

# BUILDING A CLIMATE RESILIENT FUTURE

## FIVE PRIORITIES FOR THE GLOBAL INSURANCE INDUSTRY



This report is a joint initiative between the UN Climate Change High-Level Champions, the UN Race to Resilience, the Adrienne Arsht-Rockefeller Foundation Resilience Center, and Marsh McLennan. It is prepared with the research, writing, and support of Oliver Wyman.

# Statement of purpose

A note from a UN Climate Change High-Level Champion



The Race to Resilience Campaign (RtR) and the Sharm El Sheikh Adaptation Agenda (SAA) provide the frameworks that can help businesses deliver on adaptation and resilience: We urgently need to significantly enhance adaptation and resilience for communities, sectors, economies, and ecosystems upon which they depend against the impact of climate change. Without it we cannot deliver on the goals of the Paris Agreement. This year, I have worked closely with banks, insurers, and investors worldwide and have seen exceptional leadership in the private financial sector on adaptation and resilience — let's accelerate the solutions that are already there!

**Dr. Mahmoud Mohieldin**

UN Climate Change High-Level Champion for COP28;  
UN Special Envoy on Financing the 2030 Agenda; Executive Director of the IMF

# Foreword

Over the past two years, Marsh McLennan has worked closely with UN Climate Change High-Level Champions, its Race to Resilience team, and the Arsht-Rock Resilience Center to spur awareness and catalyze action around the urgent need to advance climate adaptation.

Since then, a global framework for protecting the world's most vulnerable has begun to take shape. The Sharm el-Sheikh Adaptation Agenda, ratified at COP27, sets actionable 2030 targets for 30 sectors that collectively aim to protect four billion people from the extreme impacts of droughts, floods, wildfire, heat, and other climate-related risks. The G7 launched the Global Shield to amass and deploy the financial resources needed to accelerate impact. And the topic of loss and damage has become central to multilateral negotiations, no longer relegated to the fringes of the dialogue.

Central to maintaining this momentum will be the active leadership of the insurance sector. We are the sector that possesses the analytical capabilities and risk finance expertise to drive innovation and scale impact. That is why we are proud to publish this second report — jointly with the Race to Resilience and the Arsht-Rock Resilience Center — on how the insurance sector can deliver that leadership. This report identifies many of the barriers impeding insurers from prioritizing risk reduction efforts and issues a series of actionable recommendations to overcome those challenges. Like last year, it also features a sampling of the best ideas and projects reflecting both the spirit and urgency of climate adaptation innovation.

On behalf of all the report's sponsors, we applaud those companies demonstrating change-making leadership, and urge the entire industry to consider its role in advancing the recommendations in this report.

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# 1. Executive summary

Over the past 50 years, the number of weather-related disasters has risen five-fold, with climate change generally accepted to be a primary driver. This rise, coupled with an increase in the value of assets and population movement to high-risk areas, has resulted in a significant increase in losses. Investing in adaptation and resilience is critical to combat these rising costs and ensure that communities around the world can better withstand and recover from disaster.

The insurance industry is uniquely positioned to support and reward investments in adaptation and resilience. Transferring risk through insurance coverage provides households, businesses, and communities with the funding they need to recover rapidly from disasters. Additionally, insurers have the data and risk expertise to encourage risk-reducing activities, enable more resilient communities, and directly invest in resilience. By playing a larger role in increasing resilience, insurers have the power to reduce overall weather-related losses, protect their existing markets, and expand coverage into new markets — the combination of which presents a \$71 billion annual revenue opportunity for the insurance industry.<sup>1</sup>

However, the insurance industry must address several barriers to fulfilling the potential for a more widespread role in adaptation and resilience. This report presents five recommendations on how the insurance industry can better address these barriers, build climate resilience, and seize commercial opportunities:

1. **Prioritize resilience as a strategic imperative.** Only 10% of insurers disclose resilience targets and metrics in their sustainability reporting, suggesting a lack of strategic focus on resilience in the industry. By prioritizing resilience, insurers can better steer products, distribution, and investment toward areas of the portfolio that are most at risk, ultimately improving the long-term viability of their businesses.
2. **Collaborate with the public sector and civil society to expand coverage.** Public-private

partnerships deliver higher levels of insurance penetration than private insurers alone. These partnerships, which can include government bodies, non-profits, community bodies and other organizations, provide insurers with access to underserved communities and protect existing markets from climate-driven premium inflation. Public-private partnerships will likely become increasingly important as the frequency and severity of weather-related disasters continues to rise.

3. **Improve accuracy and availability of climate-related data and analytics.** Insurers can better price risk, incentivize resilience, and expand coverage to underserved populations by improving data quality, data availability, and catastrophe modeling. This data can also be made available to governments and public utilities to better target resilience and adaptation activities for greatest impact.
4. **Create an industry standard around the concept “build back better.”** Ensuring rebuilding and infrastructure projects prioritize climate adaptation and resilience will significantly reduce financial losses from natural disasters. Insurers can directly facilitate and incentivize pre- and post-disaster structural improvements as part of their policies.
5. **Advocate for public policies and regulations that support resilience.** Insurers can educate government stakeholders and regulators on existing risks and the role insurers can play in increasing resilience. Insurers should get involved much earlier and to a greater degree in influencing community risk-based planning, building code regulations, and land-use decisions.

Supporting adaptation and resilience has clear commercial value for the insurance industry and fulfills an important social good. Insurers already have many of the tools at hand to expand their role beyond traditional risk transfer, but many have not undertaken the mindset shift that allows this potential to be realized. Successfully fulfilling this agenda will improve societal resilience and drive long-term success for insurers in the face of climate change.

## 2. Introduction

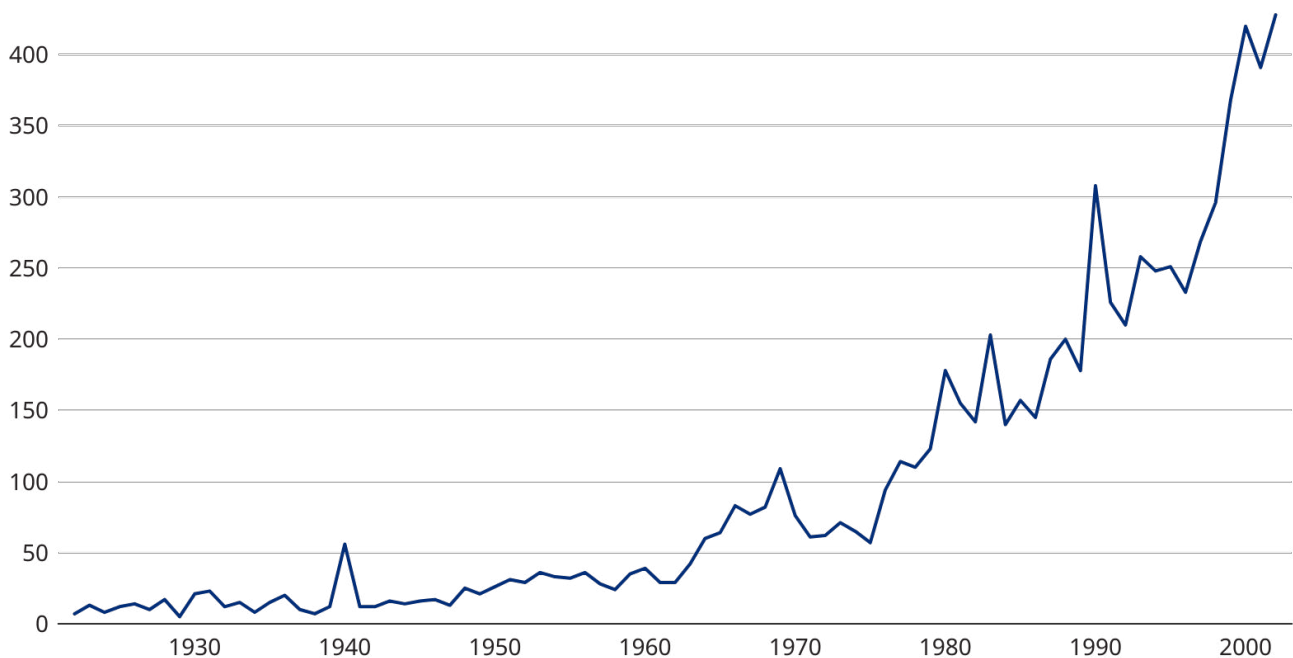
The intensification of heat waves, floods, droughts, wildfires, storms, and other climate-related hazards has far-reaching implications on communities and ecosystems globally.

The average global surface temperature has increased to 1.1 degrees Celsius above pre-industrial levels and the consequences are readily apparent for the increased frequency and intensity of natural disasters.<sup>2</sup> The latest Emissions Gap Report from the UN Environment Programme (UNEP) finds that current pledges under the Paris Agreement put the world on track for a 2.5-2.9 degrees Celsius temperature rise above pre-industrial levels this century.<sup>3</sup>

But with every additional one-tenth degree of warming, the number and severity of climate events can be expected to rise, as will the financial and human costs. Comparing the average number of weather-related disasters in the 1970s to the 2010s, there was an almost five-fold increase<sup>4</sup> (see Exhibit 1).

The increasing frequency and severity of extreme-weather events is compounded by population growth and economic development in high-risk areas due to urbanization — placing more people and economic activity in harm's way.<sup>5</sup>

**Exhibit 1: Historical number of weather-related disasters<sup>6</sup>**



Source: Oliver Wyman analysis based on "Our World in Data"

## The adaptation and resilience gap

### ADAPTATION

Refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects. It refers to changes in processes, practices, and structures to moderate potential damages or benefit from opportunities associated with climate change.<sup>7</sup>

### RESILIENCE

The capacity of social, economic, and environmental systems to cope with a hazardous event, trend, or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure while also maintaining the capacity for adaptation, learning, and transformation.<sup>8</sup>

Increased investment in climate adaptation and resilience is an urgent priority. Demand for adaptation finance in developing countries is 10 to 18 times greater than official adaptation finance flows, resulting in a financing gap of \$194 billion to \$366 billion a year.<sup>9</sup> Globally, estimates suggest less than 2% of adaptation finance currently comes from private sources while around \$3 trillion a year of investment in climate-resilient infrastructure is needed worldwide over the coming decade.<sup>10</sup> That gap between supply and need must be closed, and mobilization of private capital will be a critical source of additional funding.

In response, the UN Race to Resilience, launched in 2021 by the UN Climate Action High-Level Champions (HLCs), aims to increase the resilience of four billion climate-vulnerable people by 2030 through targeted investment in adaptation solutions. The Sharm-El-Sheikh Adaptation Agenda, released at COP27, defines concrete adaptation solutions and outcome targets for Race to Resilience partners to achieve. Both specifically identify the insurance sector as a key participant in scaling adaptation initiatives.<sup>11</sup>

### The unique role of the insurance industry

Arguably more than any other sector, the insurance industry is uniquely positioned to help close the adaptation and resilience gap. Insurers can:

- Support resilience by transferring risk from vulnerable communities and infrastructure, with evidence showing economies with higher rates of insurance coverage recovering faster from climate-related shocks<sup>12, 13</sup>
- Encourage investment in resilience by informing policyholders, communities, and businesses about the level and nature of their risk exposure, and setting prices and terms to encourage risk-reducing behavior
- Apply their risk management and risk-modeling expertise to contribute to the creation of safer and more resilient communities
- Advise infrastructure planning bodies on where particular risk exposures and points of vulnerability lie, allowing more resilient development and effective risk-aware planning
- Enable investment in resilient businesses, infrastructure, and nature-based solutions using both sides of the balance sheet — to channel capital and de-risk opportunities

Although the adaptation and resilience gap is greatest in developing countries, it is a global issue. In developing countries, lower incomes, lower-quality infrastructure, and reduced access to social protection and healthcare all contribute to insufficient levels of resilience. These countries also experience lower levels of insurance coverage because of limited product availability, poorly functioning distribution networks, and the relatively high cost of insurance. More broadly, climate change threatens to trap populations in a vicious circle of increasing disasters and declining resilience. In developed economies, insurance penetration may be higher, but there are still many pockets of underinsured communities. With rising climate-driven risks pushing the cost of coverage even higher, insurance becomes even more unaffordable and unavailable over the longer-term for these communities.

Supporting adaptation and resilience in the face of climate change is not just an opportunity, but a commercial imperative for the insurance industry. Without investment in adaptation and resilience, climate change may drive weather-related risks in certain regions to levels that are no longer insurable, eroding markets and shrinking profit pools. This is already starting to happen, for



example in the Western United States because of the threat of wildfires, and was a major driver for the establishment of the Australian Reinsurance Pool Corporation to cover cyclones and cyclone-related flood damage. However, building resilience can do more than protect existing markets. It can unlock new ones by improving the insurability of underserved communities and creating new business opportunities.

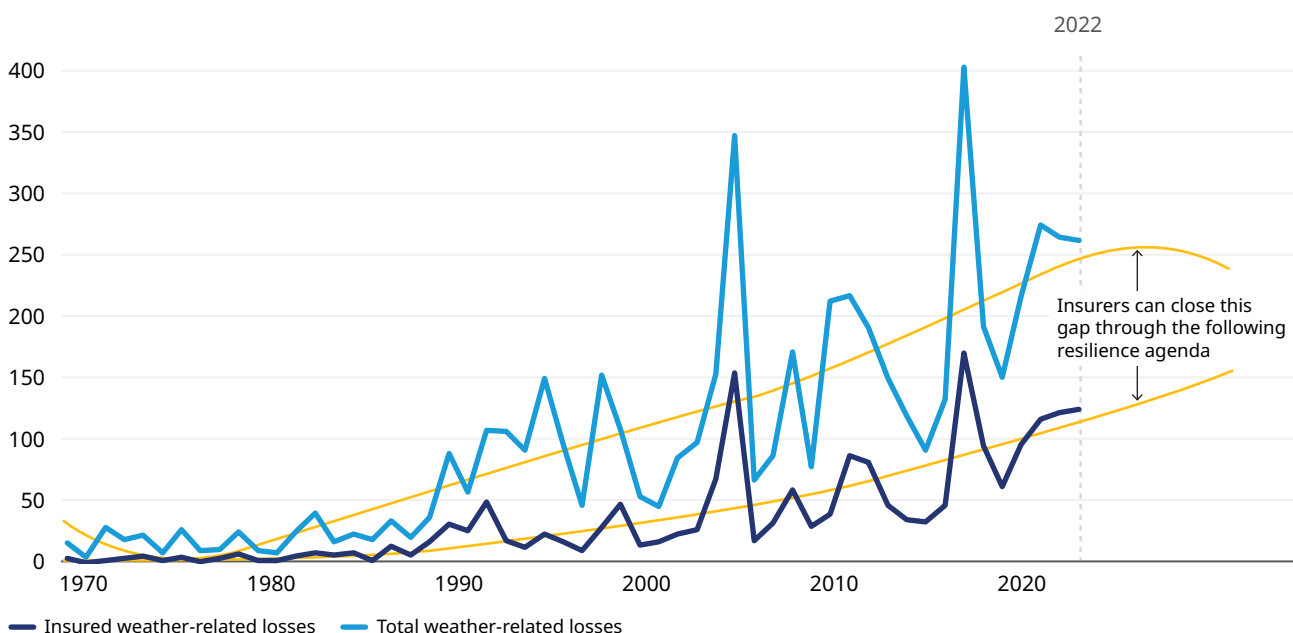
Currently, only 46% of global weather-related losses are insured, equating to a \$142 billion protection gap (see Exhibit 2). While this gap exists for a multitude of structural and socioeconomic reasons that cannot be solved by the insurance industry alone, insurers can pursue strategies that may help narrow the gap. By extending insurance

to additional communities, they can increase the proportion of losses covered by insurance, and by helping build resilience they can reduce the absolute losses that occur when disaster strikes. Neither of these are new ideas for the insurance industry, so the question we examine is how to do more, and do it more effectively.

Private insurers are ultimately commercial entities with responsibilities to their investors. So in this report, we set out a commercial agenda for the insurance industry to support the UN Race to Resilience. We estimate that, by pursuing this agenda, the industry can close up to 30% of the existing protection gap, presenting a \$71 billion annual revenue opportunity for insurers while contributing to the resilience of millions of people.<sup>14</sup>

## Exhibit 2: Protection gap for weather-related losses<sup>15</sup>

USD billion



Source: Oliver Wyman analysis based on Swiss Re Institute's Sigma publication from March 2023 titled "Natural catastrophes and inflation in 2022: A perfect storm"

## Purpose and summary of the report

This report supports the UN Race to Resilience and the Sharm-El-Sheikh Adaptation Agenda by addressing how insurers can undertake the vital work of scaling climate adaptation and resilience initiatives. The report draws upon research and perspectives from experts across Marsh McLennan as well as the broader insurance industry. It builds on last year's report, "Fulfilling a Legacy of Societal Risk Management," which was released at COP27 by the High-Level Champions, Adrienne Arsht Rockefeller Foundation, and Marsh McLennan.<sup>16</sup>

This year's report seeks to answer the following questions:

- What impact can the insurance industry have on climate adaptation and resilience if it were to operate at its full potential?
- What barriers does the insurance sector face to work toward climate adaptation and resilience efforts?
- How should the insurance industry address these barriers to accelerate and scale its impact?

In the report, we outline the below recommendations:

1. **Prioritize resilience as a strategic imperative**
2. **Collaborate with the public sector to expand coverage**
3. **Improve accuracy and availability of climate-related data and analytics**
4. **Create an industry standard around "build back better"**
5. **Advocate for public policies and regulations that support resilience**




While the primary audience for these recommendations is the private insurance industry — including private insurers, reinsurers, and brokers — we also hope to inform government bodies and regulators about how collaboration with the industry can be a key enabler for insurers to play a greater role in resilience.

# 3. Barriers to the insurance industry playing a more widespread role in adaptation and resilience

While the insurance industry already plays an important role in climate adaptation and resilience efforts, it could do a lot more. However, this requires overcoming a variety of internal and external

challenges. As detailed in Exhibit 3, these fall into three categories: Demand-side constraints, supply-side constraints, and regulatory and policy constraints.

**Exhibit 3: Barriers to insurance industry support of adaptation and resilience**

	Barriers which <i>directly</i> hinder adaptation and resilience	Barriers (exacerbated by climate change) which <i>indirectly</i> hinder adaptation and resilience
 <p>Demand-side constraints</p>		<p>Lack of awareness or understanding of climate-related risks and insurance benefits</p> <p>Moral hazard risk hindering insurance uptake</p> <p>Unaffordable coverage</p>
 <p>Supply-side constraints</p>	<p>Data and modeling capabilities not fully informing or supporting climate-related risks</p> <p>Traditional insurance policies not designed to incentivize system-level resilience</p>	<p>Cost and logistical challenges with aggregation and distribution</p>
 <p>Regulatory and policy constraints</p>	<p>Lack of public sector focus on risk reduction</p> <p>Regulations that restrict insurance efficacy</p>	

Source: Oliver Wyman analysis

## 3.1. Demand-side constraints

**Individuals and businesses often lack awareness of climate-related risks and the benefits of insurance.** Populations often do not properly understand the extent to which they are exposed to climate-related risks. When combined with

other factors such as low levels of financial literacy, mistrust of insurance, and behavioral biases such as anchoring (it hasn’t happened before), optimism (it won’t happen to me), or even the gambler’s fallacy (it won’t happen again), the result is insurance coverage insufficient to cover the ever-rising threat of climate change.<sup>17, 18</sup>

**Moral hazard hinders insurance uptake and risk mitigation.** All traditional insurance schemes face a degree of moral hazard arising from the possibility that insureds do not undertake risk reduction because the cost of a disaster will be borne by the insurer. However moral hazard is also particularly problematic when there is an expectation of government disaster relief. Although this can play an important role in helping affected communities recover, it can also have several unintended consequences. The promise of a bailout may mean households and businesses decide not to invest in resilience, or pursue risky behavior, such as building on flood plains. People may also decide that private insurance is unnecessary because they are effectively insured by the state.

**Risk-based pricing may result in unaffordable coverage for the most exposed communities.** Coverage affordability is already a challenge in many parts of the world. Climate change will exacerbate this problem, particularly for lower-income populations that ascribe a disproportional percentage of their intergenerational wealth to the equity in their homes.<sup>19</sup> But the problem is not confined to lower-income groups. As climate change progresses, accumulations of concentrated exposure in wealthier but higher-risk areas threatens to push risk-based premiums beyond the reach of a broad base of existing customers, threatening the stability and viability of insurance markets themselves.<sup>20</sup>

### 3.2. Supply-side constraints

**Data and modeling do not fully inform and support quantification and pricing of climate-related risks.** To make informed decisions about where and how to invest in resilience, households, businesses, and governments need access to reliable data in appropriate formats. However, this data is often not available, leading them to underestimate the degree of risk and the possible losses they face. Insurers may also confront data challenges that limit their ability to price risks and extend coverage. For example, in developing economies, poor data on

historical losses and asset vulnerability characteristics are a particular challenge in damage datasets.<sup>21, 22</sup> Another challenge relates to the incorporation of the impact of resilience efforts into pricing models, so that insurers can properly reflect the benefits of resilience in policy terms, and incentivize investment in risk reduction. One example of this is the recent focus on nature-based solutions (NBS), where the risk-reduction benefits of natural ecosystems are highly contextual and still being fully understood, and data and modeling capabilities are nascent.<sup>23</sup> But this is also a challenge for more mainstream products such as home insurance, where insurers may struggle to capture the benefits of flood resilience measures in their models.

Climate change brings additional modeling challenges. The catastrophe models insurers use for natural disasters are often anchored to historical datasets that may not represent the current climate, let alone the future climate. Although work is underway in many parts of the industry to develop climate-conditioned models, more work needs to be done before future climate scenarios are incorporated throughout industry models as a matter of course, and insurers can reliably quantify how portfolio risks are likely to evolve.

**The aggregation and distribution of insurance is challenging.** Distributing insurance in underserved markets can be expensive. This is particularly acute in developing economies where distribution and servicing costs can be prohibitive on a per policy basis relative to the underlying risk premium. In these cases, traditional distribution models may not be viable. More broadly, the historical model of distributing insurance on an individual, policyholder basis may be challenged by the systemic nature of climate-related risks. Communities could rather benefit from collective access to insurance via public-led enterprises and other mechanisms that centralize and aggregate policies and distribute to policyholders, reducing these per-policy administration costs.

**Traditional insurance policies are not designed to incentivize system-level resilience.** The long-



term nature of climate change does not align with the typical 12-month duration of an insurance policy. A short-term policy provides insurers with the strategic flexibility to reprice risks and steer their portfolios as climate change increases. However, the flipside is that insurance struggles to provide clear climate risk signals to policyholders, as changes in climate risk occur beyond the contract term.<sup>24</sup> Policy wording may also create problems for adaptation and resilience. For example, year after year, policies often include same site restrictions on structures that face repetitive damage and increasing climate-related risks, often prompting property owners to re-build without taking additional resilience-enhancing measures.<sup>25</sup>

### 3.3. Regulatory and policy constraints

**Governments favor disaster relief over disaster prevention.** Investment in ex-ante risk mitigation provides a significantly better return than ex-post disaster relief. Yet governments routinely spend far more on the latter. One US study, which considered natural catastrophe losses from wind, floods, earthquakes, and fires, found that risk mitigation returns an average of \$13 for each one dollar invested.<sup>26</sup> Despite this, analysis of the US Federal Emergency Management Agency's (FEMA) spending found only 14% was directed to risk mitigation, such as resilience-building programs.<sup>27</sup> On a global basis, only 12% of disaster management funds have been dedicated to pre-disaster resilience, with the remainder going to post-disaster response and recovery.<sup>28</sup>

Aside from being an inefficient use of public money, the emphasis on ex-post disaster relief has more pernicious consequences by creating moral hazard. It discourages investment in risk reduction and encourages risky behaviors among households and businesses. It also crowds out private insurance, as households and businesses are less willing to buy insurance if they believe they will receive a bailout when disaster strikes. Furthermore, there is a much

greater risk of wastage through fraud and inefficiency — an audit by America's Government Accountability Office found that as much as \$1.4 billion of the \$6 billion in federal emergency relief for victims of Hurricanes Katrina and Rita in 2005 went on improper or fraudulent payments.<sup>29</sup> As a result, the opportunity to transfer risk away from the government balance sheet to private markets, and to benefit from their efficient payments and risk management processes, is lost, and governments face a downward fiscal spiral as climate change increases ex-post disaster spending, further squeezing investment in resilience and leaving populations vulnerable to the next disaster.

**Certain policies and regulations can undermine insurance efficacy.** Insurance works best when the cost of cover reflects the level of risk. This price signal helps policyholders understand risk and incentivizes risk reduction and investment in resilience. Yet, in many countries, regulations inhibit price signals, either through restrictions on risk-based pricing, caps on premium pricing, or restrictions on using certain models to price risk.<sup>30</sup>

Regulations can also prevent insurers from using the full breadth of their capabilities to support resilience. Parametric insurance, which pays out according to pre-defined triggers, is particularly important for climate resilience as it pays out more quickly than traditional indemnity insurance and without restrictions on how funds are spent, allowing policyholders to recover faster. That said, parametric insurance is restricted in certain regions by requirements to show "proof of loss" to avoid treatment as a financial derivative.<sup>31, 32</sup>

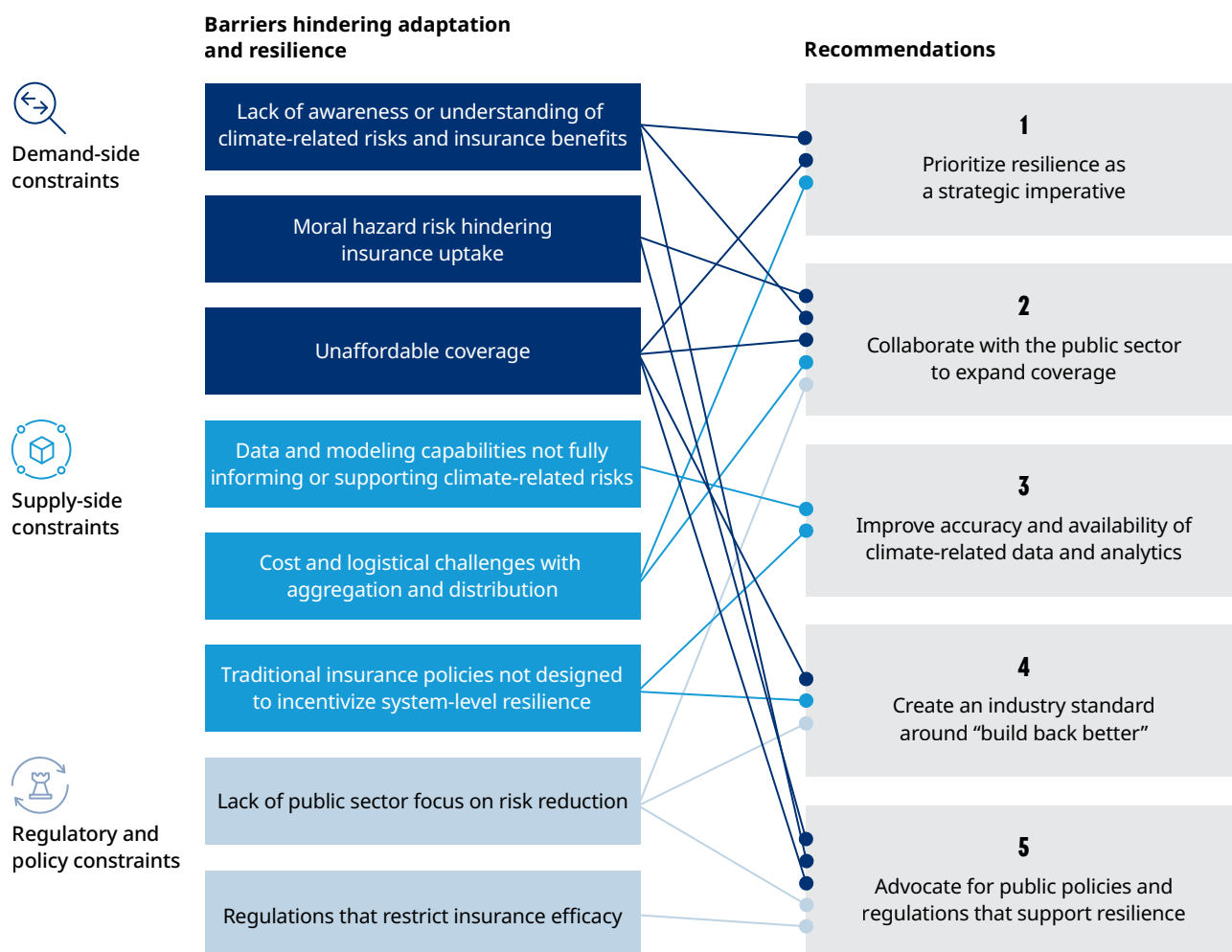
Other regulations around land-use planning and building codes can undermine resilience and insurability by encouraging (re)construction in high-risks areas, such as flood zones and wildfire areas, where risk will continue to increase with climate change, or failing to ensure that new buildings are built to a standard able to cope with future climate impacts.<sup>33</sup>

## 4. A resilience agenda for the insurance industry

Below we set out a five-point agenda for how the insurance industry can build climate resilience and seize related commercial opportunities. As shown in Exhibit 4, the five recommendations address multiple barriers, meaning that a concerted effort to pursue this agenda could unlock significant benefits and create mutually re-enforcing outcomes.

For each of the recommendations to be successful, the insurance industry will need to undergo something of a mindset shift and expand its existing “toolbox” beyond traditional risk transfer, to embrace a range of solutions and services designed to build resilience and enhance adaptation.

**Exhibit 4: Mapping barriers to recommendations**



Source: Oliver Wyman analysis

## RECOMMENDATION 1

### Prioritize resilience as a strategic imperative

#### COMMERCIAL BENEFIT OF THIS RECOMMENDATION

Making resilience a strategic priority enables insurers to expand their business and increase revenues via new products and distribution mechanisms that reach traditionally underinsured markets and assets. It also enables insurers to target initiatives that will have the most impact on building resilience, ultimately driving down overall losses and protecting existing markets.

By prioritizing resilience in near-term plans and defining an explicit resilience strategy, insurers can target areas of their portfolio that are most at risk, design products and broader initiatives to address many of the supply and demand barriers we identified earlier, and greatly improve the long-term viability of their business models.

#### The current state of insurance climate strategy

Despite the insurance industry's significant exposure to climate impacts and its unique position to benefit from increased climate resilience, the integration of adaptation and resilience into firm-wide strategy remains largely overlooked by most insurers and reinsurers, particularly when compared with the incorporation of emissions reduction and energy transition goals<sup>34</sup> (see Exhibit 5).

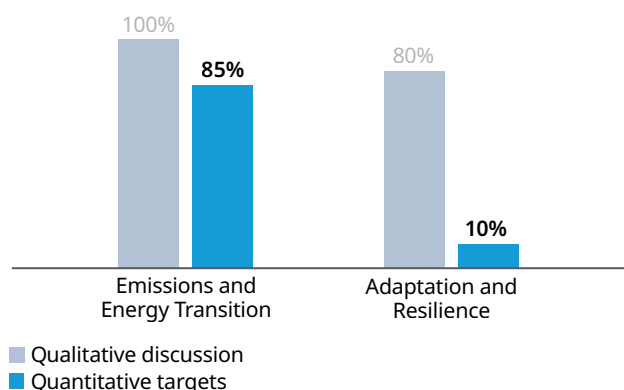
A review of sustainability reports and climate-related financial disclosures from 20 global insurers and reinsurers revealed that 100% of this sample discuss decarbonization and the energy transition and 85% have established comprehensive decarbonization and energy transition targets spanning different timeframes. On the other hand, comprehensive acknowledgement of the role of climate adaptation and resilience and quantifiable metrics are much less common.

While 80% of disclosures mention adaptation and resilience, this acknowledgment is often focused on philanthropy or broad, conceptual statements. Beyond philanthropy, only 10% of disclosures identify quantifiable adaptation and resilience targets. Within this 10%, targets are not necessarily comprehensive. They are also focused on short-term time horizons and lack the same level of robustness as corresponding carbon emissions and transition targets.

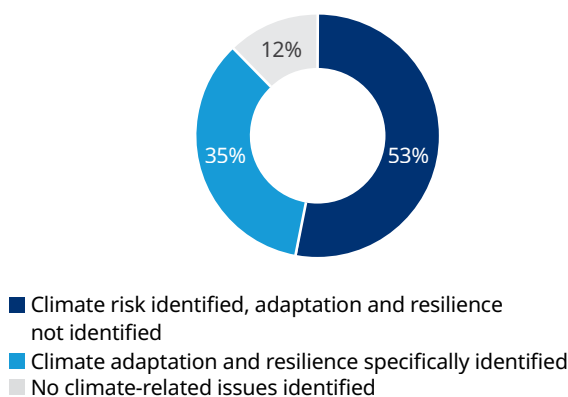
In a separate review of publicly available materiality assessments from the same sample, 88% of reports identified climate-related issues as a significant material risk in some capacity. However, only 35% specifically identified climate adaptation and resilience as a top-priority material outcome.

## Exhibit 5: Insurer focus on adaptation and resilience as part of climate strategy<sup>35</sup>

### 5.1 Climate-related targets and initiatives discussed in sustainability disclosures



### 5.2 Priority climate-related issues identified in materiality assessments



Source: Oliver Wyman analysis based on publicly available (re)insurer sustainability disclosures and materiality assessments

## Next steps for the insurance industry

The following five key priorities will enable insurers to make climate adaptation and resilience a strategic imperative:




1. **Encourage uptake of resilient solutions among investors and communities to address the challenges faced by a shrinking insurance sector.** By facilitating meaningful dialogues and building a resilience narrative, insurers can promote the adoption of resilience initiatives in strategic decision-making.

2. **Engage clients to increase their involvement in system-level, risk-reduction initiatives in key geographies.** This helps insurers better serve clients and contribute to climate resilience by advocating for collective action to tackle complex climate risks.
3. **Encourage proposition development to go beyond traditional risk transfer, through employee development and training in the importance and value of climate resilience.** These investments foster the behavioral change and human capital development necessary to adapt to evolving risks.
4. **Implement initiatives to better support climate resilience through the insights gained from risk assessment, for example, in the underwriting and claims processes.** Insurers can provide valuable support to their clients, address specific risks in their portfolios, and capture commercial opportunities.
5. **Define time-bound, quantifiable, and reportable metrics and targets for adaptation and resilience initiatives.** Defining success, in quantifiable terms, ensures accountability and can incentivize greater ongoing investment in resilience by measuring and acknowledging progress. Further, disclosures of these metrics can widen industry knowledge on the most successful initiatives.

Insurers already have many of the tools needed to support resilience, so improvements do not necessarily require complex innovation. Insurers can refine existing products and distribution mechanisms and utilize their investment capabilities to expand coverage and thereby increase resilience. As part of their strategy, insurers can also indirectly increase resilience by insuring investments in resilience and enabling resilience-building projects. Exhibit 6 details examples of opportunities in which insurers can increase resilience directly and indirectly through enhanced product offerings, distribution mechanisms and portfolio management. Additional examples and detail can be found in the supplement at the end of this report.



## Exhibit 6: Example opportunities for insurers to increase resilience

	TYPE	EXAMPLE IMPLEMENTATION
 <b>Product Offerings</b>	<b>Parametric insurance</b> Provides faster payouts to policyholders and enables quicker recovery	The African Risk Capacity (ARC) pools climate-related risk from partner countries, who pay premiums for parametric policies. After events, countries and specific stakeholders like farmers quickly receive payouts. <sup>36</sup>
	<b>Credit insurance</b> Provides financial stability to resilience-building projects	The Asian Development Bank and the International Finance Corporation both reached recent agreements with global insurers to mobilize co-financing capacity through credit insurance that unlocks financing for critical infrastructure projects, climate-resilience initiatives, and economic development in developing markets. <sup>37, 38</sup>
	<b>Climate-resilience consulting services</b> Supports businesses and communities in understanding how to build resilience strategies	Zurich's resilience solutions support clients in data collection, risk analysis, adaptation implementation, and climate-related reporting. <sup>39</sup>
 <b>Distribution Mechanisms</b>	<b>Improved distribution models</b> Utilizes technology and collaboration with a range of public and private partners to more effectively reach new markets and expand insurance coverage	<ul style="list-style-type: none"> <li>• Blue Marble, a microinsurance provider, created affordable parametric crop insurance to coffee farmers in Colombia. Blue Marble connects with local coffee growers through their partnership with Nespresso, who co-finances the premiums along with the Colombian government, with the ultimate objective of integrating the full cost into the products themselves, producing a more resilient supply chain.<sup>40, 41</sup></li> <li>• BIMA, a licensed insurance intermediary, uses a mobile platform to provide insurance to developing markets, automatically deducting premiums from prepaid airtime credit and paying out claims within 72 hours.<sup>42</sup></li> <li>• Amwins, a wholesale broker, offers a "Shake and Pay" parametric earthquake insurance product, with an online platform that can provide affordable coverage to Californians in minutes.<sup>43</sup></li> </ul>
 <b>Portfolio Management</b>	<b>Direct investments in resilience</b> Reduces likelihood of future losses via investment in structural improvements, more resilient infrastructure, or nature-based solutions	Through investments in nature-based solutions, insurers can support projects taking place in their market to build community resilience (see case study below for more detail).
	<b>Support of resilience projects through the carbon market</b> Provides funds and backing for resilience projects	Insurers can buy carbon credits that fund resilience projects. They can also provide coverage for purchasers or producers of carbon offset projects, which supports the feasibility of nature-based solutions and expands the carbon offset market (see case study below for more detail).
	<b>Insurance-linked securities</b> Leverages catastrophe bonds and resilience/green bonds to transfer risks, diversify portfolios, and fund resilience projects and products	<ul style="list-style-type: none"> <li>• New York City's Metropolitan Transportation Authority (MTA) covered its infrastructure by issuing parametric catastrophe bonds after Hurricane Sandy, which distributes payouts if a storm surge floods subways.<sup>44</sup></li> <li>• Green bonds and resilience bonds have been integrated into the investment strategies of major insurers to support sustainable infrastructure and risk mitigation initiatives.</li> </ul>

Source: Oliver Wyman analysis

The case studies below highlight ways that insurers have used a combination of product refinement, new distribution mechanisms, and portfolio management to create new commercial opportunities.



## Infrastructure

Insuring and investing in infrastructure presents a large opportunity to reduce the impacts of disasters, increase resilience, and support the continued delivery of emergency services during crises. However, there has historically been under investment and underinsurance of assets such as public transportation, electric utilities, and hospitals. The Sendai Framework, which is endorsed by the UN as the first major agreement for development and disaster risk reduction, outlines a target “to substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities.”<sup>45</sup>

To reduce the disruption of services, insurers can encourage more widespread adoption of infrastructure insurance. Parametric products, which provide quick payouts to policyholders and enable more efficient recovery, have been used to successfully insure hospitals during pandemics and can be used in a similar way to insure hospitals against weather-related disasters. Insurers can

also support building more resilient infrastructure, specifically in developing economies, with credit insurance. As highlighted in the above table, the Asian Development Bank (ADB) and the International Finance Corporation (IFC) reached agreements in 2022 and 2023, respectively, with several global insurers to increase credit insurance for critical infrastructure.<sup>46, 47</sup>

On the portfolio management side, catastrophe (CAT) bonds can be issued to fund infrastructure improvements post disaster. For example, the Metropolitan Transportation Authority (MTA) issued a CAT bond to invest in resilience of transportation after Hurricane Sandy. The MTA has since renewed the bond three times, which operates based on parametric storm and earthquake triggers.<sup>48</sup> Insurers can also directly invest in infrastructure to improve its likelihood of withstanding disaster. For example, the Insurance Development Fund (IDF), World Bank, and the United Nations (UN) are currently partnering to develop an infrastructure fund to support investments in resilient infrastructures in developing economies.<sup>49</sup>



## Agriculture

Crop insurance is vital to stabilize supply chains and improve the livelihoods of farmers, who are particularly vulnerable to climate-related risks. Globally, one in four people works in agriculture, and farmers make up most of the workforce in many developing countries.<sup>50</sup>

Yet 60% of insurable crop production globally was unprotected in 2022, representing a \$113 billion crop protection gap.<sup>51</sup> In Mexico, agriculture constituted more than 80% of total economic losses from weather-related disasters over the last two decades.<sup>52</sup>

The insurance industry has an opportunity to protect farmers, as well as the world population that relies on crop production, while incentivizing climate-smart agriculture to provide more resilience to farms. Insurers can tap into new products and distribution methods and work with private and public partners to increase coverage of agriculture. For instance, Blue Marble, a microinsurance provider, increased the coverage and resilience of coffee production via the distribution of a parametric product to coffee

farmers through its partnership with Nespresso, a private company, as well as government bodies.<sup>53</sup>

<sup>54</sup> In addition, Swiss Re launched a weather-index coverage program for smallholder white-maize farmers in Mexico in partnership with the Insurance Development Forum, Mexico's Ministry of Finance, and state-owned re-insurer Agroasemex, covering against excessive rainfall, droughts, and other natural disasters through a parametric policy.<sup>55</sup>



## Nature-based solutions

Nature-based solutions (NBS) are investments that protect natural ecosystems and build resilience against climate change. Natural ecosystems such as coral reefs, mangroves, and salt marshes reduce the severity of climate disasters, capture greenhouse gases, and provide other socioecological benefits. NBS can provide more than 30% of the climate mitigation needed to limit global warming to the 2015 Paris Agreement targets, given that these assets are between five times and ten times more effective than human-engineered solutions.<sup>56, 57</sup> By investing in these solutions in areas where they are also active in providing cover, insurers can not only create a positive impact on total emissions, they can also reduce risk over time for themselves and other insurers. This creates a positive feedback loop that reduces long-term costs and enables the industry to maintain or expand coverage.<sup>58</sup> This is an example of a shift in thinking — breaking down business silos and focusing on prevention and resilience as much as post-event cash transfer — that can reduce payouts over the long run and protect ecosystems that provide long-term resilience.

### **Incorporate nature-based solutions in risk modeling and data**

To increase the focus on NBS, risk modeling and data need to be expanded. By measuring the

quantitative benefits of NBS and incorporating this into risk models, insurers can identify where NBS solutions will enhance product offerings, pricing, and investments. One study found that investment in coral reef protection could be recovered from premium savings in the first five years.<sup>59</sup> Once the long-term benefits of NBS are more defined and incorporated into the data and models, insurers can capitalize more widely on NBS opportunities to both invest and insure.

### **Expand insurance of nature-based solutions**

Insurers can directly cover ecosystems in collaboration with communities, governments, and non-governmental organizations (NGOs). This provides an opportunity to expand private insurance business, while receiving the benefits from resilience. In Mesoamerica, insurers have collaborated with the public sector to underwrite parametric policies and insure coral reefs against hurricanes. Swiss Re, The Nature Conservancy, and regional Mexican government insured the Quintana Roo coral reef through parametric insurance.<sup>60</sup> The MAR Fund also created parametric insurance products for several countries in the region: After Hurricane Lisa in November 2022, the first payout helped fund restoration of the affected area in Belize.<sup>61</sup> These insurance policies help protect natural assets and create funds for repair after disasters.

Insurers can also provide policies for projects that may protect a natural asset. For example, Swiss Re supported a Construction All Risks (CAR) policy to create a sand dyke in the Netherlands to protect an island labeled as a World Heritage Site.<sup>62</sup> This applied traditional insurance to an innovative project that supports NBS.

Nature-based solutions do not just provide ecosystem services — they can also be sites for tourism and other income. Businesses and communities can use revenue from ecosystems to buy insurance for extreme weather that might cause ecosystems like national parks, beaches, and coral reefs to close to visitors, resulting in lost revenue. This enables insurers to apply traditional insurance policies to new situations.

### **Investing in nature-based solutions**

Insurance companies can take advantage of investing in NBS implementation to diversify their portfolios and reduce risk of their policies, while earning attractive risk-adjusted returns, for example, through the monetization of attaching carbon credits. One survey of insurers found that insurers can fund NBS through green, resilience, and CAT bonds.<sup>63</sup> These bonds help raise capital for NBS projects and provide financial returns to insurers.

Insurers can also donate money to local initiatives that increase resilience. Fifteen Canadian insurance companies developed the Nature Force and invested in watershed resiliency through natural infrastructure by partnering with the nonprofit Ducks Unlimited. Whether it's through issuing bonds or providing philanthropy to NBS, this helps reduce the severity of climate-related disasters, lowers overall risk, and allows insurers to maintain or expand current coverage.

### **HARNESSING CO-BENEFITS OF INCREASING RESILIENCE AND SUPPORTING CARBON REMOVAL**

In addition to direct investments in resilience, insurers can also indirectly encourage resilience through the voluntary carbon market (VCM). Carbon credits or offsets, which are traded in the VCM, represent one metric ton of carbon dioxide or another greenhouse gas that has been removed, reduced, or avoided. These are often bought by businesses to offset their own CO2 emissions. These offsets are often derived from dedicated removal projects such as a reforestation effort or mangrove restitution.

The VCM funds nature-based solutions and other projects that can build community resilience. However, the carbon market faces several challenges, including a lack of regulatory support, incomplete performance data, and credibility concerns. The insurance sector's risk expertise can provide greater certainty around delivery and accuracy of carbon credits, therefore driving market growth.

#### **1. Expand insurance product offerings to cover carbon offsets against fraud, mismanagement, or damage**

Insurers can cover non-delivery or reversal of carbon stocks, including losses from regulators invalidating offsets, project mismanagement, fraud, or unexpected changes. Additionally, insurers can provide policies to ecosystem projects to protect losses from natural disasters and other failures. By insuring carbon offsets, insurers make resilience projects more feasible.

#### **2. Use risk assessment expertise and tools to help develop voluntary carbon market standards, reliability, and integrity**

The insurance industry is well-positioned to standardize offsets by improving transparency and credit quality. They can do this by assessing carbon project risks to identify projects that manage and mitigate risks better, providing smaller-scale suppliers with access to nature-based carbon credits in conjunction with insurance, and creating tools to improve legitimacy of the VCM. By building these insurance capabilities for nature-based offsets in carbon markets, insurers can improve offset pricing, allocate risk-bearing capacity, grow the market, and scale carbon project access.



## RECOMMENDATION 2

### Collaborate with the public sector to expand insurance coverage

#### COMMERCIAL BENEFIT OF THIS RECOMMENDATION

Partnering with the public sector, including government bodies, non-profits, or other community organizations, allows insurers to cover new markets and increase revenue in areas where private insurance on its own may be unaffordable or challenging to distribute at scale. Partnerships can also protect existing insurance markets and revenues in light of increasing climate-related risks by utilizing public sector funding and encouraging risk mitigation and risk diversification to keep coverage affordable.

Designed well, public-private partnerships can help extend insurance cover to vulnerable, underserved communities. These partnerships are likely to become an increasingly important part of the insurance toolkit as climate change increases risk accumulations and the cost of cover in high-risk areas, and the evidence shows that such partnerships can deliver higher levels of insurance penetration among the general population than with private markets alone.<sup>64</sup>

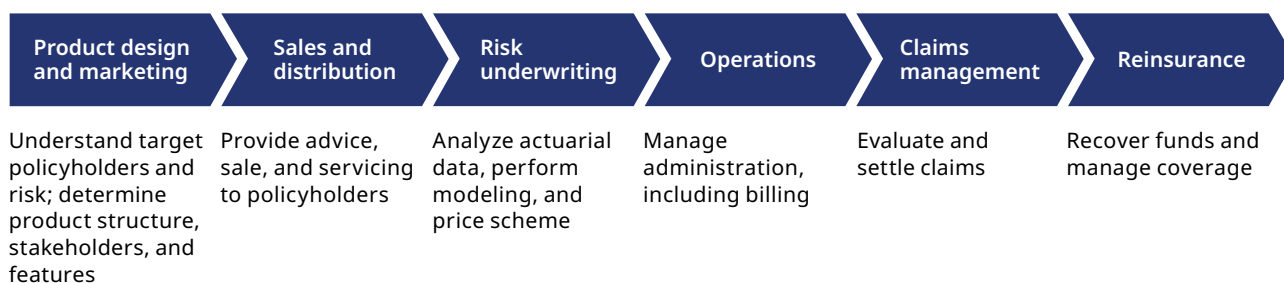
For insurers, public-private partnerships can provide access to underserved communities and protect existing markets from climate-driven premium inflation. For governments, these

partnerships provide much needed private capital for vulnerable communities and prevent a spiral of increasing inequality in which poorer communities face greater disaster costs. More broadly, these partnerships address the challenge of relying on government intervention post disaster, contribute to overall speed and extent of economic resilience and recovery, and help reduce fraud and leakage from government post-disaster relief schemes.

Public-private partnerships vary in size, ranging in scale from sovereign risk pools — where national governments pool catastrophe risks for the private sector to transfer to reinsurance markets — to national, regional, and community-based schemes. They also come in many different forms. Public and private actors can take different roles along the insurance value chain as illustrated in Exhibit 7, depending on the specific requirements of the scheme.

As the need for collaboration increases, insurance brokers can also play an important role in working with communities, private insurers, and governments to aggregate demand and create products at scale. Brokers are well-positioned to identify best practice approaches and create repeatable adaptation and resilience schemes that can be implemented and adapted across different regions.

#### Exhibit 7: Insurance value chain



Source: Oliver Wyman analysis

## Design principles for public-private partnerships

Getting the design of public-private partnerships right is vital. Poorly designed partnerships can result in high operating costs, muted price signals that fail to optimally incentivize risk reduction, crowding out of private insurance, and the poor allocation of risks or unsustainable contingent liabilities on the public balance sheet.

The following principles ensure public-private partnerships effectively expand insurance, remain sustainable in the long-term, and employ equitable practices.

### 1. Maximize the role of private insurance.

Maximizing private insurance reduces contingent liabilities placed on the public balance sheet, ensures the expertise of the private insurance market is brought to bear on risk assessment and mitigation, enables risk-based pricing, and utilizes the insurance industry's fraud prevention and claims payments capabilities. The public sector can still have a role in providing contingent funding, risk capital to reduce costs for vulnerable communities, or supporting equitable pricing and access to insurance. However, approaches should be designed carefully to ensure subsidies do not extend to those who can afford risk-based premiums in the private market — unless that is an explicit objective of these partnerships.

### 2. Strike a balance between risk-based pricing and affordability and access.

Subsidizing insurance can help extend cover to vulnerable populations but may lead to unintended behavioral consequences. Muted pricing signals may reduce incentives to invest in resilience or contribute to high-risk activities such as building in flood plains, which can increase the cost of risk over the long term. Cross-subsidies from one customer segment to another should also be avoided for the same reason. In many countries, subsidy costs will rise as a result of climate change and population growth, but withdrawing subsidies

may be politically difficult, especially where the gap between market prices and subsidized prices is high. Governments need to understand the fiscal implications of public-private partnerships under plausible demographic and climate scenarios from the outset.

### 3. Build public-private partnerships around the expertise of each entity.

Different public and private entities have different risk bearing capacities, risk appetites, distribution networks, and technical expertise. Private insurers are often best placed to underwrite risks and distribute and service policies in areas with already high insurance penetration. Governments may be better suited to carrying less-well-understood risks or supporting mechanisms such as back stops or blended finance to improve affordability for vulnerable communities.

#### IDF, UNDP, AND BMZ TRIPARTITE PROGRAM<sup>65</sup>

The Tripartite Program is a public-private partnership between the United Nations Development Program (UNDP), the German Federal Ministry for Economic Cooperation and Development (BMZ), and the Insurance Development Forum (IDF). Since 2019, the partnership has worked with governments and other sub-national entities around the world to expand insurance coverage and resilience through 22 projects in climate-vulnerable countries. Examples of projects include a \$50 million flood parametric program in Ghana, a \$100 million drought parametric program in Mexico, and a \$50 million urban flooding program in Lagos, Nigeria.

The Tripartite Program is an example of using the public-private partnership model for innovation and experimentation — public-private partnerships do not have to be confined to traditional risk transfer. For the program to be successful, it has relied on each entity's unique technical expertise and risk capabilities. For instance, the UNDP provides country-level change through engaging countries, supporting regulations, integrating solutions, and providing project management support. BMZ mobilizes financial support through co-financing with the private sector and structures programs. The IDF members deliver technical support (including risk modeling), risk transfer solutions, additional financing, and risk capacity.

**4. Incorporate resilience measures into insurance policies.**

To be economically sustainable in the face of climate change, public-private partnerships must find ways to build resilience among high-risk populations. Examples include premium discounts for risk mitigating efforts, grants or loans to support risk mitigation, or investments in nature-based solutions and other physical resilience-building infrastructures. Not all risk mitigation results in the same benefit — depending on the specific peril, risk mitigation may result in a smaller or larger reduction in loss over time. Governments should consider different returns on mitigation when forming these partnerships, specifically in multi-peril countries.

**5. Maximize diversification and uptake.**

Public-private partnerships designed to increase affordability and extend insurance coverage should seek to pool risks over large areas and across high and low-risk policyholders to maximize diversification. Ways to do so include multi-peril schemes, national and transnational pools, and partnerships that serve both high-risk and low-risk policyholders.

### **Selected case studies**

We illustrate the range of objectives and designs across insurance-related public-private partnerships with the following three successful examples:






The first example is Flood Re, a national UK government and private insurance industry collaboration that provides a reinsurance scheme for insurers that offer flood coverage. It was created in 2016 as a temporary 25-year solution to address a market failure triggered by the withdrawal of insurers from the UK home insurance market.<sup>66</sup>

A second example is the California Earthquake Authority (CEA), which developed a Wildfire Fund in 2019 with the goal of lowering the risk of and damages from utility-caused fires. The Fund reimburses three large utility companies for liabilities post-wildfire damage.<sup>67</sup>

The Kenya Livestock Insurance Program (KLIP) is the final example. The KLIP is a collaboration launched in 2015 between the government of Kenya and local insurers that is geared to help small farmers deal with the loss of livestock in the face of drought. The program currently pays out premiums for up to five animals.<sup>68</sup>

Exhibit 8 describes how these public-private programs are designed across the across the above principles.

## Exhibit 8: Examples of how existing partnerships are designed across the above principles

	Flood Re <sup>69, 70, 71, 72</sup>	California Wildfire Fund (CEA) <sup>73, 74, 75, 76</sup>	Kenya Livestock Insurance Program (KLIP) <sup>77, 78, 79</sup>
<b>DESIGN PRINCIPLES</b>			
 <p><b>Maximize role of private insurance</b></p>	The government developed the scheme. It provides some oversight but no official backstop. Flood Re allows the private sector to continue operations directly with policyholders as usual, with the public sector operating in the background.	California Earthquake Authority (CEA) administers the California Wildfire Fund. The state of California's Surplus Money Investment Fund (SMIF) provided an upfront loan for the fund. Guy Carpenter was selected to provide reinsurance and risk transfer advisory services.	The government developed the program and provides oversight; Seven local insurers and one reinsurer distribute scheme and handle claims. The scheme-created protocols identify vulnerable households that qualify for subsidized coverage.
 <p><b>Strike a balance between risk-based pricing and affordability</b></p>	The scheme currently emphasizes affordability, with policyholders paying premiums based on tax bands. Subsidization is funded by a levy that insurers pass onto policyholders as part of their policies. However, Flood Re was created as a temporary solution set to expire in 2039, and insurance will aim to return to risk-based pricing.	Utilities contribute different amounts to the fund depending on a variety of risk-based factors, including the number of people served and the proportion of the utility in high fire-threat districts. The CEA's Director of Finance determines allocation amounts for each utility and can adjust based on any mitigation measures. These contributions make up 50% of the fund; the State of California contributes the other 50% through a utility tax from a water bond.	Although KLIP currently subsidizes premiums, it will transition to fewer subsidies in phase two of the program, where policyholders will pay an increasing share of the commercial cost of insurance.
 <p><b>Build partnerships around the expertise of each entity</b></p>	Private insurers and the government collaborated to create the scheme. Flood Re is accountable to the Secretary of State. Private insurers handle individual underwriting and claims as well as all communications with policyholders and brokers.	Experts from Filsinger Energy Partners and Guy Carpenter support pricing. Sedgwick Claims Management Services assists with claims.	The World Bank assisted with technical assistance. The program relies on the local insurers for risk information and access to distribution networks.
 <p><b>Incorporate resilience measures into insurance policies</b></p>	Flood Re educates policyholders on "flood smart" measures and reimburses "build back better" investments up to £10,000. There is an emphasis on resilience to drive down overall risk and return to risk-based pricing in 2039.	Each corporation is required to invest \$5 billion in mitigation activities and upgrades across infrastructure and safety.	The World Bank also approved the Kenya Climate Smart Agriculture Project (KCSAP) to support the governments investment in resilient public goods through agriculture.
 <p><b>Maximize diversification and uptake</b></p>	Insurers cover all properties, including those not in high-risk flood zones. This allows insurers to cross-subsidize higher-risk and lower risk-property premiums.	Because this partnership is focused on three utility companies within California only, there is less opportunity to diversify risk. However, the fund diversifies risk through global reinsurance at its onset in 2019. Additionally, by providing assistance for wildfire recovery, the CEA allows private insurers to better support recovery from other perils.	The KLIP focuses on drought in a specific region, limiting the opportunity to diversify risk.



## RECOMMENDATION 3

### Improve accuracy and availability of climate-related data and analytics

#### COMMERCIAL BENEFIT OF THIS RECOMMENDATION

Improving data and analytics allows insurers to more accurately price risk and expand coverage to new markets and products where data is traditionally lacking, leading to increased revenues. Ensuring that models can incorporate resilience efforts will also enable insurers to quantify risk reduction efforts, averted losses, and co-benefits.

Insurers have a strong incentive to better understand climate change's impact on the data upon which they base their pricing and coverage. The ability of insurers to assess and underwrite risk has been complicated by the hard-to-assess changes in the assumptions about the likelihood and severity of natural catastrophes. Insurers struggle with the lack of necessary data and information and uncertainty about what is driving underlying risk distribution changes. There is a need for more forward-looking, "climate-conditioned" modeling capabilities to assess risks over the short and midterm. Understanding the impacts of rapidly changing risks not only reduces the necessary "uncertainty premium" built into pricing and reserving, it is also critical for the insurance industry to support adaptation and resilience.

#### Data sharing through utilities and open data

##### Investment in data-sharing utilities will support the resilience of individuals and assets

Access to high-quality data is crucial for insurers to make well-informed decisions, as it directly impacts the accuracy of pricing and planning, and the amount and level of coverage they can provide to individuals, communities, and commercial enterprises. By improving data, insurers can enhance the precision of risk analytics and strengthen the insurance sector's ability to support and enhance resilience efforts and drive adaptation.

Data-sharing utilities or open data can expand data availability, widening the collective information available to an individual insurer or broker.

Addressing information silos and fostering a more comprehensive understanding of risk enables insurers to develop more robust insights through more informed models and analytics. Additionally, data sharing can support the development of new products and schemes that enhance adaptation and resilience, such as parametric policies. Enhanced understanding of exposure helps to safeguard insurers and risk owners from economic losses, given that patterns of risk accumulation change over time. This is particularly crucial in regions where data availability is limited.

Data utilities, including partnerships, marketplaces, and trusts, are increasingly gaining traction within insurance ecosystems, with different initiatives emerging to bridge information gaps and achieve collective goals in multiple sectors (see Exhibit 9). These platforms aim to enhance data collection and access by promoting collaboration, co-development, and the use of data standards, providing stakeholders with broader access to data and/or models compared to proprietary platforms or individual vendors. The success of opensource platforms in the industry also relies on the crucial support and engagement from major modeling vendors and insurance corporations.

The Insurance Development Forum (IDF) has produced a substantial amount of research on opensource platforms and their success in expanding risk analytics capabilities to climate-vulnerable communities. The IDF's Global Resilience Index Initiative (GRII), to be launched at COP28, aims to develop a common risk data architecture and provide reference data to improve understanding of climate risks, supporting climate resilience finance in both emerging and developed markets.<sup>80, 81</sup> Further, the IDF Risk Modeling Steering Group (RMSG) has developed initiatives, such as the Global Risk Modeling Alliance, which provides open data and modeling technology like the Oasis Loss Modeling Framework (see Exhibit 9) to support risk analytics development in participating countries.<sup>82</sup>

##### Improving information granularity will produce more accurate risk assessments

Accessing exposure and vulnerability information is one of the key challenges that hinders insurers' ability to effectively price and provide coverage

for risks. Data availability and accuracy can vary, integration of information from different sources can be difficult, and often the sensitivity of this information can require additional time and technological infrastructure to securely incorporate this information. However, primary property characteristics, secondary modifiers, and mitigation investments can significantly influence risk outcomes.

Foundational information produces a base modeled loss calculation and includes the location of the risk

and primary characteristics such as construction type and year, number of stories, and square footage. Secondary modifiers such as the roof envelope and cladding type, proximity to other structures, and any mitigation or resilient investments implemented may be critical for accurate risk assessment. Both primary and secondary characteristics may be fragmented and isolated within and between stakeholders in the insurance ecosystem. Data utilities can play a vital role in enhancing the availability, exhaustiveness, and precision of necessary data.

## Exhibit 9: Examples of Data Utilities and Opensource Software Platforms

<b>OASIS HUB AND OASIS LOSS MODELING FRAMEWORK<sup>83</sup></b>	<ul style="list-style-type: none"> <li>Oasis Hub is a non-profit digital platform that aggregates and standardizes global datasets on natural catastrophes, extreme weather, climate change, and other environmental risks. It includes the Oasis Loss Modeling Framework (LMF), an open-source platform for developing and deploying catastrophe models, and the Climate Change Risk Explorer (CCRE), which provides access to climate change data.</li> </ul>
<b>Stakeholders:</b> Catastrophe (re)insurance industry; modeling vendors; research organizations; governments	<ul style="list-style-type: none"> <li>A steering committee of 16 major insurers or insurer-led organizations guides the development of Open Data Standards (ODS) requirements under which Oasis operates.</li> <li>Oasis LMF was used to develop risk models in Bangladesh and the Philippines, where insurance uptake is less than 1% in both locations, through a 2-year project initiated by the German government's International Climate Initiative. The project involves collaboration with national scientific agencies and academic organizations, creating capacity for private insurers to enter the market and eventually own risk assessment and management in the long term.<sup>84, 85</sup></li> </ul>
<b>CLIMADA</b>  <b>Stakeholders:</b> Catastrophe (re)insurance industry; global risk owners	<ul style="list-style-type: none"> <li>The success of CLIMADA, an open core risk modeling software platform, exemplifies the potential benefits of evaluating mitigation measures through models. The system operates under the Economics of Climate Adaptation (ECA) framework to provide concrete recommendations for clients to address climate-related risks over various time horizons.<sup>86</sup></li> <li>In partnership with Swiss Re, CLIMADA helped the San Salvador municipal government prioritize flood, tropical storm, and landslide adaptation investments by ranking potential projects and quantifying the estimated losses they would prevent.<sup>87</sup> The study resulted in the strengthening of the ecosystem through reforestation and terracing efforts.<sup>88</sup></li> </ul>
<b>OPENQUAKE AND THE GLOBAL EARTHQUAKE MODEL (GEM) FOUNDATION</b>  <b>Stakeholders:</b> Industry participants; modeling vendors; research organizations; governments	<ul style="list-style-type: none"> <li>Operated by GEM, OpenQuake is an opensource platform for scenario and probabilistic hazard risk assessments and includes modeling capabilities for any spatially varying hazards.<sup>89</sup></li> <li>In 2016, OpenQuake and Air Worldwide collaborated on a project (sponsored by the World Bank) with local experts in the Republic of Armenia to develop a national earthquake hazard model and seismic zonation maps, used to update national building codes and provide analytics to inform the country's risk financing strategy.<sup>90</sup></li> <li>Similar platforms can be developed for climate-related hazards.</li> </ul>

Source: Oliver Wyman analysis

## Challenges and considerations

The successful adoption of data utilities relies on trust and participation from data contributors, ensuring that the shared pool of data benefits all stakeholders rather than serving the interests of a single firm seeking a competitive advantage. At the same time,

private insurers and other actors should have their commercial interests protected, for example if they have invested resources in building a data advantage over many years. Utility development also requires careful consideration of factors such as oversight,

the number of involved actors, privacy and security measures, and the necessary infrastructure and technical capabilities.

Standardization is also critical in integrating collected data, especially when global stakeholders contribute to exposure databases. Establishing standard terminology, definitions, and consistent requirements for data classification and management unlocks the full market potential of data utilities in the industry.

### **Forward-looking models that account for different climate scenarios and timescales**

Despite recent advances in analytical and technological capabilities, a significant gap remains in fully incorporating climate-driven risks into catastrophe models. Failure to understand and integrate the impacts of climate change into catastrophe models can expose insurers to financial risks and limit their ability to manage climate-related risks, allocate capital effectively, and communicate risk information to communities and stakeholders.

Current “climate-conditioned” catastrophe models have limitations. Most adjust the frequency and severity of events based on historical data, which precludes the inclusion of new events possible in different climate scenarios. Being largely statistical rather than driver-based models, these adjustments often fail to capture the complex and dynamic changes associated with catastrophe events. Moreover, they often lack the ability to incorporate mitigation and resilience measures, resulting in distorted vulnerability risk information.<sup>91</sup>

Modeling the impacts of climate change on weather-related perils has emerged as a critical focus for industry stakeholders and researchers alike. In the US, the National Oceanic and Atmospheric Administration (NOAA) and the National Science Foundation (NSF) are collaborating to establish an Industry-University Cooperative Research Center that aims to develop innovative models that seamlessly integrate climate projections into catastrophe models. By doing so, it seeks to improve the accuracy of the insurance sector’s risk assessments and bolster its capacity to manage and mitigate climate-related risks.<sup>92</sup>

It will be difficult to resolve these issues and facilitate a more accurate assessment of climate change risks and possibilities with current modeling approaches; new modeling methods must be adopted. The below three priorities can support more climate-ready models:

#### **1. Simulate events at climate-relevant timescales.**

By utilizing new event sets simulated from the latest climate models and modeling these across extended time horizons, more robust and forward-looking baseline datasets can be established. This enables accurate pricing for typical policy periods of 12 months, informs medium-term portfolio management decisions, and can shape the long-term firm strategy for the coming years and decades. Additionally, models that incorporate changes in vulnerability risk, specifically risk reduction and resilience measures, produce more accurate views of risk and can incentivize further investment in resilience and adaptation through risk-reflected pricing.

#### **2. Support scenario analysis and stress tests of different climate pathways.**

Scenario analyses and stress tests, commonly identified by the IPCC’s Representative Concentration Pathways, must be conducted within and across models to provide a comprehensive view of the spread of risk under different climatic conditions and the corresponding implications for their portfolios. Adaptation and resilience building efforts need to be more accurately included in climate scenario analysis and stress testing. This brings to the fore the value from resilience-building efforts across scenarios and facilitates a strategic approach to incorporating resilience into portfolio steering.

#### **3. Incorporate the impact of secondary perils.**

Secondary perils such as severe convective storms, flash floods, drought, and wildfire, are highly climate-sensitive and increasingly impactful.<sup>93, 94</sup> In accordance with wider risk distributions, secondary perils accounted for 43% of natural catastrophe insured losses in 2022.<sup>95</sup> These risks must be a key focus of modeling capabilities in current and future development cycles.

## RECOMMENDATION 4

### Create an industry standard around “build back better”

#### COMMERCIAL BENEFIT OF THIS RECOMMENDATION

Ensuring that buildings are better able to withstand weather-related disasters can significantly reduce future financial losses and claims payouts. This makes the price of coverage more affordable for policyholders and keeps risk at a level where insurance can remain available and insurers can remain active in markets, despite increasing disaster frequency.

“Build Back Better” (BBB) is defined by the United Nations Office for Disaster Risk Reduction as “the use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies, and the environment.” BBB’s goal is to enable communities to better manage future disaster risks by improving the reconstruction process — through ensuring new development is located outside of high-risk areas and requiring that buildings and infrastructure can structurally better endure disasters such as flooding, earthquakes, and fires.<sup>96</sup> BBB has additionally been used to drive the use of more sustainable materials in the rebuilding process, embedding a resilience mindset and minimizing the carbon footprint of rebuilding.

The benefits of taking the resilience of buildings and infrastructure into account are indisputable. BBB increases resilience to future disasters and reduces the potential for future losses by focusing explicitly on risk reduction throughout the rebuilding process. Without a focus on resilient construction, communities and regions may suffer further from avoidable damage and loss of life. With the 2004 Indian Ocean Tsunami, 2005 Kashmir Earthquake in Pakistan, and the 2009 Samoan Tsunami, the degree of damage and loss of life could have been reduced if there had been greater consideration of risks

during the design and construction of buildings and infrastructure.<sup>97</sup> These are only a handful of select examples — this theme is apparent and repeatable across disasters throughout the 2000s.

Data has also shown that stronger buildings and infrastructure significantly reduce financial losses and costs from natural disasters. For example, 51% of homes built after 2008 survived undamaged after California’s 2018 Camp Fire wildfire, the deadliest and most destructive in the state’s history. That compares with 18% of homes built pre-2008 under less-stringent building codes.<sup>98</sup>

An analysis by the World Bank suggests that if all countries were to adopt BBB practices over the next 20 years, global losses from disaster would be reduced by 12%, or \$65 billion a year. This reduction is most noticeable in some developing economies, where the resulting loss reduction could be over 40%.<sup>99</sup>

Given the significant savings and increase in resilience that can come from building back better, not to mention the reduction in injuries and fatalities, it is understandable that there has been an increased focus on this idea over the past two decades.

#### Obstacles to build back better

Many existing efforts are led by the public sector with a heavy burden on public funding, and do not involve private insurers. As stated in the barriers section of this report, there is a lack of public emphasis on resilient construction, and programs like FEMA and the NFIP in the United States tend to allocate the majority of funding towards post-disaster activities that do not support resilience, such as rebuilding to the same standards and in the same high-risk locations.<sup>100, 101</sup> Insurers are typically not involved early enough in planning and reconstruction to meaningfully support BBB initiatives. In addition, insurers face difficulties fully implementing BBB with their current policy structures and wordings, and incorporating benefits of resilience into underwriting.

BBB is particularly relevant to insurers given their position in funding recovery. The Global Federation of Insurance Association recommends that, for recurring disasters to be avoided, “identical reconstruction after a natural disaster should not be the default.”<sup>102</sup> While insurers have done a lot of thinking on this topic, BBB’s execution remains siloed across the industry and lacks a consistent standard. This raises a further impediment to insurers adoption of BBB measures on an individual basis, namely that the future benefits by way of reduced incidence and severity of losses may not accrue to the sponsoring insurer. Because insurance is overwhelmingly a 12-month cover, customers who have benefited from BBB in the claims processes of one insurer are free to switch to another insurer at any time. This moral hazard is best addressed by a combination of industry-wide adoption of a BBB standard, and incorporating fully risk-reflective pricing so that the sponsoring insurer can price to reflect their better understanding of the reduced risk exposure.

### **Next steps for the insurance industry**

The resilience of buildings and infrastructure to withstand disasters, the standards associated with new developments, and the location of new developments are directly related to the degree of damage and severity of losses for insurers.

Over time, this impacts the level of risk across regions, and subsequently the price of premiums and the affordability of coverage. BBB is one tool that will enable insurers to remain in more resilient markets and continue to provide coverage over the long-term.

Insurers have an opportunity to play a larger role in making BBB the industry standard — enabling the private insurance market to collectively benefit from resilience measures and reduced risk. It should also be noted that insurer involvement can and should go beyond post-disaster reconstruction to incentivize structural improvements before disaster strikes, preventing damages and losses from occurring in the first place. The changes that need to be made for insurers to support BBB differ depending on whether the scope is commercial insurance, critical infrastructure coverage, small and midsize enterprises (SMEs), or individual households. Exhibit 10 below provides an overview of what insurers can do to address each of these areas.

## Exhibit 10: How insurers can play a larger role in BBB

POTENTIAL ACTIONS FOR INSURERS	1	2	3
	Make changes to existing insurance policies and reinstatement clauses to support BBB	Provide premium reductions to incentivize policyholders to take risk mitigation measures, serving the dual benefit of reducing risk of loss for the insurance company and making insurance more affordable for the policyholder	Work with the public sector to provide funding to support structural improvements or relocation, potentially in exchange for reduced premiums
Example(s)	<ul style="list-style-type: none"> <li>Insurers can remove the “same location” clause in their policies to allow for potential relocation out of high-risk areas to reduce risk of potential loss</li> <li>While there is currently a reinstatement clause available to support BBB for commercial policyholders in some markets, this clause can be refined to encourage more widespread use across insurance brokers</li> </ul>	<ul style="list-style-type: none"> <li>Insurance companies in Germany, the Netherlands, and Barbados have incentivized policyholders in high-risk areas to implement customized risk reduction changes to their houses, such as installing water-resistant floors, and installing electrical equipment on a higher floor<sup>103</sup></li> </ul>	<ul style="list-style-type: none"> <li>Flood Re reimburses up to £10,000 for policyholders to install property flood resilience measures when repairing their properties after a flood<sup>104</sup></li> <li>State governments of Alabama and Louisiana provide grants of up to \$10,000 to homeowners to make structural improvements to their roofs, in exchange for private insurers providing premium reductions<sup>105</sup></li> <li>The NFIP is proposing a buyout and relocation program for severe repetitive loss properties, which enables homeowners to enroll in a guaranteed buyout of their home prior to a flood<sup>106</sup></li> </ul>
External stakeholder involvement	None	None	Public sector support required
Scope	Commercial insurance; critical infrastructure; households; SMEs	Households; SMEs	Households; SMEs

Source: Oliver Wyman analysis

### Enablers to build back better

As detailed in Recommendation 3, an increased focus on forward-looking risk modeling enables insurers to analyze the benefits and longer-term cost savings associated with BBB initiatives. This will facilitate a more standardized, widespread approach to pricing resilience and risk mitigating efforts and ability to tie these efforts to premium reductions.

Insurers’ BBB efforts cannot occur in a vacuum. Regulators must strengthen building codes and improve risk-based land-use planning to incentivize effective insurance BBB policies. Similarly, tax

incentives that reflect the shared interests of government and insurers to implement BBB provisions would further bolster insurers’ efforts. This requires increased coordination with the public sector and industry-level influence on public policies. Insurers will also need to be involved earlier in the development process and coordinate across different stakeholders such as developers and the construction industry to ensure BBB is integrated with overall planning and new development, and that pricing signals are appropriately incorporated. See Recommendation 5 for additional detail.



## RECOMMENDATION 5

### Advocate for public policies and regulations that support resilience

#### COMMERCIAL BENEFIT OF THIS RECOMMENDATION

Advocating for improved public policies and regulations is an imperative for insurers to capture the commercial opportunities across the above recommendations. By influencing regulations, insurers can expand existing coverage to new markets, utilize new products, and increase revenues. By advocating for public policies that better support pre-disaster risk mitigation and resilience, insurers can reduce future losses, protect existing markets, and open up new markets for insurance coverage.

As discussed in the barriers section of this report, public policies and regulations can either help or hinder resilience. At a macro-, meso-, and micro-level, regulations can prevent insurers from utilizing the full breadth of their capabilities to transfer risk more effectively and help communities recover more quickly from disaster.

At the same time, the ability for insurers to continue transferring risks and remain active in markets relies on maintaining a manageable level of risk exposure through the prevention or reduction of future losses. Insurers are well suited to use their risk information and expertise to inform and influence policy decisions that support risk reduction. This includes influencing improved building code standards, strategic land-use planning, and investments in nature-based solutions or other protective infrastructure.

Advocating for more effective risk transfer and shifting public focus towards risk reduction will require increased collaboration with government bodies and regulators.

#### Influencing land-use planning, building code standards, and other strategic risk-based planning decisions

Without an integrated focus on land-use planning, building code improvement, and other strategic risk-based decisions, efforts to build new structures

or rebuild post-disaster can fall short and result in development in high-risk areas and of haphazard structures. Over time, this increases loss and damages from disaster and makes recovery more difficult. A comprehensive focus on planning becomes increasingly important, now more than ever, as a significant portion of the global population is exposed to the increasing risks of climate-related disasters due to urbanization. For example, the number of people expected to be exposed to tropical cyclones and earthquakes in large cities will more than double by 2050.<sup>107</sup> Ensuring that communities are developed with risk in mind will reduce impact from future disasters, increase resilience, and contain the expansion of new risks to allow the insurance industry to play a larger role in recovery.

Given risk data is a core part of the insurance business model, insurers are well positioned to influence, advocate for, and support risk-based planning and decision-making in both urban and rural areas. For insurers, this means getting involved much earlier and to a greater degree in planning with the public sector. If insurers prioritize risk communication early on, including the sharing of risk assessments, updated hazard mapping, disclosure information, and updated models, then decision makers can make and facilitate better building and land-use decisions.

Examples of specific changes that insurers can influence include encouraging the establishment and wider application of more resilient building codes, discouraging development in high-risk areas (e.g., via charging higher risk-based premiums to these developers), advocating for improved water regulations and engineering standards, and advocating for greater public investment in nature-based solutions and protective infrastructure such as flood defenses.

Practically, there are several ways that insurers can use their expertise to advocate for change:

1. **Expand one-on-one relationships with communities where insurers are already providing coverage.**

An example of this type of partnership exists in South Africa between Santam, South Africa's largest insurer, and a municipality along the Vaal river. After dealing with repeated flooding and increasing losses, Santam began sharing data and risk assessments with the municipality to support flood-related disaster planning and increase resilience in the area. In return, the municipality provides information around the location of specific assets such as boats to improve Santam's ability to underwrite the risks and develop relevant products. This relationship benefits the insurer in that it can improve its ability to price risk as well as reduce future disaster-related losses, thus reducing risk and keeping insurance coverage available.<sup>108</sup>

2. **Collaborate to improve data sharing and risk communication in communities.**

This type of advocacy is in effect across Austria, Germany, Switzerland, the UK, and Norway, where insurance companies and associations collaborate to create national risk maps and share data to support land-use planning within communities.<sup>109</sup>

3. **Form associations to collectively advocate for improved standards.**





Insurers exerting influence via research institutes is not a new concept and has historically been successful across many different lines of coverage.

Relevant to property insurance and addressing disaster risk, the Institute of Business and Home Safety (IBHS) in the United States uses scientific research to advocate for improved public standards and more widespread adoption of building codes and resiliency measures.<sup>110</sup> This results in a prevention of future losses and a reduction in risk, enabling insurance to remain affordable and keeping insurers active in markets.

### **Removing regulations that restrict insurance capabilities and products**

The insurance industry has a wide range of capabilities and products available in its existing toolkit to support risk transfer and reduce the existing protection gap. However, the appropriate regulatory environment must exist to enable insurers to have a more widespread impact on resilience. Many countries have restrictions that prevent insurers from participating in certain markets to the full extent. Restrictions differ depending on the region, country, and community, but include regulations around market access, actuarial-based pricing, and acceptable products and distribution channels. While not exhaustive, Exhibit 11 provides examples of regulations that hinder the insurance industry's effectiveness.

## Exhibit 11: Examples of current restrictions that hinder insurance effectiveness

REGULATION	DESCRIPTION
 <p><b>Restricted access to cross-border reinsurance</b></p>	<p>Reinsurance is beneficial in that it can transfer risk outside of a country and diversify large risks across regions, insuring what would otherwise be uninsurable. Reinsurance enables countries to recover more quickly after disaster and is particularly beneficial in areas that are more susceptible to the effects of climate change. However, many countries restrict cross-border reinsurance and prevent domestic insurers from purchasing reinsurance from a reinsurer that does not operate within the country.<sup>111</sup></p>
 <p><b>Insurance-linked securities restrictions</b></p>	<p>Insurance-linked securities (ILS), such as catastrophe bonds, provide a way to transfer additional risk directly into capital markets to supplement, or even substitute for, traditional insurance. As this product is often issued by reinsurers, it is subject to similar cross-border restrictions. More broadly, ILS are subject to stringent securities regulations.<sup>112</sup></p>
 <p><b>Risk-based pricing restrictions</b></p>	<p>Several regulations can exist that restrict the insurance industry's ability to maintain actuarial, risk-based premium pricing. These can be direct restrictions, such as capping insurance prices, or imposing community-based pricing, which leads to a distorted perception of actual risk exposure.<sup>113</sup> Regulations can also indirectly prevent risk-based pricing by impacting the insurer's ability to accurately assess and therefore price risk, such as in California with restrictions on using certain catastrophe models to price wildfire coverage (although new legislation may change this).<sup>114</sup></p>
 <p><b>Product restrictions</b></p>	<p>Parametric insurance pays out a pre-established amount based on magnitude of event (e.g., an earthquake with a magnitude of 5.0), instead of reimbursing after a claim is submitted and assessed. This reduces operational time and effort that is associated with the claims loss-adjustment process, and enables funding to reach policyholders more quickly. Microinsurance, which offers smaller payouts in exchange for lower premiums and is a growing product in developing markets, is often a parametric product.<sup>115</sup> However, this product is restricted in certain regions for example due to the inability to demonstrate an insurable interest or prove indemnification against an incurred loss.</p>

Source: Oliver Wyman analysis

Regulators need to protect and act on behalf of policyholder interests. However, there are certain cases, as exemplified in the above exhibit, where regulations do not fulfill this intended aim. According to a report published by the Insurance Development Forum, the regulatory environment must be responsive “to consumer and industry needs, including effective, efficient, timely and transparent licensing and product approval decisions; reasonable accommodation of innovative distribution models; acceptance of new risk capital structures, such as insurance linked securities; and the use of parametric products where appropriate.”<sup>116</sup> In the absence of this type of regulatory environment, insurers cannot fully meet the needs of different markets and groups to provide more comprehensive coverage whilst maintaining commercially-attractive pricing.

Both Morocco and India are examples of countries with supportive, rather than restrictive, regulatory environments. In Morocco, the regulatory authority does not require pre-approval for new insurance products and supports price liberalization. In India, the regulatory authority considers insurance a core component of its mandate and takes a proactive approach to facilitating market growth, raising awareness of insurance, and collaborating with other government agencies

There is not a perfect, one-size-fits-all solution for influencing regulations. However, insurers can start by:

- Educating government stakeholders and regulators on existing risks, how insurance can play a more significant role across different markets, and where the current regulatory barriers are to insurance making a more widespread impact
- Advocating for increased regulatory and government focus and resources on insurance, similar to the example in India. Insurance is not always explicitly called out as part of regulatory and public finance frameworks
- Sharing quantitative data and risk expertise to support the understanding of risk profiles and exposures, and encourage removal of overly restrictive regulations

## 5. Roadmap for success

The recommendations detailed in this report outline opportunities for insurers to contribute to reducing the financial and physical impact of increasing weather-related disasters, expand global insurance coverage, and ultimately improve economic outcomes. This is a commercial imperative for the industry as climate-related risks continue to grow and threaten global businesses and communities. Insurers should determine how these recommendations can be leveraged to best suit their priorities and goals, taking into consideration their key geographies, risk exposure, size, and capabilities. While the implementation of the recommendations and definition of success may vary across firms, insurers must all take steps to align their business with adaptation and resilience and address growing climate risks.

While individual insurers should establish targets for their organizations, it will be critical for global leaders to provide guidance on metrics that can track the

insurance industry's progress and measure success. Defining and sharing metrics will further encourage the insurance industry to focus their efforts on resilience opportunities. Through their expertise, resources, and influence, supranational organizations, such as the Insurance Development Forum (IDF), the International Cooperative and Mutual Insurance Federation (ICMIF), and the International Association of Insurance Supervisors (IAIS), can and are playing a vital role in providing direction on metrics, socializing ongoing progress, and highlighting potential challenges. Ultimately, though, enabling widespread impact on resilience will require a greater effort than that of a single firm or organization. It is essential for the insurance industry and its stakeholders to engage in widespread collaboration and take collective action to increase global climate resilience and adaptation.

## Supplement

# Ongoing adaptation and resilience insurance initiatives

Support for climate adaptation and resilience in the insurance industry is already well underway. The UN High-Level Champions-Adrienne Arsht Rockefeller-Marsh McLennan joint-report published last year at COP27, “Fulfilling a Legacy of Societal Risk Management,” highlighted 17 innovative insurance initiatives that were advancing climate adaptation and/or risk reduction. Over the last year, many of those initiatives have made successful progress, and many more initiatives have begun. The following case studies showcase ongoing initiatives that are working to tackle the existing resilience gap, serving as valuable examples for other stakeholders to learn from and expand upon. These initiatives encompass key themes from the recommendations such as strategic partnerships, collaboration and knowledge sharing, data and analytics, policy advocacy, product innovation, and financing and investments. These themes reflect the diverse strategies and approaches being employed to comprehensively address climate adaptation and resilience.

They also illustrate progress being made on the Sharm el-Sheikh Adaptation Agenda call to action for the insurance sector, which had three primary deliverables:

1. To spur more industry involvement in community-level projects: Strong progress in insurer engagement is reflected in the nearly 100% increase in the number of projects in this year’s report.
2. To advance the development of a common framework to measure the industry’s impact on climate adaptation: ICMIF’s joint benchmarking program with UNDRR is the most advanced, but other organizations are evolving new concepts and approaches.
3. To institutionalize an industry focus on accelerating and scaling climate resilience impact: In a highly promising development, this objective may have gained the most traction over the past year, as regulators, policy regimes and industry organizations dramatically raised the profile of and urgency around climate adaptation topics.

We thank all the institutions that provided summaries of their efforts for this report.



## **Anticipatory action and disaster risk reduction initiative**

The Insurance Development Forum, the Start Network, and MapAction have completed the first phase of their Anticipatory Action and Disaster Risk Reduction Initiative. Initially launched in 2021, the Initiative has provided detailed training to over 150 community leaders in seven countries on the use and benefits of Geographical Information Systems when developing anticipatory actions and other disaster risk reduction strategies.

The GIS training helps meet the information needs of local NGOs, supporting them to deliver effective humanitarian assistance after a disaster. For instance, this training has enabled access to insights into where frontline workers are needed most as they deliver help to communities, and where damaged roads or power failures may pose specific challenges to their work.

Participating countries include Bangladesh, the Democratic Republic of the Congo, Madagascar, Nepal, the Philippines, Senegal and Zimbabwe. Key sponsors include Aon, AXA, Axis Capital, Milliman, Swiss Re Foundation, WTW and Zurich Insurance.

Phase II will focus on scaling the training and further strengthening long-term climate resilience and anticipatory action capabilities.

### **KEY CONTACT:**

**Kipkorir Koskei**

Insurance Development Forum

## **Catalyst Climate Resilience Fund (CCRF)**

The CCRF is an impact fund and accelerator supporting pre-seed tech startups that are building a climate resilient future in Africa. The fund blends capital from concessional and commercial equity investors to invest \$200,000 in selected pre-seed portfolio companies. It combines capital and venture building support and will have significant reserves to make follow-on investments at Seed and Series A in selected portfolio companies. The Fund announced in September 2023 an initial close of \$8.6 million towards a target \$40 million fund size. The fund plans to invest in adaptation across sectors including fishery management, food systems, cold chains, and water management. To date, the fund has invested in 10 startups from six countries including Egypt, Senegal, and Morocco.

The CCRF, which was designed by the Climate Policy Initiative, is accompanied by a grant-funded facility called the Catalyst Ecosystem Hub that promotes shared learnings, builds communities, and engages ecosystem actors to create a more vibrant, informed, and effective climate resilience ecosystem in Africa.

### **KEY CONTACT:**

**Maelis Carraro**

Managing Partner, Climate Policy Initiative

## Climate resiliency challenge

US-based CSAA Insurance Group, global broker AON, and the innovation incubator IDEO launched a \$1 million Climate Resiliency Challenge to catalyze creative solutions to challenges in disaster prevention, preparedness, and recovery. In total, 418 submissions were received, but only 13 winners were recognized across three categories: Emerging, mid-stage, and advanced solutions. Examples of winning ideas include the following:

- A prescribed fire technology called BurnBot that can safely and cheaply eliminate dead vegetation, thereby significantly reducing wildfire exposures
- A flood monitoring platform called Hohonu that allows communities and their residents to track real-time flooding
- A bio-inspired manufactured oyster reef called Reef Rocket that can withstand extreme weather conditions and engage local communities in resilient design and deployment activities

Other insurance sector supporters of the challenge included Arch Re, RenRe, and Guidewire, as well as the Environmental Defense Fund, Network for Good, and InCite.

### KEY CONTACT:

**Kyra Peyton**

Senior Innovation Manager, CSAA

## Climate Insurance-Linked Resilient Infrastructure Financing (CILRIF)

Today, cities in the least developed countries (LDC's) and small island developing states (SIDS) face several critical challenges from climate change: The lack of post-disaster liquidity; the need to reallocate budgets to address disaster recovery costs instead of future development; and the inaccessibility of infrastructure finance. To address those issues, CILRIF, a voluntary working group of individuals representing multiple stakeholders, has designed an innovative facility to provide LDC and SIDS with long-term insurance coverage that is fully integrated into financing mechanisms. The effect of the blending is that the cost of financing is fully reflective of the de-risking effects of the insurance mechanism, as well as the risk reducing projects agreed to by the recipient cities.

When operative, the facility will offer the world's first decade or longer fixed price insurance policy for cities in emerging markets/SIDS, the first market-led pricing of the resilience dividend generated by system-level climate resilience projects, and the first financing facility that expressly accounts for the risk benefits generated by the projects as well as the embedded insurance.

CILRIF is aiming to serve at least 100 cities during its first five years and has set a \$1 billion equity target and a \$4 billion debt target with a TA facility to help cities adopt this "systemic approach to climate resiliency." The objective of this facility is to create a financially sustainable insurance product and make cities more resilient in the medium to long-term using reduced insurance premiums and financing risk premiums.

### KEY CONTACT:

**Abhisheik Dhawan**

UN Capital Development Fund

## **Combining Preparedness and Response Financing in one Insurance Design for Pacific Island Countries (PICs)**

Over the course of 2022 and 2023, WTW has been supporting the Pacific Catastrophe Risk Insurance Company (PCRIC) in developing a parametric drought product with a dual-trigger design, incorporating the release of pay-outs for both preparedness ahead of and response during drought.

The product design was built on insights gained from extensive consultations with key stakeholders, such as the PICs' Meteorological and Weather Service Offices, National Disaster Management Offices, Ministries of Finance, regional organizations including the Pacific Community (SPC) and the Pacific Island Forum Secretariat (PIFS), as well as humanitarian organizations such as the Red Cross (IFRC) and the Food and Agriculture Organization (FAO).

All stakeholders underscored the need for early resources to use preparedness measures such as maintaining and deploying desalination units. This was a particular priority for outer island communities which needed improvements in the facilities for harvesting and storing rainwater for households. They also needed support around changing crops and harvesting calendars and raising awareness around reducing water use through radio or newspaper announcements and community meetings.

While such measures can play a significant role in reducing the risk and cost of severe drought impacts later on, resource constraints combined with a perceived lack of urgency often leave their potential untapped.

In order to be well-aligned with national preparedness and response systems, WTW has modeled PCRIC's prospective drought index- and trigger design based on the metrics and thresholds used in PICs' national

drought monitoring and management plans. The product would also allow PICs to tailor its insurance pay-out allocations, with the initial recommendation being to earmark 10% of the selected maximum coverage for early action, and the remaining 90% for rapid response. This distribution is informed by needs assessments, interviews, and evaluating previous disaster response plans.

Over the course of 2024, the proposed product structure will be finalized on a country-by-country basis and placed with international (re)insurance markets. During this process, the project team will also collect and discuss further learnings from prior preparedness and response interventions. This will ensure the potential premium cost implications of the proposed product structure justify the additional benefits of integrating preparedness and rapid response measures more strategically. In doing so, PCRIC and WTW also hope to draw on findings from the anticipatory action community — comprised of organizations that act ahead of predicted hazards to prevent or reduce acute humanitarian impacts before they fully unfold — with focused discussions with stakeholders such as the World Food Program and FAO also in train.

### **KEY CONTACTS:**

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## Combining early warnings and anticipatory finance to protect livelihoods

Raincoat is a data, technology, and risk firm dedicated to the detection and prevention of disasters by deploying an end-to-end solution approach that encompasses a comprehensive range of operations, extending from the scientific aspects that underpin the detection and prevention of disasters to the robust technological infrastructure needed to support solutions at scale. While still early stage, they are working to apply their approach to three exciting projects that blend early warning mechanisms and anticipatory finance instruments.

The first is an early-intervention approach that would enable those affected by drought to secure water supplies, enhance irrigation systems, or implement strategies to prevent complete crop failure. This product aims to provide timely notifications and financial assistance when there is a high likelihood of a prolonged drought, thereby offering resources for effective mitigation. The second is an early warning system for volcanoes that would provide financial support to governments for relocation and prevention activities. The third is a hurricane warning mechanism that would make funds available for individuals to strengthen their homes or travel to safer locations.

KEY CONTACT:

**Jonathan Gonzalez**

Raincoat

## EC climate resilience dialogue

In late 2022, the European Commission established a special group called the Climate Resilience Dialogue to strengthen the collective understanding of insurers, reinsurers, brokers, businesses, and others about the urgency of addressing the climate protection gap. While the final report will not be published until Q2 2024, the Dialogue did issue an interim report earlier this year.

In that report, participants began by defining the protection gap as the difference between economic losses and insurance losses from the materialization of climate related risks, while taking into consideration other factors such as insurability of the risk and other forms of societal insurance coverages. In addition, they agreed to “integrate existing qualitative estimates, where possible, into a qualitative assessment of historical, current, and future protection gaps.” The interim report also identified key issues to be addressed in the final report, including the need to increase risk awareness, the importance of national risk assessments, the urgency of reducing climate risks, the factors driving the gap, the data to support all such efforts, and a roster of actionable next steps.

KEY CONTACT:

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## Extreme cold and drought cover for pastoralists in kyrgyz republic

In 2023, Blue Marble was engaged by the UN World Food Program to design and implement a meso-level weather index insurance product through pilot projects in the Naryn, Jumgal and Ak Tala of Naryn districts in the Kyrgyz Republic. The product launched on June 1, 2023 and provides pre-arranged financing to local governments acting as policyholders to support marginalized pastoralist communities in accessing fodder when availability is reduced or when pastures are inaccessible or non-productive due to climate extremes such as extreme drought and cold temperatures.

This coverage prevents households from having to sell productive assets following extreme weather events and stimulates faster recovery by allowing farmers to invest in seeds, fertilizers and innovative technologies. Overall, the financial stability of livestock farmers is increased, improving their food security and nutritional status.

Going forward, Blue Marble is working with WFP to restructure the product and develop an innovative insurance solution based on weather forecast, which will minimize the lag between the occurrence of an extreme weather event and the insurance payouts. This will further enhance the ability of local governments to support pastoralists more quickly in recovering from weather-related disasters.

### KEY CONTACT:

**Katie Merrell**

Blue Marble Microinsurance

## Flood insurance for targeted cities in Argentina

The Tripartite partnership has implemented a multi-city parametric insurance program that aims to cover as many as 1.2 million Argentinians living in the Pampa Humeda region. The program utilizes specific indexes for flooding and/or rainfall in each participating city that are linked to weather stations, radar, satellites, or other monitoring devices. Payouts will cover public infrastructure and/or emergency response services, with recipients determined by local government leaders. In addition to minimizing fiscal impacts and accelerating payouts to local responders, the program will also ensure that any public infrastructure rebuilt with program funds will meet standards for future climate exposures.

Key partners in the two-year project include Hannover Re, Scor, Guy Carpenter, Grupo Asegurador la Segunda, and Global Parametrics. UNDP, through its Insurance Risk Finance Facility, will provide long-term governance support, project management, and stakeholder convening.

### KEY CONTACTS:

**Tuga Alaskary**  
UNDP

**Kipkorir Koskei**  
IDF

## Global insurance supervisory focus on climate risk reduction

In early November, the International Association of Insurance Supervisors (IAIS) released a white paper outlining various actions the industry's regulatory bodies could take to reduce climate-related protection gaps. Titled "A Call to Action: The Role of Insurance Supervisors in Addressing Natural Catastrophe Protection Gaps," the paper sets out five areas where supervisory action can best contribute to addressing protection gaps by: (1) assessing insurance protection gaps; (2) improving consumer financial literacy and risk awareness; (3) incentivizing risk prevention and reduction of insured losses; (4) creating an enabling regulatory and supervisory environment to support availability of insurance and uptake of coverage; and (5) advising government and industry on the design and implementation of public-private partnerships or insurance schemes.

The report also highlighted the importance of multi-stakeholder engagement, and suggested quite strongly that reducing protection gaps are proper activities for insurance supervisors to pursue. The IAIS now plans to build off of the report by engaging policymakers, industry leaders and other key stakeholders such as the Organization for Economic Cooperation and Development, the Global Shield against Climate Risks and Insurance Development Forum.

### KEY CONTACT:

**Conor Donaldson**

International Association of Insurance Supervisors

## Innsure corps

The climate-focused InsurTech incubator InnSure launched a new insurance sector professional development network that aims to organize, train, and deploy a legion of risk-literate insurance activists to — among other things — support technical assistance providers in at-risk/in-need communities. The program, called InnSure Corps, was launched during Climate Week NYC, and within a month had chapters established in eight communities including New York, San Francisco, Boston, and Bermuda.

When fully implemented, the InnSure Corps will receive specialized training in the various roles the insurance sector can play in advancing climate resilience, including working directly with key partners to facilitate the delivery of members' risk expertise, insurance knowledge, and climate passion.

### KEY CONTACT:

**Charlie Sidoti**

Executive Director, InnSure

## Kenyan tea development authority pursues index priced insurance

Kenyan Tea Development Authority (KTDA) serves 600,000 smallholder farms through 54 separate factories which provide access to inputs and purchase farm outputs. It established an insurance brokerage in 1976, which procures and provides both health and livestock insurance to the farmers. Tea output is strongly affected by drought, hail, floods, heat, and cold. KTDA, through its insurance brokerage subsidiary, has identified the need for and secured agricultural area yield index pricing for its MSMEs. It has the last-mile workflows in-place, including payroll premium deductions, but needs go-to-market support to scale the new product.

### KEY CONTACT:

**Brandon Mathews**

V20 Sustainable Insurance Facility



## Milwaukee river risk and resilience initiative

The Milwaukee River Risk and Resilience Initiative (M3RI) is a public-private partnership that seeks to utilize the insurance mechanism to capture and scale the economic benefits of nature-based risk reduction projects across the Milwaukee River watershed. The Metropolitan Milwaukee Sewerage District (MMSD) is a long-time leader in deploying nature-based solutions to address water quality and flood management challenges. Recently, they entered into a larger-scale program with Ducks Unlimited (DU) to restore 4,000 acres of wetlands and plant six million trees to reforest the Milwaukee River watershed.

In an effort to document and monetize the flood reduction benefits of these projects, Guy Carpenter is working with MMSD and DU to reconcile their modeling of the hydrological impacts of the new vegetation with more traditional insurance catastrophe risk modeling by working with leading (re)insurance companies to structure a parametric-based community-level insurance program that would be re-priced each year — up or down — to reflect the new risk factors. If successful, the program should create a scalable model for capturing the positive externalities of nature-based flood mitigation projects.

The M3RI continues to seek funding partners for the effort, as well as other private sector actors — including farmers, shippers, and railroad companies — that can contribute to reducing flood risk even further throughout the watershed. The anticipated implementation in 2024.

### KEY CONTACTS:

**Kevin Shafer**  
MMSD

**Kellis Moss**  
Ducks Unlimited

**Francis Bouchard**  
Marsh McLennan

## Neighborhood heat protection concept

California's Fourth Climate Assessment identified extreme heat as one of the deadliest forms of climate related risks. In one 10-day heatwave in 2022, the state's public health agency estimated that nearly 400 people died of heat-related causes.

To address this, the California Department of Insurance is promoting a program to provide communities access to parametric insurance structures to help them address extreme heat exposures. The program would utilize a two-tiered trigger mechanism — meaning both an agreed upon temperature or humidity level as well as a set duration of days, nights, or hours — that would then fund a pre-determined extreme heat action plan or agreed upon set of activities ranging from the funding of cooling centers and the transport of affected citizens to the construction of new resilience facilities or the creation of urban forests. The funds could also be used to recoup previously invested resilience investments.

### KEY CONTACT:

**Deborah Halberstadt**  
California Department of Insurance

## New Zealand natural hazards portal

Due to its exposed location in the Pacific Ocean, New Zealand is subject to a range of natural hazards, including earthquakes, landslides, volcanic activity, tsunamis and flooding. To address these growing exposures, Toka Tu Ake EQC, a New Zealand Crown entity that provides natural hazard research, education and insurance, has established a Natural Hazards Portal to help communities and people understand their exposures and their choices. Capabilities on the portal include granular details on hazard exposures, tools for conducting personalized risk assessments, and proposed steps to reduce and manage natural hazard risks. Much of the information is publicly available, but the consolidation of the information on one easy-to-use portal significantly improves the customer experience.

Toka Tu Ake EQC aims to use the portal to help clients reduce the exposures to their homes, which in turn will generate savings through lower premiums and lower losses following disasters.

### KEY CONTACT:

Sid Miller

V20 Sustainable Insurance Facility

## Parametric insurance helps reef guardians deliver hurricane response for the Meso-American Reef (MAR)

To support teams of 'reef guardians' who implement emergency reef response activities in the aftermath of a hurricane, the MAR Fund and WTW created the MAR Insurance Programme which uses parametric insurance to deliver rapid payouts.

The MAR Insurance Programme (which was created with financial support from the InsuResilience Solution Fund and others) is a central pillar of MAR Fund's Reef Rescue Initiative. The programme supports the 1,000km Mesoamerican reef spanning Mexico, Belize, Guatemala and Honduras. Home to 65 species of coral and more than 500 species of fish,

over two million people depend on the reef ecosystem for their livelihoods, nutrition, and coastal protection.

The value of the MAR Insurance Programme was demonstrated in November 2022 when Category 1 Hurricane Lisa passed directly over Belize's Turneffe Atoll. This triggered a \$175,000 payout from the insurance programme, with the MAR Fund receiving the funds from insurance capacity providers, AXA Climate and Munich Re, within two weeks of the event. Within 48 hours of receiving the payout, MAR Fund transferred the funds out to the reef guardian teams, coordinated by Turneffe Atoll Sustainability Association (TASA). Within 15 days of the event, the first reef guardians were in the water beginning to implement the Reef Response Protocol.

Now in its third year, the MAR Insurance Programme covers 11 reef sites across the region. This award-winning programme proves the reliability, timeliness and effectiveness of parametric insurance to support ecosystem resilience. Plans are well underway to build a sustainable source of premium financing and an expanded response capacity in the coming years.

Building on lessons learned from the MAR Insurance Programme, and with support through the Ocean Risk and Resilience Action Alliance (ORRAA) from the Government of Canada (announced at COP27), the MAR Fund, WTW and partners are now designing a similar programme for San Andrés and Providencia, Colombia. The same project is also exploring the feasibility of insurance to cover additional coral reef risks, such as bleaching and rainfall-driven runoff.

At the same time, the Asian Development Bank (ADB) and other actors in the Pacific are pursuing coral reef insurance programs.

### KEY CONTACTS:

**Karina Whalley**

Head of Public Sector, AXA Climate

**Sarah Conway**

Director, Disaster Risk Finance & Parametrics, WTW

## Research and development targets future-state farming and protection gaps

AXA Climate is engaging in a range of future-proofing R&D efforts. For example, the firm is part of an EU Horizon funded project call the Piloting Innovative Insurance Solutions for Adaptation (PIISA) research program. The overall vision of PIISA is that by 2030, at least 50% of losses attributable to climate change effects in Europe will be covered by insurance, the adaptation gap will be demonstrably shrinking, and new insurance solutions will contribute to the reduction of the adaptation gap. Examples of those new products will range from forest insurance for certain biotic and abiotic risks, wildfire insurance and adaptive actions, green roof insurance, and new insurance services for agriculture. More information can be found [here](#).

Another example is AXA Climate's support for a major agricultural actor to build a "farm of the future" with optimal and competitive crop rotations adapted to the future climate, while promoting sustainable management of water resources, soil health, and biodiversity. AXA Climate is leveraging its in-house agricultural advisory tool *Cérès* to provide this advice.

### KEY CONTACT:

**Karina Whalley**

Head of Public Sector, AXA Climate

## Risk analytics as the underpinning of infrastructure investment

AXA Climate has engaged in dozens of climate risk screenings and adaptation advisories in 2023 with clients ranging from multilateral development banks to other financial institutions, to private industry actors. In a 2023 flagship project financed by the World Bank, AXA Climate carried out a future-state climate screening of more than 65,000 telecom assets and 95,000 km of cables in West Africa under different time horizons and IPCC climate scenarios. This study revealed the increasing threat of heatwaves, wildfires, landslides, and floods by 2050, which can disrupt, damage, or destroy digital infrastructure, which is pivotal for the economic development of the ECOWAS region. Specific adaptation measures per asset type and peril were proposed for sites identified as being most at risk according to the analysis.

AXA Climate also provided national and regional policy recommendations on the integration of climate resilience in public-private infrastructure projects, by fostering resilience for foreign investors. This included incentivizing private sector investors in partnerships to adopt adaptation measures. This can be done through a clear allocation of responsibilities between the public and private parties: the private party should bear all the risks that could have been avoided by complying with the adaptation measures set out in the contract.

### KEY CONTACT:

**Karina Whalley**

Head of Public Sector, AXA Climate

## **Risk assessment for my home**

Allianz Versicherungs AG, Allianz P&C insurer in the German market, is offering a new risk assessment tool that provides an individually tailored view on natural hazard risk to homeowners and supports them in preventing some of the damage that floods, storms, wildfires, and earthquakes can bring. By simply entering their address on a web page, any user can receive an immediate view of the risk for the four common natural hazards at their home's location. This individual assessment is based on the tools Allianz uses to evaluate and calculate natural hazard risk around the world. The assessment is displayed in a way that is easy to understand and act upon. As a very first step, the tool is designed to create awareness for potential risks homeowners face. Users can then decide for themselves what the right choice is for them: accept the risk and at best set aside money for the event of a disaster, take out insurance cover, and/or protect themselves better with the resilience measures suggested in the tool, e.g., by implementing structural measures such as flood windows or adjusting their behavior in an event of a disaster.

Allianz Group is currently working on scaling the solution globally and making this service available for users in other countries as well.

### **KEY CONTACT:**

**Dr. Kerstin Reinisch**

## **Risk sharing for loss and damage: Scaling up protection for the global south**

New research from the University of Cambridge Institute for Sustainability Leadership (CISL), with risk analysis from Howden, demonstrates the transformative economic efficiency of risk-sharing systems to provide vulnerable countries with financial security from climate related disasters.

The smallest and most vulnerable countries risk losing over 100% of their GDP from extreme climate shocks next year, according to the findings, which underlines the scale and severity of the risks faced by the Global South. Small Island Developing States (SIDS) and other vulnerable countries bear these overwhelming threats almost alone.

The report, which models Loss and Damage (L&D) implementation, reveals these risks are insurable and proposes a solution using the power of insurance and capital markets to dramatically scale up the impact of L&D funding. The modeling shows that the intolerable financial risks faced by this group of countries could be reduced to just 10% of GDP.

[Read the full report here.](#)

### **KEY CONTACT:**

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Howden Group

## Senegal Public Solidarity Fund (FSN)

Senegal's Fonds de Solidarite Nationale (FSN) aims to provide timely emergency relief response to populations affected by climate and disaster shocks in Senegal. Their public-private partnership with Gallagher Re's Public Sector & Climate Resilience Solutions practice focuses on leveraging the role of the private sector in their financial preparedness and resilience strategy.

The work — which started in 2022 — adopts a holistic approach to climate adaptation and resilience. By anticipating future, highly disruptive climate events (e.g., drought, flood, and wildfire) and mobilizing ex-ante financing where most cost-efficient, it combines the use of various risk financing instruments in a highly complementary and mutually enhancing manner. It factors in ongoing and future risk reduction activities and adaptation investments, while designing insurance products where most cost-efficient. This ensures the most impactful use of climate finance in general and higher value-for-money for risk transfer in particular.

The living risk financing strategy is expected to maximize the use of public funds for the benefit of distressed and vulnerable populations affected by complex social, economic, and disaster shocks in Senegal. This could pave the way to more systematic use of integrated approaches across climate adaptation and resilience in the region.

### KEY CONTACT:

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Global Head of Public Sector & Climate Resilience Solution, Gallagher Re

## Sri lankan red cross establishes its own insurance brokerage

Mitigating loss is core to the Red Cross mission. For its own risks, the Sri Lanka Red Cross Society possesses an insurance brokerage which it now seeks to develop, together with Stonestep, an impact insurance specialist and technology provider. The project forms a new legal entity with the parties' assets to support demand aggregators at low cost and risk. The project is part of Sri Lanka's Climate Prosperity Plan and has broad support from both government and large demand aggregators. It starts by replicating Stonestep's successful work with community-based cooperatives in Nepal, combining this with Red Cross in-country assets. The project requires support to finalize workflows, secure parametric underwriting, and then to deliver go-to-market. The project is estimated to reach ~6M households / MSMEs.

### KEY CONTACT:

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V20 Sustainable Insurance Facility

## Talent secondment program supports cities' adaptation efforts

The Sustainable Markets Initiative (SMI), Howden, and the Resilient Cities Network have established the Global Risk and Resilience Fellowship, a first of its kind top talent secondment program, to support city leaders harness the power of insurance and de-risk and accelerate resilience-building activities.

The program seeks to match the specific needs of the cities with the relevant insurance expertise of the Fellows. From the applicants, five cities across three continents were selected: Glasgow, UK; Greater Miami & the Beaches, USA; Melaka, Malaysia; The Hague, Netherlands; and Surat, India.

The fellowship has already contributed to building city resilience by addressing the shocks and stresses identified by each city. By selecting fellows with expertise to meet the specific needs of a city, and then placing the fellows within a city's leadership team for a prolonged period, the Fellowship cultivated effective partnerships and productive working relationships.

City leaders have accessed expertise which catalyzes their ability to deliver a secure, equitable, and sustainable future for their city. Through Resilient Cities Network these learnings can be shared across the remaining 100 cities, resulting in cascading benefits and the opportunity to increase urban resilience globally. Equally, the fellows have had an invaluable learning experience, collaborating with others in their industry to drive innovation and explore the role that insurance can play in building the resilience of communities across the globe.

### KEY CONTACT:

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Howden Group

## Tripartite agreement

The Tripartite Agreement is the largest public-private-partnership in insurance for development. It was established by the United Nations Development Programme (UNDP), the German Federal Ministry of Economic Cooperation and Development (BMZ) and the Insurance Development Forum (IDF) in 2019 at the UN Secretary General's Climate Action Summit. In the last year, the Partnership has emerged as a fully-fledged portfolio of more than 20 impact-focused projects across the most vulnerable countries. In fact, the 10 most advanced projects are expected to benefit 37.5 million people by 2025, leveraging the \$5 billion of risk capacity committed by IDF members. Examples include a \$50 million flood parametric program in Ghana, a \$100 million drought parametric program in Mexico and a \$50 million urban flooding program in Lagos, Nigeria.

The operational responsibilities are also well defined. The IDF's 20 (re)insurance and broker members provide technical assistance in developing risk financing solutions, the UNDP provides coordination, in-country project management and stakeholder convening, as well as delivery of comprehensive technical assistance to embed insurance into governance and long-term development, and the German government provides funding.

### KEY CONTACT:

**Kipkorir Koskei**  
Insurance Development Forum



## **UNCDF partners with Howden to build climate resilience for vulnerable communities in Fiji**

Insurance broker Howden partnered with UNCDF's Pacific Insurance and Climate Adaptation Program (PICAP) to support Fiji's vulnerable communities to build resilience and financial preparedness against climate shocks. The flagship program has developed and deployed the Pacific region's first parametric microinsurance products in Fiji, Tonga, and Vanuatu.

Parametric insurance is a pre-arranged financing instrument that can provide rapid access to funds following a specified natural disaster — known as a “trigger” event. It can simultaneously help narrow the protection gap in the Pacific and harness private sector acumen and resources to bolster disaster relief activities.

In the first two weeks of January 2023, Fiji experienced heavy rainfall resulting in a trigger payment of the parametric insurance product. Payments were transferred digitally to 536 beneficiaries, who received payouts into their mobile wallets ten days after receiving the final verified data from the Fiji Meteorological Office and the index monitor, demonstrating the value of parametric risk transfer.

Howden provided subsidy support for the premiums of beneficiaries most vulnerable to damage from tropical cyclones and floods, including smallholder farmers, fishermen, market vendors, female-headed households, and people with disabilities.

### **KEY CONTACT:**

**Sophie Sacarello**  
Howden Group

## **UNDP insurance innovation challenge funds**

In 2023, UNDP's Insurance & Risk Finance Facility (IRFF) launched a series of Insurance Innovation Challenge Funds (IICF) with industry partners to tackle growing risks by incentivizing the development of transformative and innovative insurance products and services.

Together with The International Cooperative and Mutual Insurance Federation (ICMIF), the IRFF co-financed a global Insurance Innovation Challenge Fund to incentivize mutual and cooperative insurers to develop insurance products for vulnerable and low-income populations. The UNDP-ICMIF IICF was initially capitalized with \$600,000 and selected four projects in India, Kenya, Sri Lanka, and Malawi to scale existing microinsurance programs to reach new customers and market segments.

As part of their broader partnership to support SMEs' resilience to climate and other risks, UNDP and Generali launched an IICF focused on catalyzing the development of innovative insurance products that enhance the resilience of SMEs in Malaysia. The Challenge Fund facilitates and incentivizes the development of two solutions through a \$40,000 award for each winner along with technical assistance. The winners will be announced at a joint event in Kuala Lumpur in early 2024, along with the launch of a joint report on how insurance can build SMEs' climate resilience in ASEAN, with a focus on Malaysia and Thailand, and a framework for SME Loss Prevention. In 2024, the IRFF will launch its major challenge fund in over 20 countries, facilitating the development of over 40 innovative insurance solutions.

### **KEY CONTACT:**

**Lauren Carter**  
United Nations Development Programme

## Urban flood cover for Lagos, Nigeria

The UNDP-BIZ-IDF Tripartite partnership is pursuing an innovative parametric program to protect 8.5 million residents of Lagos from regular widespread flooding. The program will cover both public infrastructure and impacted populations and will be integrated into the state's existing flood risk management framework. Any required rebuilding of public infrastructure will be done to standards that reflect future climate exposures, thereby enhancing community resilience.

The program is currently slated to last from January 2023 to June 2024, but expectations are that it will be embraced and extended by the state or national governments. Key partners in the project include AXA Climate, Swiss Re, the African Risk Capacity, ICEYE, and JBA Risk Management.

### KEY CONTACTS:

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United Nations Development Programme

**Kipkorir Koskei**

IDF

## Vessel viewer: Technology, partnerships, oceans

The Ocean Risk and Resilience Action Alliance (ORRAA), along with partners Global Fishing Watch and TMT, have developed an innovative new technology tool called Vessel Viewer that offers critical information on vessel identity, activities, and authorizations, so that insurers can assess whether a vessel may be engaging in or supporting illegal, unreported, or unregulated fishing. By arming underwriters with this important information, insurers can more effectively evaluate their potential risk exposure, and enable them to flag any concerns or gaps to investigate further before proceeding with insurance coverage. The initiative has also worked with the environmental non-profit Oceana to develop new insurance policy wording with the Lloyd's Market Association (LMA) that enables insurers to cut off policy coverage to a vessel, its owners, or its managers, if they are added to an official government IUU fishing blacklist.

A beta-version of Vessel Viewer was pilot tested with 16 insurance and reinsurance companies helping to co-develop the tool with industry insight. Feedback has resulted in an updated Vessel Viewer 2.0, launched in October 2023.

Further improvements and additional features will be released in early-to-mid 2024. The development of these features is also being informed by feedback received during the pilots with insurers. Vessel Viewer is now available for commercial use by insurers. Vessel Viewer's Application Programming Interfaces (APIs) are also now available for integration directly into insurers' internal data tools.

### KEY CONTACT:

**lindsay getschel**

ocean risk & resilience action alliance

## **ZestyAI-SBP CDRZ pilot**

In an exercise intended to illustrate the power of the recently enacted Community Disaster Resilience Zone (CDRZ) legislation in the United States, ZestyAI — a leading provider of climate and property risk analytic solutions — teamed up with the national disaster resilience non-profit SBP to create a pilot replicating CDRZ's big data, risk reduction analysis, and community level funding focus. It started with a three-day hackathon where ZestyAI employees integrated the government's risk and social equity datasets to identify the three US communities most vulnerable to wildfire exposures. ZestyAI then applied its machine learning capabilities to identify and price the specific risk reduction approaches required to reduce the wildfire exposure in all three communities. SBP then successfully pursued a \$100,000 grant award from the Climate Resilience Challenge that will now be used to implement ZestyAI's risk reduction recommendations.

### **KEY CONTACTS:**

#### **Nick Allain**

Head of Marketing, ZestyAI

#### **Liz McCartney**

Chief Operating Officer, SBP

## UPDATES TO LAST YEAR'S REPORT

### Coastal Risk Index (CRI)

In the year since the last Race to Resilience report, the Ocean Risk & Resilience Action Alliance's Coastal Risk Index (CRI) has evolved from the "pre-implementation" to "implementation" phase with the September 2023 launch of the CRI's initial risk analysis website and maps. The open-source platform provides detailed coastal risk mapping (down to the 90-meter resolution levels) that should equip financial institutions, investors, insurers, infrastructure project managers, and policymakers with the detailed risk analytics necessary to improve decision making and incentivize investment in nature-based solutions.

The CRI tool has already revealed that natural risk barriers such as coral reefs and mangroves prevent annual flooding for 14.2 million people and protect over \$360 billion in physical assets. The initiative is supported by US, Canadian, and UK governments, as well as the global insurer AXA.

#### KEY CONTACT:

**Chip Cunliffe**

Ocean Risk and Resilience Action Alliance

### Community-Based Catastrophe Insurance (CBCI)

Last year's report included a reference to a CBCI pilot that was still in development. Since then, the transaction has been fully implemented whereby a local non-profit home ownership organization, The Center for NYC Neighborhoods, secured a parametric risk transfer cover that — if triggered — would allow them to activate an assistance program of emergency cash grants to cover immediate post-flood needs for the most vulnerable New York City neighborhoods.

Constructing the program required a diverse set of capabilities and important local sponsorship. Partners included the Environmental Defense Fund, the Center for NYC Neighborhoods, the New York City Mayor's Office of Climate and Environmental Justice, SBP, Guy Carpenter, Swiss Re, and ICEYE.

Since the completion of this initial pilot, several communities across the country have expressed interest in utilizing a similar structure to enhance community resilience, particularly among lower income and underinsured populations.

#### KEY CONTACTS:

**Bridget Carle**

Guy Carpenter

**Joe Becker**

Guy Carpenter

## Community Disaster Resilience Zones (CDRZ)

Last year, CDRZ was included in the Race to Resilience report as an example of a public policy initiative being promoted by the reinsurance sector as a means of addressing both social equity and climate risks. Since last COP, the US Congress enacted CDRZ by overwhelmingly large majorities, and the Federal Emergency Management Agency (FEMA) designated nearly 500 US communities as CDRZ zones, thereby increasing federal funding options, providing access to technical assistance capabilities, and prioritizing CDRZ communities for various federal programs.

The insurance sector is now pursuing two primary ways of advancing the CDRZ concept. The first is to work with potential technical assistance providers to ensure that communities have access to risk analytics and professional risk management advice. The second is to promote an accompanying piece of federal legislation that would provide tax incentives for investing in CDRZ community climate adaptation or risk reduction projects. If successful, such an approach could transform climate resilience financing in America.

### KEY CONTACT:

**Francis Bouchard**  
Marsh McLennan

## Extreme heat pilot & future scale-up in India

In 2023, Blue Marble partnered with the Adrienne Arsht-Rockefeller Foundation Resilience Center (Arsht-Rock) and the Self-Employed Women's Association (SEWA) to provide cover against the impacts of extreme heat on the health and working conditions of women in India's informal sector. Blue Marble led the product design, with valuable inputs from and collaboration with Arsht-Rock's team of health and extreme heat experts, to create a truly first-of-its-kind product. This parametric insurance is activated once specific extreme heat conditions that could endanger health — such as daily maximum temperatures — are met.

Alongside this, additional funding from Arsht-Rock provides tools and resources (such as shade tents, solar lights and coolers) to help create a safer work environment. Following its launch in May 2023, over 21,000 women in the state of Gujarat participated in the program's pilot.

Going forward, Blue Marble aims to replicate the mechanism with other organizations and countries, and to include a forecast component so that payouts would be initiated following weather forecast data, rather than post-event weather data.

### KEY CONTACT:

**Katie Merrell**  
Blue Marble Microinsurance

## Global actuarial initiative expands to 10 countries

In September 2022, UNDP and Milliman created the Global Actuarial Initiative (GAIN) to help developing countries better understand and manage their climate risks by building actuarial capacity and deepening insurance markets. One year later, this bold and unique initiative is thriving; more than 50 Milliman “ambassadors” have delivered workshops in 10 IRFF program countries and the remaining countries will participate in the GAIN in 2024.

### KEY CONTACT:

**Lauren Carter**  
UN Development Program

## ICMIF/UNDRR insurer benchmarking on climate resilience mechanisms

Last year’s report highlighted a set of “seven mechanisms” that the International Cooperative and Mutual Insurer Federation (ICMIF) and the United Nations Office for Disaster Risk Reduction (UNDRR) identified as steps insurers could take to support climate resilience: Pricing, conditions precedent, investments, awareness, analytics, modeling, and collaboration.

Since then, ICMIF and UNDRR have been soliciting ICMIF membership to apply the seven mechanisms to their own operations, and then to voluntarily agree to benchmark those efforts against other ICMIF members (Zurich Insurance Group has also agreed to participate in the benchmark). The aim is for participating insurers to learn from one another and to encourage bolder and bolder steps.

### KEY CONTACT:

**Liam Carter**  
International Cooperatives and Mutual Insurers Federation

## Index-based flood coverage for Nepali communities

Nepal is highly prone to natural hazards, primarily because of its diverse topography and climatic conditions, geological position, rugged mountains, and steep landscape. In particular, communities downstream of the Karnali River face massive flood risks. To address these exposures, the global NGO Practical Action and the InsuResilience Solutions Fund co-funded an innovative approach to providing both risk transfer benefits and flood mitigation services to some of the most vulnerable communities.

The program, developed by Global Parametrics, Stonestep, and Shikhar Insurance, provides an index-based parametric cover for leading microfinance institutions in the region, who in turn distribute post-disaster funds to those borrowers worst affected by the disaster. In addition to the risk transfer elements, the program also deploys Practical Action’s Flood Resilience Program (which itself is part of the Zurich Flood Resilience Alliance), which engages participating communities in creating meaningful risk reduction and emergency response plans.

The plan is to roll the program out to 267,000 inhabitants of 11 Nepali communities by 2025.

### KEY CONTACT:

**Daniel Stadtmueller**  
Team Lead, InsuResilience Global Partnership



## Meso-level approaches to climate risks in Ghana

Under the umbrella of the InsuResilience Global Partnership, the German development agency GIZ has partnered with Allianz Re to help three flood-prone communities in Ghana develop and implement Integrated Disaster Risk Management Plans. The effort began with the collection of relevant and/or missing data, the modeling of flood hazards, and extensive risk assessments based on the Economics of Climate Adaptation methodology.

Based on these findings, the municipalities conducted cost-benefit analyses of protecting high-value public assets, while also pursuing risk literacy, waste management, contingency planning, and early warning activities. In addition, they leveraged earlier efforts by the World Bank to develop an app that enabled risk-informed decision-making and early warning signaling.

Allianz Re utilized much of the same data and analytics to develop a bespoke insurance program for publicly held assets that included a 20% rapid payment component that would cover response actions for those households most affected by the events.

### KEY CONTACT:

**Daniel Stadtmueller**

Team Lead, InsuResilience Global Partnership

## Smallholder farmers in Mexico

Last year's report featured a Tripartite partnership program focused on smallholder farmers in Mexico. The program covers over 10,000 farmers against flood and drought through a sovereign parametric solution. The parametric cover was triggered twice during the pilot phase, providing over 1,400 farmers with payments to compensate for lost income and enhance community resilience. The program was considered so successful that the Mexican government is seeking additional budget authority to continue paying premiums beyond 2024. The aim is to benefit over 3.5 million vulnerable people by 2025.

Leading partners in the program include Axa Climate, Munich Re, Guy Carpenter, Swiss Re, Raincoat, and Agro Asemex. In addition, UNDP, through its Insurance and Risk Finance Facility, works closely with the Mexican government to help incorporate risk management tools into their development and climate change initiatives.

### KEY CONTACTS:

**Tuga Alaskary**  
UNDP

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IDF

## **Urban Infrastructure Insurance Facility (UIIF)**

Last year's report featured the launch of Urban Infrastructure Insurance Facility (UIIF), a multi-city pooling concept that aims to facilitate access to climate finance, transfer catastrophe-level exposures, and identify pre-event risk reduction initiatives. Sponsored by Local Governments for Sustainability (ICLEI), the program has now selected and on-boarded its 10th participating city, each of which will undergo a thorough seven-step process of identifying, managing and financing climate risks.

The program's goals are to form a diverse risk pool across the 10 cities, cover at least 7.5 million poor and vulnerable people and deploy at least 100M Euro of insurance limits across the insured cities. UIIF is financed by KfW Development Bank on behalf of the German Federal Ministry for Economic Cooperation and Development.

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We would also like to thank the experts across the insurance industry who spoke with us and provided valuable insights for this report.

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