.

Definition of anticipatory action

To build momentum and foster a shared understanding, the Grand Bargain Caucus on Scaling Up Anticipatory Action recently defined anticipatory action as "acting ahead of a predicted hazardous event to prevent or reduce impacts on lives, livelihoods, and humanitarian needs before they fully unfold" (**IASC 2024**). This established definition provides a solid foundation for policy-makers and practitioners.

In practice, anticipatory action takes different forms depending on the mandate of the organizations involved, the context in which people live, the type of hazard they are facing, and the available forecasts for that hazard. However, there are common parameters to all forms:

- The objective is to reduce the potential impacts of forecastable hazard(s).
- Actions are designed based on pre-agreed triggers or predictive analyses of when and where a hazard will occur.
- Pre-planned actions, supported by pre-arranged finance, are implemented before a hazard's impact, or before its most acute impacts are felt.

The increasing relevance and potential of anticipatory action

Anticipatory action has been pioneered in the humanitarian sector by the International Federation of Red Cross and Red Crescent Societies (IFRC), United Nations (UN) agencies and non-governmental organizations (NGOs). It can be, and has been, implemented under government leadership at the national, subnational (regional/district) and local (community/municipality) levels. It has gained significant momentum (see, for instance, **Anticipation Hub 2023**; **Anticipation Hub 2024**; **Anticipation Hub 2025**) and is recognized by states as a key way to minimize climate-related impacts (see, for instance, **International Conference of the Red Cross and Red Crescent 2024**).

Numerous studies underscore the various benefits of anticipatory action. Impact studies available on the Anticipation Hub's evidence database[1] show, inter alia, that it is much more cost-effective than traditional response measures (i.e., acting after a disaster strikes), reduces negative coping strategies (e.g., taking on more household debt or selling assets) and protects development gains and livelihoods (e.g., through safeguarding long-term resilience-building projects or productive investments, which could enhance future income-generating capacity and long-term resilience).

1 See: tinyurl.com/3wcn6tv3

The role of disaster risk financing in anticipatory action

Despite its proven benefits, anticipatory action remains chronically underfunded, undermining its ability to reach its full potential. Just 0.8 per cent of overall crisis financing goes towards anticipatory action (**Plitcha and Poole 2024**). This funding gap represents a missed opportunity to transition from reactive to proactive interventions. Moreover, to date, anticipatory action has primarily been financed by a limited number of donors – especially Germany, the United Kingdom (UK) and the European Union – and through humanitarian-contingency-financing mechanisms including:

- the **Disaster Response Emergency Fund (DREF)**, which is managed by the IFRC and provides rapid, flexible funding to National Red Cross and Red Crescent Societies, including for anticipatory action
- the **Central Emergency Response Fund (CERF)**, which is administered by the UN Office for the Coordination of Humanitarian Affairs (OCHA) and includes a window to finance anticipatory action for UN agencies
- the **Start Fund** and the **Start Ready** fund, which are mechanisms that enable NGOs to access funds to implement anticipatory action based on early warnings.

While these mechanisms have demonstrated the potential of anticipatory action, the reliance on humanitarian contingency funding inhibits its scalability and sustainability. Furthermore, the financial capacity of these global pooled funds remains limited and represents only a small portion of global humanitarian needs. As an example, in 2024, the CERF – the largest humanitarian contingency fund supporting anticipatory action – committed 133.8 million US dollars[2] towards implementing anticipatory action (**Anticipation Hub 2025**).

To manage the risk of fund depletion, the IFRC's DREF caps disbursements for anticipatory action at 500,000 Swiss francs per country framework. Recognizing the strain posed by multiple or largescale crises, Start Network's Start Fund operates as a rapid pooled crisis fund that is complemented by Start Ready, an insurance-based mechanism that uses pre-agreed triggers, risk pooling and reinsurance to ensure predictable funding during periods of high demand.

These limitations highlight the urgent need to diversify and expand financing instruments to ensure the long-term viability and scalability of anticipatory action.

Expanding financing options for anticipatory action

Anticipatory action can be, and has been, financed through other mechanisms. Several disaster risk financing tools, such as insurance, catastrophe (or 'cat') bonds and crisis modifiers, use data-informed triggers similar to those used in anticipatory action, making them well suited to support it (see Box 1). Taken together, these tools could form the financial backbone of anticipatory action and support its transition to a large-scale, systemic approach for reducing disaster risks.

Caveats and demands on disaster risk financing tools

While these tools offer valuable financial protection, they were not originally designed for anticipatory action. First of all, anticipatory action seeks to prevent or minimize the impacts of predicted hazards, with activities focused on preventive or pre-emptive measures. Disaster risk financing tools, by contrast, traditionally focus on financing post-disaster response, recovery and reconstruction efforts. Moreover, anticipatory action is particularly suitable for recurrent or predictable hazards that occur with high frequency (e.g., more than once in five years). In contrast, tools such as insurance and cat bonds are only cost-effective for less frequent events.

In addition, while anticipatory action holds immense promise to save lives and livelihoods, it places specific demands on these tools:

- **Forecast-based payouts.** Financing mechanisms must be designed to disburse funds based on forecasts rather than observed impacts. This requires reliable forecasting systems.
- **Rapid availability of funds.** Anticipatory action depends on quick access to financing. Funds must be immediately accessible when triggers are met to enable timely action.
- **Targeting and delivery capacity.** Ensuring that funds reach the right people at the right time is critical. This requires effective delivery channels, adequate absorptive capacity, and strong community engagement.

2 This is the combined amount for OCHA-coordinated active frameworks and frameworks under development.

Box 1. A guide to tools for disaster risk financing

Insurance is a risk transfer mechanism that spreads financial risk across policyholders. It can be offered at the macro (sovereign), meso (institutions, groups) or micro (individual) levels. When a disaster (e.g., flood, drought) meets pre-agreed conditions, a payout is triggered. Insurance product types include:

- indemnity, in which payouts are based on actual, assessed losses
- parametric, in which payouts are based on predefined, measurable event parameters (e.g., rainfall below a specific threshold).

Catastrophe bonds are an alternative risk transfer mechanism that helps governments, insurers and organizations manage the financial risks of disasters. They work like insurance but are funded by investors; that is, the capital markets. An entity (e.g., a government or organization) issues a catastrophe bond to investors. If a disaster occurs and meets certain pre-agreed conditions (e.g., a specific level of damage or intensity), the bond's funds are used to cover losses instead of being repaid to investors. If no disaster happens, investors get their money back with interest.

Crisis modifiers are a flexible funding tool that allows (development) programmes to quickly shift or add funds when a crisis (a predefined condition) occurs. Instead of waiting for new funding, crisis modifiers enable projects to respond early to shocks such as droughts or floods, helping to protect progress and reduce humanitarian needs. For example, a long-term agriculture programme could use a crisis modifier to release extra funds for drought-resistant seeds when a drought is forecast, thus preventing food shortages.

Purpose, target group and structure of this working paper

Despite these challenges, anticipatory action has been successfully linked to more data-driven disaster-risk-financing tools, particularly insurance. This paper examines this integration, exploring lessons learned and identifying opportunities for improvement. The key question guiding this paper is: how have insurance instruments been used to fuel anticipatory action? Using a comparative case study methodology, it aims to:

- examine how insurance instruments have been adapted to incorporate anticipatory action principles
- identify and analyse key challenges, including technical, financial and operational hurdles
- illustrate solutions that have been developed
- highlight persisting gaps and propose pathways to refine and scale up catastrophe-risk-insurance instruments for broader anticipatory action applications.

By exploring common challenges and potential solutions, this paper seeks to foster a more evidence-based, systematic discussion on how to strengthen the link between catastrophe risk insurance and anticipatory action. It is intended for technical focal points and practitioners working in these fields, particularly those working to align financial instruments with proactive strategies for disaster risk management.

The paper is structured as follows: Section 2 uses a common methodological framework to present six case studies that explore the integration of macro-, meso- and micro-level insurance schemes with anticipatory action, concluding with a summary of the key insights. Section 3 identifies cross-cutting challenges emerging from the case studies and outlines potential pathways for strengthening the use of insurance in anticipatory action.

2. Experiences of adapting insurance instruments to fuel anticipatory action

This section examines case studies that showcase examples of insurance instruments linked to anticipatory action. These instruments are offered at three levels:

- the **macro level,** focusing on regional risk pools
- the **meso level,** targeting cooperatives and local governments
- the **micro level,** addressing individual households and other vulnerable groups.

The case studies are based on stakeholder contributions from various organizations, capturing insights from their experiences. To ensure consistency and depth of analysis, four guiding questions were posed to stakeholders and used to structure each case study:

1. How does the instrument work?
2. What were the main challenges during design, development or implementation?
3. How have the challenges been addressed?
4. What lessons were learned?

Although only limited case studies are available, the highlighted examples offer valuable initial insights into the interplay between catastrophe-risk-insurance instruments and anticipatory action across different levels, providing practical guidance for scaling and sustainability.

2.1 Macro-level insurance

Macro or sovereign insurance is a financial instrument designed to provide countries with rapid payouts in the aftermath of catastrophic events, enabling governments to manage large-scale risks effectively. Regional risk pools utilize this approach by allowing countries within a specific region to share financial risks through pooled resources. These mechanisms provide member countries with rapid access to liquidity for disaster response, primarily through parametric insurance, while benefitting from reduced costs and shared risk.

The Caribbean Catastrophe Risk Insurance Facility, launched in 2007, was the first regional risk pool and set a precedent for subsequent initiatives. Other risk pools include the African Risk Capacity (ARC), the Pacific Catastrophe Risk Insurance Company (PCRIC) and the Southeast Asia Disaster Risk Insurance Facility, which collectively demonstrate the scalability and adaptability of this model.

This section focuses on ARC and PCRIC as case studies to explore the integration of anticipatory action and disaster risk financing. These examples demonstrate how regional risk pools are effectively addressing both pre-disaster and post-disaster needs, thereby enhancing resilience, preparedness and adaptive capacity in vulnerable regions.

Case study 1: African Risk Capacity

ARC, established in 2012 as a specialized agency of the African Union, provides sovereign insurance to help African governments better manage the financial burden of weather-related disasters. In 2014, ARC launched its financial affiliate, ARC Ltd, to underwrite insurance policies. Together, these entities form the ARC Group, which aims to strengthen risk preparedness, improve disaster response and promote financial resilience across the continent. Traditionally, ARC's drought insurance has focused on post-disaster response, with payouts triggered only after a drought's impacts materialize, which is often too late for early interventions.

Recognizing the value of anticipatory action, ARC partnered with OCHA to develop a model that releases funds earlier, based on forecast drought conditions. With financial backing from KfW (the German Development Bank), ARC piloted its anticipatory insurance product in Malawi and Zambia during the 2023/24 agricultural season. The donor-funded pilot enabled governments to test the model without premium costs, assessing its feasibility for scaling up anticipatory risk financing.

How the instrument works

ARC's anticipatory insurance is designed to release funds early in the growing season, complementing traditional drought insurance, which provides support later in the season. The two products work in tandem to strengthen food security and rural livelihoods, ensuring financial support at different crisis stages. Both insurance products rely on the Water Requirement Satisfaction Index, a model that assesses whether crops receive adequate moisture during their critical early-growth phase. If rainfall falls below predefined thresholds, the model projects a high probability of yield failure and triggers an insurance payout.

Before purchasing insurance, governments must develop a pre-agreed contingency plan outlining how payouts will be used. Once a payout is triggered, governments must submit a Final Implementation Plan. This specifies the activities, recipients and implementers (that are only outlined in the contingency plan) based on the actual payout.

Governments act as policyholders and coordinate payouts in collaboration with humanitarian agencies. Typical interventions include:

- the distribution of drought-tolerant seeds
- scaling up agricultural-input support (e.g., fertilizers, irrigation assistance)
- providing cash transfers or food aid to vulnerable households.

ARC's anticipatory insurance does not require countries to develop a new contingency plan. Instead, governments can specify anticipatory actions as part of the submission of the Final Implementation Plan.

In 2023, Malawi and Zambia participated in the anticipatory insurance pilot. No anticipatory payout was triggered, as sufficient rainfall was received during the sowing window. However, as the season progressed and drought conditions worsened, both countries received payouts under their traditional sovereign drought-insurance coverage in 2024.

For the 2024/25 season, Malawi's anticipatory insurance triggered a payout, marking the first activation of this mechanism. The payout for the Lower Shire Region was 288,066 US dollars, while the payout for the Southern Region was 22,971 US dollars. This brings the total payout to 311,037 US dollars, with a total premium paid of 500,000 US dollars. Due to technical and bureaucratic delays (see opposite), the funds were disbursed late.

Challenges and how they were addressed

The development and implementation of ARC's anticipatory insurance encountered a range of political, technical and operational hurdles, many of which continue to influence the feasibility of scaling up the model. While the 2024/25 season marked a significant milestone, with Malawi's first-ever anticipatory payout, delays in the underlying risk model and administrative processes meant that disbursements occurred later than intended. As a result, the product faced practical implementation challenges that limited its ability to fully achieve its anticipatory objectives during the initial pilot year.

Government scepticism emerged as a key challenge during the early stages of product development. Some policy-makers were hesitant to pay for insurance based on forecasts rather than observed drought impacts. To overcome this, the pilot was fully subsidized by donors, allowing governments to test anticipatory insurance without financial risk. While this approach facilitated initial engagement, it also raised concerns about long-term sustainability and whether governments would eventually integrate premium payments into their national budgets. Encouragingly, there are signs of increasing government commitment. Notably, Zambia has increased its budget allocation for both traditional drought insurance and anticipatory insurance, even in the absence of an anticipatory payout. This demonstrates growing confidence in the product and a willingness to co-finance future premiums, in line with ARC's advocacy efforts.

Technical and operational delays also posed significant challenges during implementation. A key issue was the time lag in processing satellite data, which affected the timely validation of triggers. As a result, the window for anticipatory action was shortened, limiting the government's ability to intervene early. On the operational side, the approval of the Final Implementation Plan – a prerequisite for disbursing payouts – proved time-consuming. This process requires detailed decisions on fund allocation, implementing partners, procurement modalities and inter-ministerial coordination, all of which contributed to delays.

To address these issues, ARC is working to improve its data infrastructure and risk-modelling capabilities by incorporating alternative datasets and analytics powered by artificial intelligence (AI) to accelerate trigger validation. Additionally, it is implementing capacity-building initiatives for government officials, focusing on simplifying approval processes and improving interagency coordination. Discussions are also under way to explore structural reforms to the process of developing Final Implementation Plans, including the introduction of pre-authorizations and adjusted approval levels, to reduce delays and enhance operational readiness.

Pathways for improvement

ARC's anticipatory insurance represents an important innovation and offers valuable lessons for improvement. One area lies in streamlining the approval process for Final Implementation Plans. ARC is actively working on solutions such as pre-authorizations and decentralizing approval levels, with promising progress already under way.

There is growing momentum for broader uptake beyond southern Africa. While donor support has been instrumental in launching the pilot, encouraging steps, such as Zambia increasing its national budget allocation, point toward greater government ownership and long-term integration into strategies for disaster risk financing.

Simultaneously, strengthening confidence among humanitarian actors presents an opportunity for closer collaboration. Ongoing dialogue, backed by strong evidence of cost-effectiveness and timely impact, can help bridge the gap between grant-based preferences and insurance-backed anticipatory action. With continued learning, refinement and cross-sector engagement, ARC's anticipatory insurance model is well positioned to scale up and become a core element of proactive disaster risk management.

Case study 2: Pacific Catastrophe Risk Insurance Company

PCRIC was established in 2016 to help Pacific Island countries manage the fiscal impacts of natural hazards. A public–private company, it provides parametric insurance coverage for tropical cyclones, earthquakes, excessive rainfall, tsunamis and droughts, with payouts made within two weeks after an event based on predefined hazard thresholds. Payouts are channelled through a country's ministry of finance. Countries are largely free to determine how these funds are used.

While PCRIC was initially designed to fund post-disaster activities, since 2022 it has been working on a new drought-insurance product that makes a partial payout before a drought's impacts fully unfold. The insurance product uses a dual-trigger mechanism and is expected to be finalized in 2025. The design has already been completed for Tonga, with finalization planned for the Federated States of Micronesia, Kiribati, the Marshall Islands and Nauru during 2025.

How the instrument works

PCRIC's dual-trigger drought-insurance product is designed to activate at two critical stages, ensuring timely financial support for both anticipatory action and post-disaster response.

The first trigger, known as the 'early action trigger', is activated when drought conditions reach the 'warning' level. At this stage, 10 per cent of the insured value is released, allowing governments to implement anticipatory actions such as upgrading water infrastructure, deploying desalination units, improving rainwater harvesting systems, or running community awareness campaigns on water conservation. These interventions help reduce the long-term humanitarian and economic impacts of the predicted drought by addressing risks before they fully unfold.

The second trigger, referred to as the 'rapid response trigger', is activated once drought conditions reach the 'declaration' level. This releases the remaining 90 per cent of the insured value, enabling governments to fund emergency relief efforts such as food and water distribution, infrastructure repairs, and direct financial support for affected communities.

Governments purchase the policy through their ministries of finance and are responsible for allocating funds through existing disaster-risk-management channels. The structured payout system ensures that both anticipatory actions and response measures are adequately financed.

Challenges and how they were addressed

One major technical hurdle was determining the appropriate threshold for the early action trigger, from both a technical and financial perspective. If set too low, payouts could occur too frequently, driving up premiums and compromising long-term affordability. This is particularly challenging for Pacific Island countries with limited fiscal space. To address this, PCRIC conducted extensive consultations with national meteorological services, disaster risk management offices and ministries of finance. These discussions ensured that trigger thresholds were aligned with country-specific risk profiles, existing early warning systems, and financial capacities. To further improve affordability, PCRIC introduced a flexible allocation mechanism that allows countries to designate the share of coverage allocated to early action versus rapid response. A commonly recommended split is 10 per cent for early action and 90 per cent for post-disaster response. This structure allows for the implementation of some anticipatory actions without significantly inflating the overall premium costs.

In addition to design-related issues, structural and institutional constraints were identified as implementation challenges. Governments in many Pacific Island countries face limitations related to geographic isolation, small populations and constrained administrative capacity (e.g., a shortage of trained personnel), which may delay or hinder the implementation of anticipatory action. In response, PCRIC designed its payout structure to maximize flexibility, a feature that countries consistently identified as essential for enabling context-specific and needs-driven interventions. As such, payouts for both early action and rapid response are not tied to the existence or prior approval of action plans. Nonetheless, many national drought-management plans do outline recommended actions for different stages of a drought. To further support implementation, PCRIC and WTW, the insurer, worked with governments to identify actionable measures and delivery channels that could ensure that timely support reaches vulnerable communities.

Pathways for improvement

As the product moves toward pilot implementation and finalization in selected Pacific Island countries, an important consideration is how often the early action trigger may be activated, as this could influence premium costs over time. At the same time, this presents a valuable opportunity to assess the benefits of combining early action and rapid response within a single insurance policy. If the potential advantages, such as improved preparedness, reduced losses and faster response, outweigh the additional costs, the two-tiered structure could prove to be a powerful, integrated financing tool. Alternatively, insurance could be reserved for the rapid response trigger, while a separate fund is established to finance early action payouts.

2.2 Meso-level insurance

Meso-level insurance operates at an intermediary level, bridging the gap between macro-level insurance (which serves governments) and micro-level insurance (which targets individuals). These instruments are designed to provide financial protection to groups such as NGOs, cooperatives, farmer associations or communities, enabling them to manage risks collectively and implement timely interventions during climate-related events.

This section focuses on the anticipatory insurance products developed by the United Nations Capital Development Fund (UNCDF) in Fiji, the World Food Programme (WFP) in Guatemala, and Tearfund's multi-country initiative. These case studies demonstrate how international actors have sought to develop a more localized approach to enhancing resilience for vulnerable populations.

Case study 3: UNCDF's anticipatory insurance scheme

As previously noted, Pacific Island countries are highly exposed to climate-related disasters, including tropical cyclones, floods and drought. While disaster response mechanisms exist, pre-arranged financing solutions at the community level remain limited, leaving cooperatives and local groups without the resources to take anticipatory action or recover efficiently.

To address this gap, the Pacific Insurance and Climate Adaptation Programme, implemented by UNCDF in partnership with the United Nations Development Programme and the United Nations University – Institute for Environment and Human Security, has been developing several tools for climate-related disaster risk financing in the region. Building on these efforts, UNCDF and the United Nations Office for Disaster Risk Reduction (UNDRR) jointly launched a meso-level anticipatory insurance scheme in Fiji. The initiative was designed based on feedback from vulnerable communities. It aims to provide timely financial support to cooperatives and associations, enabling them to act before and after disasters, reducing economic losses and enhancing community resilience.

How the instrument works

The UNCDF anticipatory insurance scheme provides financial coverage to cooperatives and associations when a tropical cyclone is predicted to make landfall. By directly linking payouts to forecasts, the scheme ensures policyholders receive pre-arranged funding to mitigate its impact.

The instrument operates through a dual payout structure:

1. Anticipatory action payout

- This is triggere 48 to 24 hours before the predicted landfall, based on windspeed forecasts from the Global Forecast System and the distance to the cyclone's eye.
- It uses a three-tiered payout system (10, 15 or 20 per cent of the total insured sum) depending on the forecast severity.
- It uses the existing governance structures of cooperatives and associations, which should use the funds to implement the activities pre-identified by their members, such as:
  - purchasing hardware to secure property and livestock sheds
  - purchasing emergency supplies (e.g., fuel, food, hygiene kits, clean water)
  - hiring excavators to clear drainage systems
  - transportation to evacuation centres.
- If the payment system becomes non-functional during disasters, contingency arrangements with the cooperatives allow them to use their own funds to initiate community preparedness, once a payout has been activated.

2. Post-event payout

- This is activated after the event, based on actual windspeed data from the Joint Typhoon Warning Centre.
- It disburses up to 80 per cent of the insured sum, adjusted for any anticipatory finance already released.
- If the anticipatory payout was equal to or greater than the post-event payout, no additional disbursement occurs.
- There is a 'no regrets' approach; hence, if there is a diversion in the track of the cyclone, communities will not be expected to return the anticipatory payout to the insurance company.

The total maximum insured value for the pilot was 50,000 Fijian dollars (approximately 25,000 US dollars), with premiums capped at 10 per cent of the insured sum.

Challenges and how they were addressed

The development of the UNCDF anticipatory insurance scheme faced multiple challenges, including financial constraints, low awareness, and technical and logistical hurdles.

A key issue was the affordability of premiums. Even with premiums capped at 10 per cent of the insured amount, many cooperatives and associations were unable to afford coverage. To remove this barrier, UNDRR fully subsidized the premiums during the pilot phase. This allowed cooperatives to participate without financial pressure, while demonstrating the feasibility of anticipatory insurance at the meso level. However, affordability remains a long-term concern, particularly in the absence of continued donor support.

Another significant challenge was limited awareness and understanding of anticipatory insurance. Many cooperatives, particularly those in remote areas, were unfamiliar with the concept of insurance, let alone one based on forecasts rather than observed impacts. This scepticism led to hesitancy in participation, requiring substantial educational efforts to build trust and secure interest. To address this, UNCDF engaged in extensive stakeholder consultations with cooperatives, focusing on community-driven design. Focus group discussions helped identify actions that could be taken by cooperatives and associations. By incorporating community feedback, the scheme gained greater acceptance among cooperative members. To further increase transparency, instrument designers opted for a simple trigger model and clear thresholds.

A technical challenge was identifying the right threshold for the trigger(s). If the threshold was set too low, payouts would have become too frequent, inflating premiums. If the threshold was set too high, it would reduce the effectiveness of any anticipatory actions. To manage this, instrument designers opted for a simple trigger model with clearly defined thresholds, balancing risk with affordability and ensuring usability.

Finally, capacity constraints among cooperatives posed challenges to implementing an envisioned anticipatory payout. Some cooperatives lacked the governance structures or logistical capabilities needed to manage payouts efficiently, making it difficult to implement the outlined actions. The narrow 48-to-24-hour window before an event, in which the disbursed funds had to be used, required swift, well-coordinated action – something that can be challenging for cooperatives with limited capacity or training. To mitigate this, the scheme prioritized the participation of cooperatives with strong governance structures. These cooperatives had established financial-delivery systems in place, enabling them to distribute funds rapidly when payouts were triggered.

Pathways for improvement

Financing remains a critical issue. The pilot phase relied on donor subsidies (via UNDRR), but this is not a viable approach in the long run. Encouraging policyholders to contribute at least partially to premiums will be essential to ensure sustainability. Overcoming scepticism about insurance will be crucial for growth.

Refining the sensitivity of the triggers continues to be a challenge. Overly sensitive triggers can lead to frequent payouts, increasing premium costs. Restrictive triggers, on the other hand, may delay payouts, reducing the effectiveness of the anticipatory actions. Balancing these factors is critical to maintaining trust and affordability.

Finally, the short time frame for anticipatory actions remains a structural constraint. Cooperatives with limited logistical capacity may struggle to mobilize resources within the 48-to-24-hour window. Investments in capacity building will be essential to strengthen disaster preparedness and improve implementation speed.

Case study 4: WFP's forecast-based index insurance scheme

Guatemala's Dry Corridor[3] is one of the most climate-vulnerable regions in Central America, where smallholder farmers and indigenous communities frequently experience droughts, erratic rainfall and extreme weather events. These hazards disrupt livelihoods, undermine food security and strain local disaster-response capacities.

To address these challenges, WFP in Guatemala implements a disaster risk financing strategy to support smallholder producers, local institutions and partners in adapting to and better preparing for the impacts of extreme weather events on livelihoods and the environment. The key activities that have been implemented include insurance to enhance financial protection, anticipatory action to enable proactive responses to climate threats, and last-mile climate information services to improve access to critical weather data.

Building on this success, WFP is developing a forecast-based index insurance scheme that will serve as a financing mechanism to expand the anticipatory action framework that has already been piloted in the Chiquimula Department. While the International Research Institute for Climate and Society (IRI) has been supporting WFP and the National Institute for Seismology, Vulcanology, Meteorology and Hydrology of Guatemala (INSIVUMEH) with forecasting models, technical service providers specialized in the design of index insurance are supporting the modelling of the forecast-based index insurance. This initiative intends to use insurance to 'fuel' anticipatory action through early payouts that support preparedness measures ahead of high-severity events.

How the instrument works

This meso-level insurance scheme is designed to provide financial support to WFP and, eventually, to national or local entities to complement the anticipatory action framework in case of high-severity dry spells. It is activated by two forecast triggers:

1. The 'early planting season trigger' (March) is based on rainfall projections for the June–July–August growing season.
2. The 'dry spell trigger' (June) is based on rainfall predictions for the July–August–September–October dry period.

Forecast models have been developed in collaboration with INSIVUMEH and IRI, ensuring scientific accuracy and local relevance. The accuracy and robustness of the forecasting models have benefitted from the integration of the NextGen systems and the Python Interface to the Climate Predictability Tool (PyCPT).

The goal is that when forecasts indicate below-average rainfall, the insurance policy activates payouts to WFP initially and, in the mid and long term, to national or local entities responsible for disaster prevention, preparedness, response and recovery. Payouts will be based on pre-established criteria, including food insecurity levels, socio-economic conditions and climate vulnerability. Payouts will support pre-agreed anticipatory actions, which could include the distribution of drought-resistant seeds to enhance agricultural resilience, and the provision of food assistance that covers approximately one month of household needs through cash transfers or in-kind support. These actions will be outlined in municipal response plans, allowing communities to prepare for and mitigate the effects of anticipated climate shocks.

Challenges and how they were addressed

Although the forecast-based index insurance scheme is still under development at the time of writing, important lessons have already emerged from the design phase, which involved navigating several technical, operational and institutional challenges.

One major challenge was calibrating reliable forecast triggers that are both acceptable to the insurance industry and suitable for implementing anticipatory actions within practical timelines. Initially, the technical design of the scheme in Guatemala relied on the ERA5 model, complemented by observations from the Copernicus satellite constellation. This approach established a forecasting threshold indicating the probability of below-average rainfall during the critical planting season (July to August) in the Dry Corridor. However, the model only provided a ten-day lead time, which is insufficient for smallholder farmers to take effective anticipatory actions. This limitation prompted WFP to reassess the design and develop a model aligned with the same triggers used for anticipatory action.

3 The Dry Corridor is a geographic region in Central America characterized by recurrent drought, high temperatures and food insecurity, largely due to climate variability and change. It stretches from southern Mexico through Guatemala, El Salvador, Honduras and Nicaragua, sometimes including Costa Rica.

To ensure that forecast triggers are both credible and timely, WFP partnered strategically with the insurance industry and technical service providers. In Guatemala, WFP collaborated with MiCRO, IRI and INSIVUMEH to refine locally tailored rainfall models. This collaboration enhanced the accuracy of the insurance triggers and improved the overall effectiveness and credibility of the scheme. The integration of NextGen systems and the PyCPT further enhanced forecasting accuracy. In addition, the insurance industry's expertise in risk management, data auditing and interpreting datasets was essential, particularly in proposing alternative methodologies aligned with designing anticipatory actions. WFP continues to work closely with index insurance specialists who are willing to innovate and contribute meaningfully to the modelling process.

Another challenge was identifying efficient distribution and delivery mechanisms, along with establishing an enabling environment to support implementation. WFP and other stakeholders proposed meso-level schemes where national and local entities play critical roles. This approach ensures that contingent finance can rapidly reach the most vulnerable and food-insecure populations. However, regulatory constraints limiting the ability of these entities to enter insurance contracts, pay premiums or receive payouts are a serious barrier. These constraints have important implications for sustainability, as they may hinder the allocation of premiums and ultimately limit the scheme's scalability.

To overcome these obstacles, WFP and local stakeholders are continuously exploring options to adopt a roadmap that strengthens the capacity of national and local entities to actively participate in forecast-based index insurance schemes over the mid and long term. In the interim, WFP will support the operationalization of the insurance scheme and create space for institutional capacity strengthening, especially given that these entities are already involved in WFP's anticipatory action framework. Additionally, dedicated support will be provided to foster an enabling environment where such entities can effectively access financial instruments capable of mobilizing funding for anticipatory action.

Pathways for improvement

Despite these improvements, a critical challenge persists: the traditional perception of insurance and its role. In the context of the climate crisis, there is an opportunity for the insurance industry and other stakeholders to broaden their approach and explore how insurance can mobilize funding for anticipatory action. Forecast-based index insurance aims to unlock payouts that help cover costs to prevent or mitigate the impact of climate shocks before they occur, rather than solely compensating for losses after the fact. This represents a critical shift that calls for innovative thinking and collaboration.

Case study 5: Tearfund's multi-country DRF pilot

Drought is one of the most severe climate hazards affecting low-income communities, where financing mechanisms to cope with its impacts are often limited. Climate change is increasing the frequency and severity of droughts, making it harder for vulnerable communities to recover and build resilience. Tearfund, an international Christian relief and development agency, has been supporting affected communities to adapt to these changing conditions, but long-term adaptation requires sustained efforts.

To address these devastating shocks in the here and now, Tearfund is implementing a multi-country, meso-level parametric insurance pilot. Operating in Ethiopia, Malawi, Nepal and Pakistan, it supports communities to take anticipatory actions ahead of the impacts of predicted droughts.

Now in its second year of a four-year programme, the pilot currently focuses on drought risk and provides coverage for approximately 10,000 households. Over the next two years, Tearfund plans to expand the programme to include additional hazards and increase coverage to 30,000 households, with Mozambique and Zimbabwe the new target countries.

How the instrument works

The insurance policy is technically a derivative risk-transfer agreement, held and paid for by Tearfund's UK office. The agreement is with the Natural Disaster Fund, with Global Parametrics as its fund manager. This is a donor-backed facility, capitalized by the UK's Foreign, Commonwealth and Development Office and Germany's KfW on behalf of the Federal Ministry for Economic Cooperation and Development.

The instrument uses Global Parametrics' Water Balance Index, a tool designed to estimate soil moisture levels anywhere in the world, which draws on data (e.g., rainfall and temperature levels) from the open-source ERA5 satellite dataset, with calculations updated daily. The index is tailored to the specific geographical areas covered by the policy and informed by the lived experience of drought in the participating communities. It is developed through in-depth community consultations and farmer surveys to align with the periods when drought would have the greatest impact on food security, typically during major cropping seasons in each target district.

To function as an anticipatory tool, the Water Balance Index is calculated using a 40-day rolling window. This means it takes 40 days' worth of data to generate a cumulative index. In a 160-day growing season, the first calculation – and first opportunity for a payout – occurs after 40 days, still three months before harvest. This allows for 120 additional days (160 minus 40) for a payout to be triggered, while also providing ongoing validation of how well the index reflects real drought conditions.

Tearfund's policy with Global Parametrics includes three trigger levels, each corresponding to increasing drought severity. Payouts range from 100,000 US dollars to a maximum of 350,000 US dollars per country, with an overall portfolio cap of 750,000 US dollars across the four participating countries. Funds are received by Tearfund's UK office and then disbursed to its country offices and local partners. Each country has a pre-agreed anticipatory action plan for drought that is developed in collaboration with communities and relevant government stakeholders. Specific actions vary by severity level and trigger, ensuring that responses are relevant and appropriate.

In February 2025, the scheme was triggered in Malawi due to a mild drought, resulting in a payout of 100,000 US dollars. In partnership with Eagles, a Malawi-based Christian development organization that is Tearfund's local partner, the funds were used to support 1,200 families with drought-tolerant, high-nutrition vegetable seeds and saplings.

In May 2025, the policy was triggered again, this time in Pakistan and at the highest severity level, with a payout of 350,000 US dollars. This aligns with the current extreme drought affecting the target area. At the time of writing, there are ongoing discussions with the local government to finalize the intervention, which will likely include a mix of cash transfers, food aid and support for water conservation and storage.

Challenges and how they were addressed

One early challenge was that constructing a location-specific Water Balance Index required detailed insight into local experiences of drought. In partnership with Eagles and Global Parametrics, Tearfund developed customized surveys and site-specific community-consultation tools to gather the necessary data. This process helped to identify the primary sources of food security affected by drought in each of the four target districts. The growing seasons for these crops were then used to define the risk windows when the insurance policy would be active.

Global Parametrics then used 40 years of historical climate data to model the Water Balance Index and compare its predictions with reported drought events. This validation exercise helped to reduce basis risk and assess where payouts would have been made had the policy been in place, strengthening confidence in the index design.

The Malawi payout in February 2025 illustrated the importance of flexibility during the implementation of anticipatory action plans. Although pre-agreed plans were in place, the payout was used differently to initial expectations. Instead of food aid or cash transfers, the intervention pivoted to meet evolving needs on the ground, providing drought-tolerant seeds, saplings and farming training to 1,200 households.

Securing funding for the pilot also posed challenges, particularly for the initial build costs and the recurring insurance premiums. Anticipatory disaster insurance was not well understood by Tearfund, local partners or many of the traditional donors. While the value of helping people avoid or reduce disaster impacts was widely accepted, finding suitable sources of finance proved difficult.

This began to change with the development of a collaborative relationship with Global Parametrics and the involvement of the Howden Group Foundation, which later became Humanity Insured. Over a two-year period, Tearfund and Global Parametrics co-developed the concept of a four-year pilot to test the relevance and feasibility of disaster insurance for Tearfund's work. Global Parametrics played a dual role, serving as fund manager for the Natural Disaster Fund and technical adviser in developing the bespoke Water Balance Index for each country.

Together, Tearfund and Global Parametrics secured funding for the first 15 months of the pilot. This initial phase focused on building country-specific indices and strengthening the capacity of Tearfund and its partners to understand and engage with insurance mechanisms.

Additionally, Humanity Insured agreed to subsidize the first three years of insurance premiums through a sliding scale model. This provided Tearfund with time to refine its fundraising approach and, following the first payouts, begin to demonstrate the value of insurance as an effective investment in reducing disaster impacts.

Pathways for improvement

A persistent challenge has been the limited understanding of, and scepticism towards, insurance, particularly parametric insurance. Many international and local NGOs are unfamiliar with such financial instruments, creating a steep learning curve for Tearfund, its partners and senior decision-makers. In the early stages, Tearfund required specialized legal advice at significant cost before the first risk-transfer agreement could be signed.

One area for improvement identified through this process is the need for greater education and internal capacity building around the role of insurance in disaster risk financing. Insurance is not a stand-alone solution; rather, it complements other funding mechanisms and long-term risk-reduction efforts as part of an integrated approach, such as risk layering and blended finance.

In response, Tearfund and Global Parametrics have invested in strengthening institutional understanding across teams and with local partners. They have also worked proactively to manage expectations with local governments and communities to reduce the risk of misunderstanding around the timing and conditions of payouts. These efforts highlight the importance of early and ongoing engagement, internal education and clear communication as critical pathways for improving the uptake and effective use of anticipatory insurance mechanisms in the humanitarian sector.

2.3 Micro-level insurance

Micro-level insurance, or microinsurance, provides financial protection at the individual or household level, targeting vulnerable populations who are typically excluded from traditional insurance markets. These instruments are tailored to meet the specific needs of low-income groups such as smallholder farmers, pastoralists, fisherfolk, informal workers, and micro, small and medium enterprises, who are disproportionately affected by climate-related shocks.

The De-risking, Inclusion and Value Enhancement of Pastoral Economies (DRIVE) project, which links index-based livestock insurance with early action for pastoralists in the Horn of Africa, provides a leading example of micro-level disaster risk financing integrated with anticipatory action.

Case study 6: the World Bank's DRIVE project

In the arid and semi-arid regions of the Horn of Africa, pastoralism is a primary livelihood for millions of people. However, recurrent droughts severely threaten pastoral communities, leading to significant livestock losses and economic hardship.

Traditional humanitarian-response mechanisms have often arrived too late to prevent catastrophic losses, leaving pastoralists vulnerable to long-term poverty cycles. Recognizing these challenges, the DRIVE project was introduced in Kenya in 2022, with planned expansion into Djibouti, Ethiopia and Somalia. Funded by the World Bank, it is designed to strengthen the financial resilience of pastoralists by integrating index-based livestock insurance, savings mechanisms and market access support. Unlike traditional relief-based approaches, DRIVE aims to provide early financial protection, allowing pastoralists to take proactive measures before drought conditions fully materialize.

The initiative is implemented through a multistakeholder collaboration, coordinated by ZEP-RE (PTA Reinsurance Company). National and regional insurers underwrite the insurance policies, while technical partners such as ACRE Africa and Planet support data-driven monitoring. While banks and mobile-network operators facilitate payments, development organizations and cooperatives serve as aggregation partners, ensuring broad participation. By linking financial protection with early action and market inclusion, DRIVE represents a scalable model for climate resilience among vulnerable pastoralist communities.

How the instrument works

The DRIVE index-based livestock insurance model is designed to protect pastoralists against drought-induced forage scarcity through a parametric insurance product that triggers payouts based on satellite-derived vegetation data (the Normalized Difference Vegetation Index). Rather than relying on traditional loss assessments, this model ensures that payouts are automated and timely, enabling pastoralists to secure resources before a crisis escalates.

The model follows a tiered payout structure, distributing funds at critical points in the season to support both early actions and post-event recovery. A partial payout is issued mid-season if forage conditions drop below the 25th percentile, allowing pastoralists to purchase feed, water and veterinary services to sustain their herds. If conditions continue to deteriorate, a full payout is triggered at the end of the season, with the entire insured sum disbursed once forage availability falls to the 5th percentile, signalling extreme drought conditions. To ensure accessibility, funds are distributed digitally through mobile money, bank accounts or agent-based networks, minimizing delays in even the remotest areas.

Unlike sovereign risk pools, where funds are pre-programmed into government contingency plans, DRIVE gives pastoralists full autonomy over how they use the payouts, allowing them to respond based on their immediate needs. Some pastoralists are encouraged to participate in savings schemes, using a portion of their payouts or livestock income to build financial buffers for future climate shocks.

Challenges and how they were addressed

The implementation of the DRIVE index-based livestock insurance model has encountered several challenges, particularly around the affordability of premiums, limited financial literacy, trigger sensitivity, basis risk, and infrastructure constraints.

A primary concern has been the affordability of premiums. While governments subsidize premiums for up to five tropical livestock units per household, pastoralists with larger herds struggle to cover the additional costs, limiting their ability to fully protect their livestock. This reliance on subsidies also raises concerns about long-term financial sustainability, as the model must eventually transition towards a more self-sustaining structure. To address this, governments continue to provide subsidies to ensure accessibility, while pilot programmes exploring alternative cost-sharing mechanisms (e.g., pooled savings and public–private partnerships) are being tested to reduce dependency on external support.

A major obstacle to adoption is limited financial literacy and insurance scepticism. Many pastoralists have no prior experience with formal financial products and often misunderstand parametric insurance, expecting payouts for direct livestock losses rather than forage scarcity. This confusion has contributed to low uptake in some areas. In response, DRIVE has implemented mobile-based education campaigns, local training workshops, and outreach through trusted intermediaries such as community elders and cooperatives. These efforts aim to simplify insurance concepts, build trust and clearly communicate the product's purpose and benefits.

Trigger sensitivity has also posed a technical challenge. When thresholds are set too low, payouts become frequent and costly, reducing the financial viability of the scheme. Conversely, thresholds that are too high may delay payouts until it's too late for pastoralists to take meaningful early action. Compounding this issue is basis risk: traditional index-based insurance models assume fixed locations, yet pastoralists migrate across vast rangelands in search of forage. Without mechanisms to account for this mobility, coverage gaps can emerge, leaving some pastoralists unprotected.

To address these challenges, the project is refining its trigger mechanisms. This includes efforts to integrate real-time ground observations with satellite-based Normalized Difference Vegetation Index readings, reducing basis risk and improving payout reliability. Additionally, AI-driven weather modelling is being explored to enhance predictive accuracy and ensure timely and appropriate payouts.

Infrastructure barriers remain another constraint. While mobile payments enable the quick disbursement of funds, some pastoralist areas suffer from poor network connectivity, delaying access to funds. Furthermore, indices based on the Normalized Difference Vegetation Index may not fully capture local environmental conditions, such as bush encroachment, invasive species or soil degradation. These discrepancies between satellite data and ground realities highlight the need for the ongoing refinement of monitoring tools.

To address these operational hurdles, DRIVE has expanded partnerships with mobile network operators and financial service providers, helping to extend cash distribution networks into remote areas. These partnerships ensure that pastoralists can access payouts without undue delay, even in hard-to-reach regions.

Pathways for improvement

Despite these improvements, several challenges remain. The transition from a subsidy-dependent model to a financially sustainable structure is an ongoing concern. While government support has driven early adoption, the long-term success of index-based livestock insurance depends on finding alternative financing strategies that do not place excessive financial burdens on pastoralists.

The impact of climate variability on forage availability further complicates index performance. As climate patterns shift, the system, which is based on the Normalized Difference Vegetation Index, must continuously evolve, incorporating higher-resolution satellite imagery and ground-based verification to maintain its accuracy.

Encouraging savings and financial preparedness remains a work in progress. While some pastoralists have begun setting aside funds, broader uptake is still limited. Behavioural incentives and structured savings programmes need to be strengthened to build long-term resilience.

Ensuring coverage continuity for migrating pastoralists is another priority. Adjustments to insurance unit structures and the use of geospatial tracking tools could help to extend coverage across grazing areas, reducing gaps in protection and minimizing basis risks.

Ultimately, the DRIVE index-based livestock insurance model provides a replicable framework for integrating disaster risk financing with anticipatory action at the household level. However, continued investment in trigger optimization, financial sustainability and community engagement will be essential for scaling up its impact across the Horn of Africa and beyond.

2.4 Bridging disaster risk financing and anticipatory action: key insights from the case studies

The integration of disaster risk financing with anticipatory action remains in its early stages, with most initiatives concentrated at the meso level. The case studies examined in this section illustrate emerging innovations, good practices and persistent challenges in using insurance to fund anticipatory action.

Macro-level innovations

At the macro level, regional risk pools such as ARC and PCRIC are pioneering anticipatory insurance for governments, offering a layered insurance policy with triggers to fund anticipatory action and post-disaster response. With ARC making its first anticipatory payout in 2025, these mechanisms are demonstrating their potential to support timely action and resilience. While challenges remain, such as government buy-in, administrative processes and long-term financing, the experiences to date provide valuable lessons and opportunities to refine and scale up sovereign-level solutions for broader impact.

Meso-level advancements

At the meso level, international organizations are driving innovation in anticipatory insurance, with promising pilots led by UNCDF in Fiji, WFP in Guatemala, and Tearfund's multi-country initiative. These schemes are gaining traction by offering localized financial protection that empowers communities to act before a crisis fully unfolds. A key feature across these models is their greater focus on local ownership, with pre-agreed action plans developed in collaboration with cooperatives, local governments and community stakeholders. While important progress has been made, refinements in areas such as the affordability of premiums and trigger calibration are under way and will further enhance their impact and scalability. At the time of publication, Tearfund had made its first payout.

Emerging micro-level models

At the micro level, DRIVE's index-based livestock insurance stands out as one of the few models for disaster risk financing and anticipatory action that is designed for individual households. By linking early warning triggers with payouts, this initiative enables pastoralists in Djibouti, Ethiopia, Kenya and Somalia to take early actions such as purchasing livestock feed and water before drought conditions worsen. However, low financial literacy, limited insurance adoption and mobile connectivity constraints highlight the complexities of scaling up micro-level solutions in fragile ecosystems.

3. Recommendations and conclusions

Using insurance to fund anticipatory action represents a new frontier in disaster risk management. The case studies presented here illustrate the potential of insurance to enable anticipatory action, yet they also reveal significant challenges that must be addressed to enhance its effectiveness, scalability and sustainability. This section outlines four main challenges and how they could be addressed; these are synthesized in Table 1.

Table 1. Challenges and potential solutions

Challenge	Issues	Recommendations
Affordability of premiums	• High premium costs. • Reliance on external funding.	• Smart subsidies and cost-sharing models (tiered subsidies reducing over time). • Leverage blended finance (e.g., grants, loans, private sector investment) and regional/national risk pooling.
Trigger sensitivity and accuracy	• Identifying the right trigger thresholds: low thresholds increase costs, while high thresholds reduce the benefits of acting early. • Data limitations affect the accuracy and reliability of triggers.	• Dual-trigger mechanisms. • Investments in high-resolution data and AI-driven forecasting. • Hybrid-trigger models.
Trust in and awareness of insurance	• Insurance scepticism, especially for forecast-based models.	• Awareness campaigns. • Participatory insurance design. • Generate impact evidence.
Institutional and operational capacity	• Delays in fund disbursement due to governance limitations. • Bureaucratic inefficiencies. • Weak financial infrastructure. • Lack of implementation capacity.	• Mandatory frameworks for anticipatory action. • Pre-approve procurement agreements and fast-track fund-release processes. • Expand financial inclusion via mobile banking and social protection systems.

3.1 The affordability of premiums

The challenge

The affordability of premiums and people's willingness or ability to pay for insurance remain central challenges in its use to fuel anticipatory action. While donor-supported premium subsidies have incentivized the purchase of insurance, and thus demonstrated the feasibility of using it to fund anticipatory action, the long-term sustainability of these projects/pilots remains uncertain. Without continued subsidies, maintaining coverage beyond initial project cycles may be difficult for many policyholders. In some cases, the cost of premiums is perceived to outweigh the potential benefits, a perception that may be compounded by ongoing scepticism and limited trust in insurance systems.

The way forward

To ensure sustainable financing, several strategies can be applied:

- **Smart subsidies and cost-sharing models** introduce tiered premium structures, where subsidies gradually decrease. Governments and donors can co-finance premiums initially, while designing phased exit strategies as trust in the insurance model grows.
- **Blended finance models** use a mix of donor grants, concessional loans and private sector investments to make insurance more affordable and distribute costs more equitably. Regional risk-pooling mechanisms, where multiple countries share financial risks, can also lower the overall costs. At the micro level, the DRIVE project demonstrates how co-financing between governments, development partners and private insurers make it possible for pastoralists to access insurance in the first place.

Ultimately, ensuring insurance remains affordable while reducing dependency on donor funding is essential for securing sustainability beyond short-term pilots.

3.2 Trigger sensitivity and accuracy

The challenge

Determining the optimal threshold for triggering insurance payouts to finance anticipatory action is a persistent challenge. It directly influences both the effectiveness of early support and the affordability of premiums. Lower thresholds enable quicker interventions but drive up premium costs, potentially making insurance unaffordable. Conversely, thresholds that are too high may delay support until it is too late, undermining the purpose of anticipatory action.

A deeper challenge lies in identifying adequate and reliable triggers. The case studies revealed issues with data granularity – the spatial and temporal resolution of the data must reflect local realities (e.g., ARC, index-based livestock insurance, Tearfund, WFP) – and with data availability itself (e.g., ARC, WFP). These limitations can lead to poorly calibrated thresholds or inaccurate models, ultimately affecting the credibility and reliability of insurance-based anticipatory action. Encouragingly, the case studies also illustrate how these issues can be addressed in practice.

The way forward

A range of solutions has emerged to address trigger sensitivity and accuracy, each responding to different aspects of the challenge. Key among them are dual-trigger mechanisms, hybrid-trigger models and improved data integration.

- **Dual-trigger mechanisms.** These create two separate payout stages: one for anticipatory action and another for post-disaster response. This approach was adopted in four of the six case studies (ARC, PCRIC, UNCDF, WFP). It offers financial protection across different crisis phases by combining early interventions with later-stage recovery. For example, in the UNCDF case in Fiji, the anticipatory payout is tiered based on hazard severity, with stepped payouts of 10, 15 or 20 per cent of the insured sum, which allow communities to act proportionately ahead of a hazard's impact.
- **Hybrid-trigger models.** These combine data-driven triggers with context-specific expert validation. Depending on the hazard, many humanitarian organizations already use hybrid models. A hybrid approach still includes thorough monitoring of predetermined hazard variables, though the trigger itself might rest on decisions by local experts. While these models still require a deep understanding of past disaster impacts, they provide a middle ground between fully automated data-driven approaches and purely human decision-based triggers, offering a more efficient and adaptive method for anticipatory action.
- **High-resolution data and AI-driven analytics.** Investments in data (e.g., Tearfund) and/or expanding the use of remote sensing and AI-driven weather modelling (e.g., ARC) could be one way to improve trigger accuracy. Tearfund's use of a customized Water Balance Index, tailored to community-validated seasonal windows, demonstrates how combining remote-sensing data with lived experience improves model sensitivity and relevance. Similarly, ARC is working to incorporate AI-driven analytics and alternative datasets to accelerate the validation of drought triggers. These innovations can reduce basis risk and strengthen confidence among stakeholders by ensuring that triggers reflect on-the-ground realities more accurately.

Ensuring that insurance models evolve to capture localized, high-resolution climate risks will be essential for strengthening anticipatory payouts and optimizing premium pricing

3.3 Trust in and awareness of insurance

The challenge

Building trust in insurance remains a significant challenge as humanitarians, communities, cooperatives and even governments often approach insurance with scepticism. Many stakeholders, especially in the humanitarian and government sectors, perceive insurance as a 'black box', while many at-risk populations have little to no experience with insurance as a risk management tool, and those who do often distrust it due to past experiences with delayed or denied payouts.

The way forward

Building trust in (anticipatory) insurance requires participatory engagement, transparency and demonstrated impact. There are several ways to achieve this:

- **Community-led product design.** Engage directly with those who will rely on the insurance, such as governments, cooperatives, farmers, community leaders and other stakeholders, during the product development process. Involving them helps ensure the insurance reflects local needs and realities; it also fosters a sense of ownership and understanding among policyholders, which is essential for building trust. The case studies in this paper (UNCDP, WFP) show that participatory design can lead to stronger buy-in.
- **Educate (potential) policyholders.** A well-informed customer is a more trusting customer. An important role for insurers is to invest in 'insurance literacy' by clarifying models, pricing and payout structures. Effective methods for increasing such literacy among customers include educational workshops, webinars and question-and-answer sessions to explain how (anticipatory) insurance works, including its benefits and limitations, with regular refreshers to maintain understanding.
- **Seek external advice and validation.** Involve external experts, auditors or independent technical bodies to review the product design, trigger mechanisms and data sources. This could include verifying the fairness of premium pricing, the accuracy of risk models or the reliability of payout triggers. The Centre for Disaster Protection offers such a service.
- **Prove impact through data.** Governments and humanitarian agencies must collect and disseminate evidence that demonstrates the effectiveness of anticipatory insurance. Case studies should be used to show how early payouts reduce disaster losses and accelerate recovery, encouraging greater integration of insurance within national disaster-risk-management strategies.

By improving transparency, strengthening education efforts and demonstrating measurable impact, anticipatory insurance can gain wider acceptance and scale up more effectively as a disaster risk financing tool.

3.4 Institutional and operational capacity

The challenge

Anticipatory payouts have been limited so far, with only ARC and Tearfund having made payouts to date, and assessments of these payouts still under way. However, early experiences and design reviews suggest that translating payouts into timely and effective anticipatory action can be challenging. Emerging lessons from the case studies indicate that institutional and operational bottlenecks may hinder the swift implementation of planned activities.

These challenges often arise from a combination of governance constraints (e.g., limited administrative structures, weak financial oversight, restricted interagency coordination), bureaucratic processes (e.g., complex approval systems, slow procurement) and financial infrastructure gaps (e.g., limited banking access, underdeveloped digital-payment systems). Such constraints risk delaying early interventions, ultimately reducing the potential impact of anticipatory action. However, it is encouraging that these challenges are well recognized and that instrument designers are working to address them. Furthermore, the humanitarian and anticipatory action communities have already developed strong knowledge and best practices for strengthening financial delivery systems, often referred to as 'money-out' systems. This presents a valuable opportunity to reinforce the dialogue between those working on disaster risk financing and those working on anticipatory action, ensuring that payouts translate more swiftly and effectively into action on the ground.

The way forward

Insurance providers need to enhance policyholders' capacity to implement actions before the impacts of a forecast hazard fully unfold. Several strategies can be applied to ensure that early payouts translate into meaningful action:

- **Pre-approved anticipatory action plans.** These serve as standard operating procedures that clearly define who does what, when and how in the lead up to a forecast hazard. They clarify roles, responsibilities and decision-making processes, promote cross-sectoral coordination, and outline the specific interventions to be implemented. For greater impact, such frameworks should be embedded within national disaster-risk-management strategies, policies and plans (if governments are the policyholders) or integrated into organizational protocols (if risk aggregators hold the policy). This ensures that anticipatory action becomes a core element of disaster preparedness, rather than a parallel or stand-alone initiative.

- **Pre-approved supplier agreements.** Establishing pre-approved vendor contracts for emergency resources (e.g., drought-resistant seeds, food assistance, water storage) will reduce procurement delays and ensure rapid deployment.
- **Fast-track fund-release mechanisms.** Governments should implement forecast-based spending approvals, allowing funds to be pre-authorized for release as soon as predefined insurance triggers are met.
- **Social protection systems.** By leveraging social protection systems, anticipatory risk financing can be more efficient, timely and targeted, ensuring that vulnerable populations receive support before disasters cause severe humanitarian impacts. Many governments and humanitarian agencies already operate cash-based social protection programmes, making them an effective channel for pre-disaster payouts. Shock-responsive social protection allows these programmes to expand in coverage, or in the amounts paid out, when an early warning trigger is met, providing early financial assistance to at-risk populations.
- **Drills and simulations.** These exercises are crucial to test the effectiveness of plans, protocols and guidelines, and the capacity of those responsible for carrying out anticipatory actions. Drills and simulations help stakeholders identify weaknesses before an actual disaster occurs, ensuring smoother execution when payouts are released.

Addressing these challenges will help to ensure that anticipatory insurance mechanisms achieve their full potential in mitigating disaster impacts.

3.5 Conclusions

Addressing these interconnected challenges is crucial for unlocking the full potential of insurance as a tool for anticipatory action. While promising pilots and early applications of anticipatory insurance are already under way, their long-term effectiveness depends on refining trigger models, strengthening institutional capacity and ensuring sustainable financing. The case studies examined in this paper highlight the need for greater collaboration between the disaster risk financing community – comprising practitioners, experts, policy-makers, and organizations focused on financial mechanisms – and the anticipatory action community, which includes humanitarian agencies, local responders, meteorological services, disaster management authorities and research institutions. While the former community primarily concentrates on 'money-in' mechanisms, the anticipatory action community focuses on 'money-out' systems, making their partnership highly synergistic. With sustained investment and collaborative learning, anticipatory insurance can evolve from isolated pilots into a reliable component of both disaster risk financing and disaster preparedness.

References

Anticipation Hub. *Anticipatory Action in 2022: A Global Overview.* Berlin: Anticipation Hub, 2023.
tinyurl.com/3esuy5cs

Anticipation Hub. *Anticipatory Action in 2023: A Global Overview.* Berlin: Anticipation Hub, 2024.
tinyurl.com/muu47sj2

Anticipation Hub. *Anticipatory Action in 2024: A Global Overview.* Berlin: Anticipation Hub, 2025.
tinyurl.com/2h69y7w9

IASC. *Outcome Document. Commitments: Grand Bargain Caucus on Scaling Up Anticipatory Action.* Geneva: Interagency Standing Committee, 2024.
tinyurl.com/3exh94b2

ICRC. *When Rain Turns to Dust: Understanding and Responding to the Combined Impact of Armed Conflicts and the Climate and Environment Crisis on People's Lives.* Geneva: International Committee of the Red Cross, 2020.
tinyurl.com/4rbjjd48

IPCC. *Sixth Assessment Report.* Geneva: IPCC, 2023.
tinyurl.com/49kj5b32

International Conference of the Red Cross and Red Crescent. *IC34 Resolution IC34/24/XX.* Geneva: International Red Cross and Red Crescent Movement, 2024.
tinyurl.com/3myck5rc

Plitcha, M. and Poole, L. *The State of Pre-Arranged Financing for Disasters.* London: Centre for Disaster Protection, 2024.
tinyurl.com/3r3389hf

The Anticipation Hub is an initiative of

IFRC

German Red Cross

Climate Centre

Supported by

german humanitarian assistance

This report is published in partnership with the Munich Climate Insurance Initiative, hosted at the United Nations University Institute for Environment and Human Security.

MCII