



# Fulfilling a Legacy of Societal Risk Management

Mobilizing Insurance Sector Capabilities to Advance  
Community-Level Climate Risk Reduction and Adaptation

UN Climate Change High-Level Champions 2030 Adaptation Outcomes for Finance

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.

# STATEMENT OF PURPOSE

From UN Climate Change High-Level Champions

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## The Sharm el-Sheikh Resolution

on Insurance Sector Leadership on Climate Risk Reduction and Adaptation  
Presented at COP27. Sharm el-Sheikh, Egypt



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UN Climate Change High-Level Champion  
for Egypt, COP 27



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COP27 will be remembered as the year the world moved from ambition to action. The year loss and damage evolved from a political question between polluter and aggrieved states into a social movement to accelerate climate risk reduction and scale adaptation. And the year private enterprise accepted the mantle of leadership to deploy its unique capabilities and influence to protect billions of vulnerable bystanders from the physical ravages of climate change.

That is why it is so fitting that it is here in Egypt — the birthplace of modern mathematics — that the UN Climate Change High-Level Champions call on the insurance sector to expand its role in advancing climate adaptation, here in Egypt, across Africa and with vulnerable communities globally. As an industry built on the mathematics of risk, it is uniquely positioned to assemble the tools, networks and capabilities to de-risk, finance and accelerate community-level climate risk reduction. It boasts a proud legacy of enhancing societal resilience against a litany of new and complex risks and must play that role again by helping communities cope with climate change, not just through innovative risk transfer mechanisms but by actively deploying their capabilities to “flatten the climate risk curve.”

In these pages you will find examples of radical collaboration with industry leaders joining NGOs, governments and development agencies to redefine the role of insurance in promoting climate risk reduction and adaptation. Our aim is to build on these pioneer projects and engage the sector in a broader dialogue on how to scale its impact at a community level before it is too late. Together we can make a difference. And together we can meld ambition with action to match the opportunity at this moment in history.



## Introduction

Recent headlines attest to the IPCC's repeated warnings<sup>1</sup> about the urgent need for climate risk reduction and adaptation. "Climate Catastrophe in Pakistan as Flooding Deaths Pass 1,000"<sup>2</sup>; "England's Scorching Summer Heat Wave Kills Record Number of Elderly"<sup>3</sup>; "Hurricane Ian's Financial Toll Threatens Florida Real Estate Market"<sup>4</sup>. The question is no longer whether climate change will threaten vulnerable populations with sea level rise and extreme weather, it's a question of when and how.

The Race to Resilience, a global campaign by the UN Climate Change High-Level Champions, was established to catalyze public and private sector commitments and action to advance climate risk reduction and adaptation. And as part of the Sharm EL Sheikh Adaptation Agenda that defines the 2030 Adaptation Outcomes for Finance (see box), the UN Climate Change High-Level Champions are calling on the global insurance sector to expand direct support for climate risk reduction projects, develop a common capabilities framework and assess options for a longer-term scaled approach to de-risking, financing and accelerating climate adaptation.

This report aims to support those efforts by

1 IPCC, 2022: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844

2 The Scanner, August 28, 2022

3 Gizmodo, October 12, 2022

4 New York Times, October 13, 2022

show-casing the many approaches already being pursued by insurance sector pioneers to deploy core capabilities in ways that advance pre-event climate risk reduction. It also introduces an early-stage capabilities framework by applying five discreet capabilities to each of the 17 demonstration projects and enablers. The hope is that by celebrating early movers, expanding insurer support for demonstration projects and providing a common vernacular of capabilities, this campaign will prompt and facilitate a deeper assessment among industry leaders on how to institutionalize scaled impact on climate adaptation.

### The UN Climate Change High-Level Champions are calling for action around **three 2030 Adaptation Outcomes for Finance:**

1. Public finance actors increase provision of climate finance and allocate 50% of climate funds to A&R
2. Private sector integrates physical climate risks into investment decisions and continues to innovate mechanisms for financing A&R so as to enable the mobilization of the \$140 to \$300B by 2030 that will be needed across both public and private sources
3. Global property and casualty insurance sector has an industry capabilities framework, actively supports project implementation, and institutionalizes a longer-term industry approach to climate adaptation

# An Industry Rooted in Risk Reduction

The insurance sector boasts a proud legacy of risk reduction impact. By putting a price on risk, insurers send the ultimate economic signal about the anticipated frequency and severity of particular risks, and by adjusting those signals can incentivize risk-reducing behaviors. Furthermore, the trillions of dollars paid in claims each year represent the largest financial contribution to individual, business and community resilience than any other source besides government. Behind both functions — risk signaling and financial resilience — stand complex systems of risk analytics, portfolio diversification, asset-to-liability matching, reinsurance optimization and tech-enabled operational and administrative platforms that make a simple quote or claims check possible.

To illustrate just how extensive that core role in societal risk reduction can be for insurers, the **International Cooperative and Mutual Insurer Federation (ICMIF)** and the **United Nations Office of Disaster Risk Reduction (UNDRR)** recently launched a website [[ICMIF Prevention Hub — International Cooperative and Mutual Insurance Federation](#)] detailing seven direct and indirect mechanisms insurers can utilize to send and reinforce risk reduction signals. From awareness and analytics to pricing and prerequisites, the ICMIF Prevention Hub features tangible examples of insurers advancing both practical and societal risk reduction through an assortment of over 60 case studies, initiatives and efforts — some beyond the ordinary, but most very much the ordinary for an industry rooted in helping its customers manage the risks of modern life.

Building on these seven mechanisms the UNDRR and ICMIF members developed a benchmark for measuring resilience against the mechanisms which was launched at the ICMIF Conference on 26 October by the Head of UNDRR, Mami Mizutori. The

benchmark will be used by members over the next 12 months to measure where each insurer is on their resilience journey and to share best practices among other insurers.

While profound in their ability to incentivize individual policyholders to adopt risk sensitive behaviors, insurers still face challenges applying their collective capabilities to certain classes of risks. In some cases, it is because the risk is so new that actuarial science is stymied by the lack of reference points. In other cases it is because the nature of the risk isn't fortuitous. Or in others it may be that the relatively short-term nature of most insurance policies is a mismatch for the longer-term manifestation of the risk.

Even in these cases, though, the industry has an impressive history of finding new risk management models that deploy the sector's core capabilities in manners other than traditional terms and conditions. When the 1892 World's Fair ushered in the age of electricity, the insurance sector established Underwriters Laboratory to test the fire safety of all electrical appliances, essentially making the world safe for electricity. Following the catastrophic fires of the early 1900's it was the insurance sector that pushed for fire hydrants, emergency escapes and local fire stations. And a few decades later when the first modern highway system promised faster travel, insurers documented the increased risk exposures and created the Insurance Institute for Highway Safety, which today sets the standard for auto safety. None of these approaches rely on pricing as the risk signaling mechanism. Instead, they focus on risk awareness and risk reduction, and, by applying system-level influence at the root cause of the risk, ensured the sustainability of fire, homeowners and auto insurance markets.

# Standing on the Shoulders of Giants

Many in the insurance sector — as well as many in the public sector — have recognized the critical role insurance can play in helping society manage climate risks and have taken concrete actions to broaden the use of insurance-based tools. Early movers include the **UN's Environment-Finance Initiative's** 2006 publication on the role of the finance sector in advancing climate adaptation, and the UK insurance sector group **ClimateWise**, which published its first report on the industry's role in climate adaptation in 2010. Since then, the **Insurance Development Forum**, an industry-led consortium of leading private and public sector actors, the **InsuResilience Global Partnership**, a German-led development agency committed to expanding the use of integrated insurance mechanisms, and the **Munich Climate Insurance Initiative**, a consortium of insurers, academics and NGOs hosted by the United Nations University in Bonn, have each led their respective communities in coalescing the technical skills and financial capacity to advance risk transfer solutions for the most exposed and vulnerable populations. Similarly, the **World Bank's Disaster Risk Financing and Insurance Program**, the **United Nations Development Programme's Insurance and Risk Finance Facility**, the **German Federal Ministry of Economic Cooperation and Development (BMZ)**, and a host of other multi-lateral development banks, government agencies and NGOs have applied their networks, capabilities and funding to facilitate the creation and maintenance of insurance-based solutions as alternatives to traditional humanitarian aid programs.

Individual insurers have also initiated their own efforts to expand the role insurance can play in driving innovative new risk management models. **AXA** funds a network of researchers and academics to expand the knowledge base and advance novel concepts such as sea level rise measurement tools and blue carbon resilience credits. **Guy Carpenter** has helped redefine public-private partnership by supporting countless government program efforts to

tap into private sector capacity. **Munich Re** and **Swiss Re** have issued seminal research on the importance of risk reduction and led the placement of some of the most innovative programs blending risk transfer and economic empowerment. **WillisTowersWatson** has tirelessly spearheaded the establishment of multiple leading organizations. **Zurich's Flood Resilience Alliance** represents a unique collaborative model to drive a democratized understanding of flood-related exposures and risk mitigation options. And the public-private collaboration **Flood Re** in the UK has embedded build back better concepts into their core offerings.

As a result of these and countless other efforts, insurance is increasingly recognized as an important tool in helping to reduce the gap between exposure and coverage — often referred to as the “protection gap.” The challenge, then, is not to convince industry and government leaders of something new. Rather, it is to scale these diffused industry efforts on climate risk reduction in a manner that matches the urgency — both in terms of breadth and pace — of the recent IPCC Working Group II<sup>5</sup> call to action.

In the context of climate change, pursuing such approaches poses multiple challenges to traditional insurance tools. First, the full brunt of climate exposures is still difficult to forecast and model. Second, even if insurers could precisely model future climate exposures, it is not clear whether the economics or politics of insurance markets would allow full pricing today for an exposure that manifests beyond the traditional 12-month duration of most insurance policies. And third, despite incredibly effective research and awareness organizations like the **Institute for Business & Home Safety**, individual policyholder-by-policyholder mitigation measures alone are unlikely to be sufficient to meaningfully reduce exposure to community-wide risks such as rapid sea level rise, rampant wildfires, extreme rainfalls or extended heat waves. *Systemic risks demand systemic solutions.*

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<sup>5</sup> Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report.

# The Race to Resilience Insurance Mobilization Campaign

This system-level future-oriented nature of climate risks calls for a new engagement approach from the insurance sector. Rather than rely solely on pricing the next 12 months of climate exposures, the industry must once again go the root cause of the risks and apply its core capabilities in a way that “flattens the risk curve.”

Clearly, at its core the “root” cause is the continued release of CO<sub>2</sub> into Earth’s atmosphere, and groups like the **United Nation’s Environment Programme’s Principle for Sustainable Insurance** are working with insurers and reinsurers to develop a framework for facilitating their path to net-zero underwriting. On the asset side of the ledger, groups like the **Net Zero Asset Owner Alliance** are galvanizing institutional investors — insurance being one of the largest — to reallocate capital to the technologies, sectors and projects that will accelerate the transition to a post-carbon economy.

But for insurance to remain relevant as a societal risk management tool, it must focus not just on the root cause, but also the physical manifestations of our collective failures to rein in that root cause: sea level rise, wildfire, drought, extreme heat, floods and other extreme weather events.

That is why the UN Climate Change High-Level Champions are calling on the insurance sector to find new ways to deploy their unique capabilities — namely risk finance, risk analytics, impact investing, strategic philanthropy and stakeholder engagement — to help advance community-level climate adaptation. Fortunately, many industry leaders are already blazing the path in this direction. They are sponsoring research, assembling partnerships and piloting new models that substantially de-risk investment in ex ante disaster prevention.

In the following pages you will see a sampling of these efforts; by no means comprehensive, but intended

to be illustrative of the ingenuity and impact that the insurance sector can bring to these challenges.

Our aim is to celebrate leadership and encourage others to embrace risk reduction as the foundation of sustainable risk transfer, as seen in the electricity and modern highway examples. That is why the 17 demonstration projects featured in this report focus on incentivizing or facilitating climate risk reduction efforts at both the asset and system levels. Some projects are still at the early stages and require additional insurer support to achieve their ambitious targets. Others are clear best practices that should be replicated wherever possible. All are to be commended, and on behalf of the UN Race to Resilience campaign and the UN Climate Change High-Level Champions, we applaud all project sponsors.

Our ultimate aim, however, is to facilitate risk reduction impact at scale across the sector. That is why this collaborative effort also encourages the development of an early-stage capability framework that we hope can help standardize how actors discuss and promote insurance sector engagement. By creating a common nomenclature, we can begin to encourage consistent tracking and measurement, and perhaps even set industry-level impact targets in line with the Sendai Framework, the G7 Global Shield and other multi-lateral climate adaptation initiatives.

The IPCC reports have documented the challenges we face. Our aim is to help prepare insurance sector leaders for a broader societal role in facing those challenges. Collectively, we can scale the industry’s ability to advance meaningful climate risk reduction and adaptation, and jointly pursue the innovative public-private partnerships that reflect our shared mission in protecting vulnerable populations from the physical ravages of climate change.

The UN Climate Change High-Level Champions will report on the progress of these efforts at COP28.

# The Capabilities Framework

Fundamental to any scaling effort is a common understanding of common goals. Without a consistent and agreed upon set of definitions, measurements and targets, assessing aggregate impact is challenging, if not impossible. Similarly, engaging a diverse set of industry players without a clear articulation of what is being asked creates confusion, friction and delay.

That is why this report presents an early-stage insurance sector capabilities framework as the basis for defining how the mechanics of insurance can

de-risk, accelerate or otherwise facilitate climate risk reduction efforts. Our hope is that industry leaders will review, refine and endorse such a framework in order to create a common approach to defining industry support for risk reduction and adaptation measures, thereby setting the foundation for sectoral tracking, measurement and target-setting initiatives.

Below is an illustrative example of one such capabilities framework spanning the various ways insurers can advance climate risk mitigation and adaptation measures:

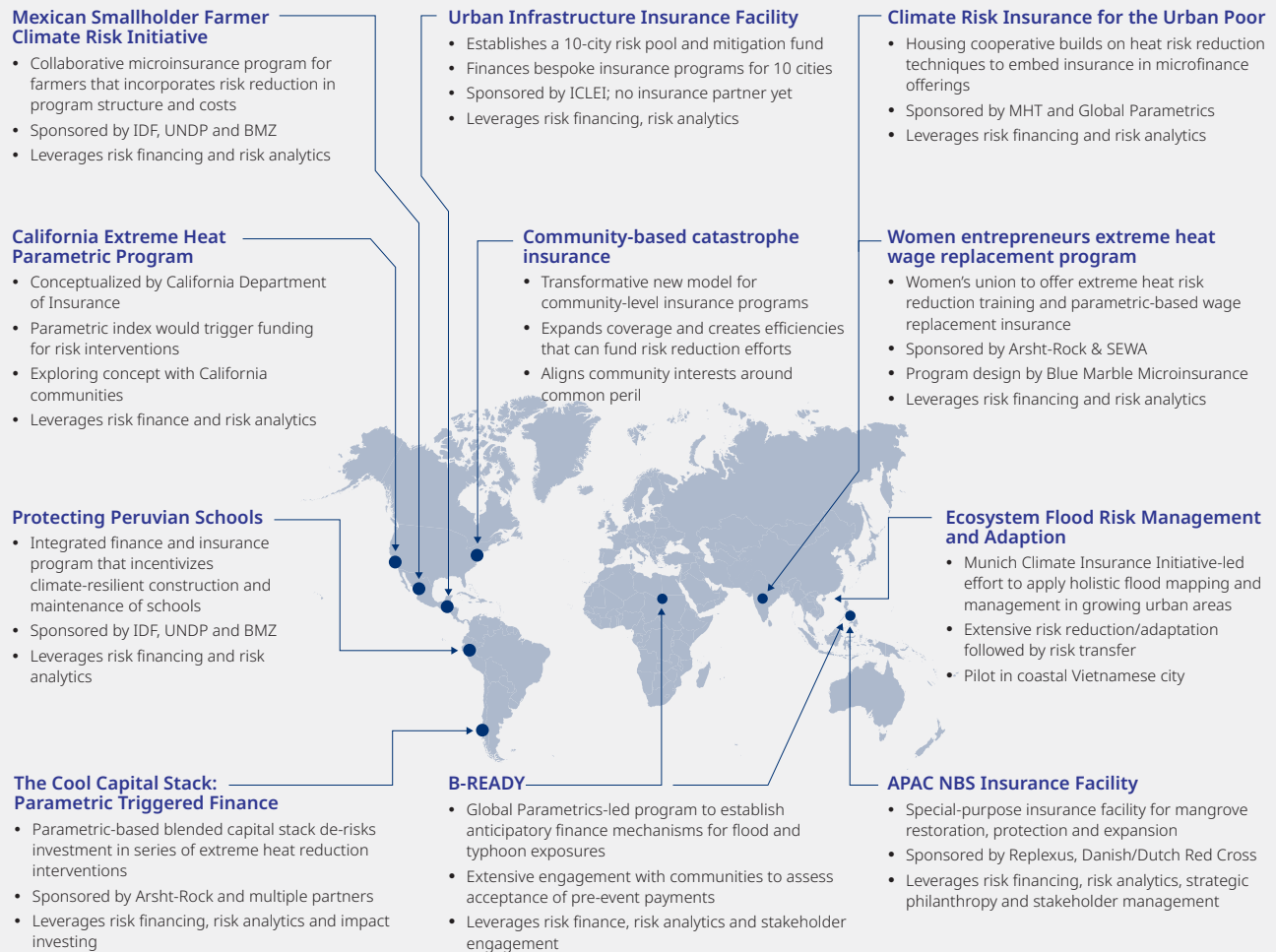
	<b>Risk Financing and Pricing</b>	<b>Risk Analytics and Expertise</b>	<b>Impact Investment</b>	<b>Strategic Philanthropy</b>	<b>Stakeholder Engagement</b>
Overview	Projects where risk transfer is a critical element to de-risking investment or incentivizing risk-reduction behaviors	Projects where risk analytics, modeling, visualization, engineering and program structure are key elements	Projects where private capital can play a catalytic role in advancing new adaptation finance models	Projects where NGOs and/or other partners require programmatic funding to pilot new approaches	Projects where policy influence, large client engagement and/or other network activation is critical to success
Examples	<ul style="list-style-type: none"> <li>• Parametrics</li> <li>• Micro-insurance</li> <li>• Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Community risk assessments</li> <li>• Mitigation options</li> </ul>	<ul style="list-style-type: none"> <li>• Muni Bonds</li> <li>• Project finance</li> <li>• Impact bonds</li> </ul>	<ul style="list-style-type: none"> <li>• NGO support</li> <li>• Partnerships</li> <li>• Catalytic funding</li> </ul>	<ul style="list-style-type: none"> <li>• Policy coalitions</li> <li>• Local risk networks</li> </ul>
Potential Tracking	<ul style="list-style-type: none"> <li>• Risk capital/limits</li> <li>• # of programs</li> <li>• # of benefitted</li> </ul>	<ul style="list-style-type: none"> <li>• Hours of analysis</li> <li>• Cost of services</li> <li>• # of benefitted</li> </ul>	<ul style="list-style-type: none"> <li>• Dollars invested</li> <li>• Benefits achieved</li> <li>• Bonds purchased</li> </ul>	<ul style="list-style-type: none"> <li>• \$\$\$ contributed</li> <li>• # of partnerships</li> <li>• # of benefitted</li> </ul>	<ul style="list-style-type: none"> <li>• # of initiatives</li> <li>• # of partners</li> </ul>



# The Pioneers

In an effort to demonstrate the various capabilities — and to recognize the leadership already being shown by many industry actors — this report includes short summaries of a series of Pioneer Projects that reflect the spirit and urgency of the UN Climate

Change High-Level Champions’ call to action. They are admittedly just a sampling of such projects, and do not claim to represent an exhaustive or definitive list of demonstration projects.



## CORE ENABLERS

### CCRI Systemic Resilience Forum

- National resilience assessment and metrics that generate investment prioritization and de-risking strategies
- Sponsored by CCRI
- Leverages risk financing, risk analytics and stakeholder management

### Flood Resilience Alliance

- Partnership applying community-based flood risk assessment tool to identify and manage flood exposures
- Sponsored by Zurich, IFRC, Mercy Corps, LSE, IIASA
- Leverages risk analytics and stakeholder management

### Coastal Risk Index

- Methodology for coastal communities to identify, monitor and mitigate against sea level risk exposures
- Sponsored by ORRAA and AXA
- Leverages risk analytics and stakeholder engagement

### Global Actuarial Initiative

- Milliman and UNDP to engage 20 developing nation markets in expanding actuarial capacity
- Extensive engagement of academia, governments, industry and social administration agencies
- Initial countries include Egypt, Sierra Leone and Colombia

### Community Disaster Resilience Zones

- RAA-led policy initiative to identify and support most climate vulnerable US communities
- Second phase to pursue tax incentives for private sector investment

### Global Risk Modelling Alliance

- Global effort to democratize and expand available risk modelling for highly exposed geographies
- Sponsored by IDF, UNDP and BMZ
- Leverages risk analytics and stakeholder management

To provide a consistent understanding of the projects, as well as to add context and meaning to the five proposed industry capabilities, each summary includes the following items: a map illustrating geographic focus, a series of spider-gram charts measuring the utilization of each industry capability, an overview of anticipated impact, a description of the current state of each project,

and contact information for those who want to learn more.

Industry supporters of this effort are encouraged to seek ways to support the full implementation of these projects, as well as to forge new projects that deploy the many innovative concepts reflected in these initiatives.

## References

Armstrong McKay DI, Staal A, Abrams JF, Winkelmann R, Sakschewski B, Loriani S, Fetzer I, Cornell SE, Rockström J, Lenton TM. — Exceeding 1.5°C global warming could trigger multiple climate tipping points. *Science*. 9 September 2022.

IPCC, *Climate change: a threat to human wellbeing and health of the planet.*, posted on 28 February 2022.

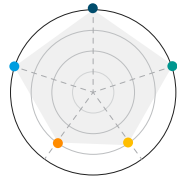
Christian Aid, “Counting the cost 2021: a year of climate breakdown,” 2021.

Global Center on Adaptation, *Financial Innovation for Climate Adaptation in Africa*, 2022.

# Index of pioneer projects

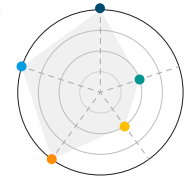
## APAC NBS Insurance Facility

Replexus-led effort to create insurance pools for mangrove forests in the Philippines as the start of a new class of Humanitarian Insurance Linked Securities.



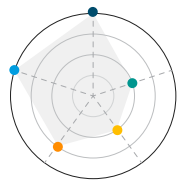
## B-READY

Global Parametric-sponsored initiative to develop and deploy anticipatory finance parametric products covering flood and typhoon risk in the Philippines, Sudan and Indonesia.



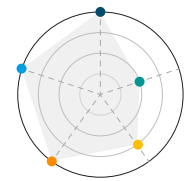
## California Extreme Heat Parametric Program

California Department of Insurance is promoting a concept to develop parametric insurance programs for communities exposed to extreme heat challenges where payouts would be specifically dedicated to pre-defined heat interventions and relief mechanisms.



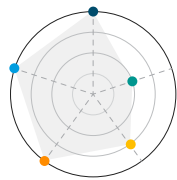
## Climate Risk Insurance for the Urban Poor

Global Parametrics is working with the Mahila Housing Trust to extend their heat and flooding risk abatement efforts to include microinsurance availability.



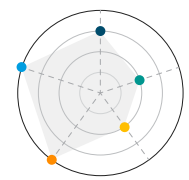
## Community-Based Catastrophe Insurance

Guy Carpenter and others are promoting group-type catastrophe insurance policies to expand coverage, reduce costs and jointly fund community level risk reduction interventions.



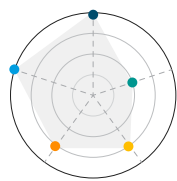
## Ecosystem Flood Risk Management and Adaption

Munich Climate Insurance Initiative led effort to develop city/watershed level flood understanding to develop effective flood mitigation and insurance solutions in a rapidly expanding city environment.



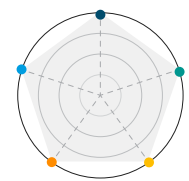
## Mexican Smallholder Farmer Climate Risk Initiative

IDF-led program to provide vulnerable farmers in Mexico with microinsurance coverage and incentives to implement risk reduction measures.



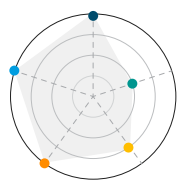
## The Cool Capital Stack: Parametric Triggered Finance

The Extreme Heat Resilience Alliance is in discussions with Marsh modelers about establishing a parametric index that utilizes multiple trigger points to mobilize multiple capital sources to support and complement heat-resilience interventions. The program could be piloted in Santiago, Miami and/or Athens.



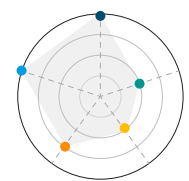
## Protecting Peruvian Schools

IDF-led effort to embed climate risk awareness into the location and construction of public schools, and to insure up to 40,000 facilities.



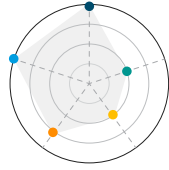
## Urban Infrastructure Insurance Facility

ICLEI-sponsored 10-city Latin American program to provide risk analytics capacity, risk mitigation input/advice and subsidized insurance programs for 10 cities, all complemented by a regional risk pool.



## Women entrepreneurs extreme heat wage replacement program

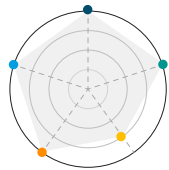
Blue Marble is engaging with SEWA to blend tech-enabled heat risk awareness and mitigation techniques with a parametric insurance program that covers credit payments affected by extreme heat episodes.



## Core enablers

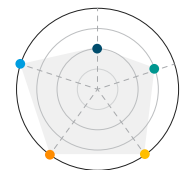
### CCRI Systemic Resilience Forum

Willis-led effort to develop analytical tools and methodologies to help national governments assess climate exposures holistically and then to leverage those insights to prioritize infrastructure investments.



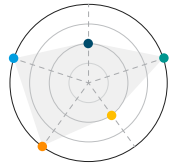
### Coastal risk index

AXA-led effort to create an analytical tool for coastal communities to model future exposures and assess mitigation options.



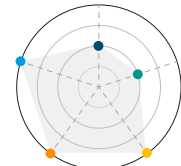
### Community Disaster resilience zones

Reinsurance Association of America-sponsored legislation establishing government-designated resilience zones that would be eligible for enhanced capacity building and funding, as well as potential tax incentives to attract private sector investment in local risk reduction initiatives.



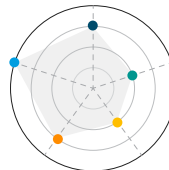
### Global Actuarial Initiative

Milliman-sponsored effort to expand actuarial capacity and talent in 20 developing countries.



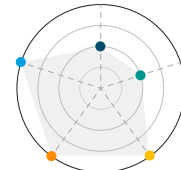
### Global Risk Modelling Alliance

Co-developed by the IDF and the V20 Group of Ministers of Finance, GRMA is public-good service that offers climate-vulnerable nations open data, technology and expertise for the development of climate risk management strategies and applied risk finance projects.



### Zurich Flood Resilience Alliance

Zurich-led initiative to apply a new community risk tool to engage flood-vulnerable communities in an in-depth dialogue on flood exposures and options.



● Risk Analytics ● Risk Finance ● Impact Investing ● Stakeholder Engagement ● Strategic Philanthropy



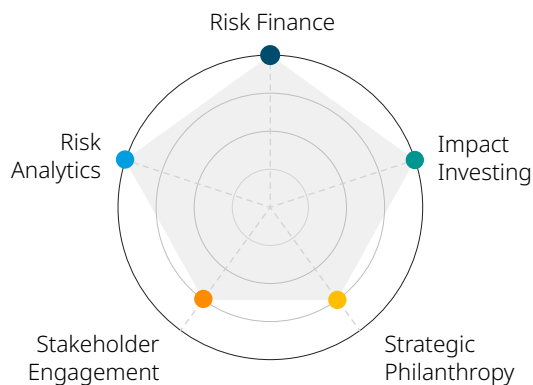
# **Project Summaries**

# APAC NBS Risk Reduction and Insurance Facility

## Overview



- Sponsored by Danish Red Cross, Philippine Red Cross, Netherland Red Cross, Replexus and Base Carbon
- Dedicated facility to finance and insure nature-based climate risk reduction solutions
- Risk finance, risk analytics, strategic philanthropy, and stakeholder engagement



The Danish Red Cross, Netherlands Red Cross, Replexus, and Base Carbon have developed the Asia Pacific Nature Based Risk Reduction & Insurance Facility.

The blended financing facility covers multiple nature-based solutions, such as mangrove forests, that protect and buffer communities from the impacts of natural disasters.

The Asia Pacific Nature Based Risk Reduction & Insurance Facility enables capital market investors to contribute to climate adaptation efforts, through the development of a structure designed to benefit both

the humanitarian sector and commercial investors. In particular, the Facility serves as an umbrella organization to support trust funds established to benefit communities and pay premiums for climate-related catastrophe coverage.

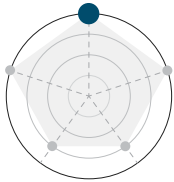
The goal is to help evolve the funding paradigm under which organizations like the Red Cross work, by moving away from a purely grant funded approach to one that is blended and encourages capital market participation.

The first project from the Facility is called the Mangrove Trust Fund and seeks to finance the restoration and reforestation of up to 30,000 hectares of mangroves in the Philippines. At the heart of the Facility is a trust fund where proceeds are pooled from four revenue streams. These revenue streams correspond to specific input activities, for example planting mangroves generates revenues from selling call options or warrants on associated carbon credits; or paying an annual insurance premium for the tropical typhoon catastrophe bond cover that protects the newly planted mangroves and related coastal communities.

# Insurance Capabilities Index

## Risk Finance

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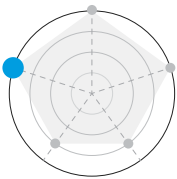
Protection of the mangroves in the Philippines will be by way of a humanitarian insurance-linked securities (HILS) protection:

- **Peril:** pacific cyclone
- **Anticipated Limits:** TBC
- **Period:** likely 3 years
- **Triggers:** parametric, TBC

Further the Facility is considering establishing a specific catastrophe bond fund, that would only invest in HILS, such as the already issued volcano cat bond, this new Philippines Mangrove Bond and any issued using this new nature-based financing approach.

## Risk Analytics

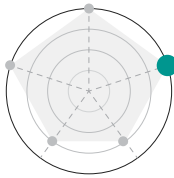
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The Facility requires significant data, analytics and modelling of asset-specific (i.e. a mangrove forest) exposures to Pacific cyclone risks. In addition, the program structure requires extensive experience in setting the parametric triggers and pricing for insurance linked securities.

## Impact Investing

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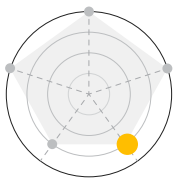


The Facility would enable private sector capital to support nature-based solutions through investments in dedicated insurance-linked securities and other vehicles supporting the creation and maintenance of such projects.

Replexus aims to create a market for humanitarian insurance-linked securities (HILS) by establishing similarly structured programs for other social causes. They have already launched a volcanic eruption program in partnership with the Danish Red Cross and Mitiga Solutions and are actively assessing an Indonesian watershed and storm surge program.

## Strategic Philanthropy

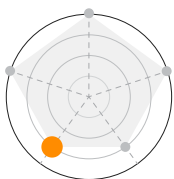
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The ultimate goal is to raise donor funding to support maintenance and management of nature-based resilience solutions, such as mangrove forests, while also funding issuance of humanitarian insurance-linked securities (HILS).

## Stakeholder Engagement

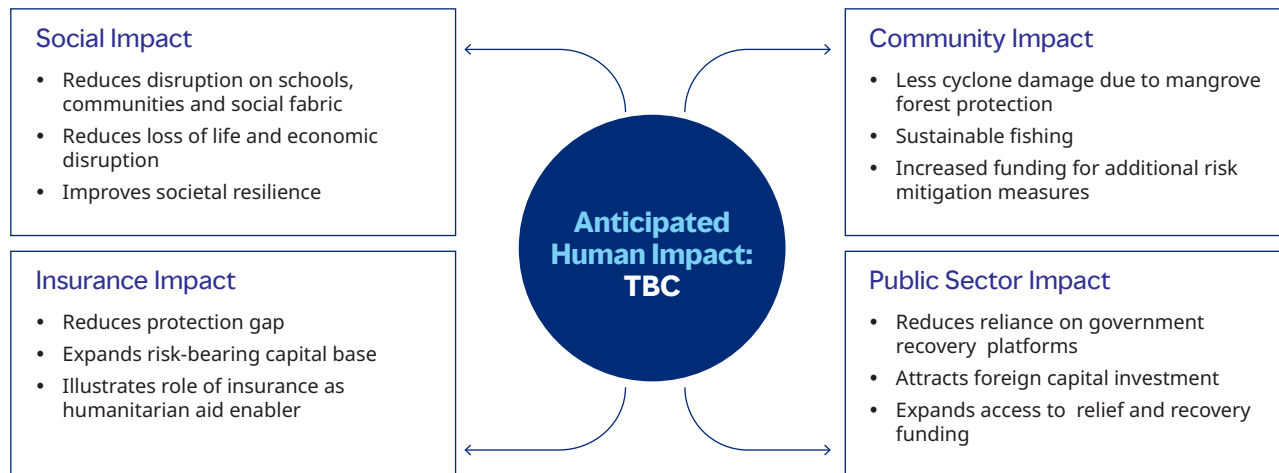
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With capital market interest growing in credible and impactful ESG investment opportunities there is a significant opportunity to leverage the HILS model with humanitarian organizations seeking to crowd-in new capital sources and de-risk investments in nature-based solutions.

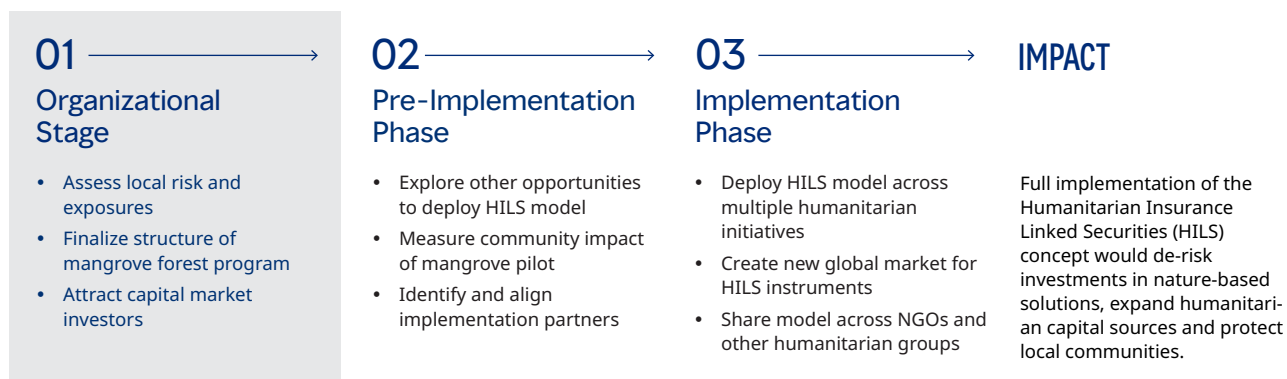
# Impact

Full implementation of the APAC NBS Risk Reduction and Insurance model would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Facility has received initial grant funding from two donors and up to US\$10 million in project financing from Base Carbon. Marketing the typhoon cat bond to ILS investors will likely begin in December 2022.



# Key Contacts

To learn more about supporting the Facility please contact:

**Cedric Edmonds**  
 Chief Executive Officer  
 Replexus  
 cedric.edmonds@replexus.co.uk

**Adam Bornstein**  
 Lead, Innovative Finance  
 Danish Red Cross  
 adb@rodokors.dk

**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
 francis.bouchard@mmc.com



# B-READY

## Overview



- Sponsored by Dutch Relief Alliance, Plan International, Oxfam and Global Parametrics
- Promotes anticipatory finance approach in vulnerable locations
- Blends forecasting, risk reduction actions and parametric-based anticipatory finance
- Risk finance, risk analytics, and stakeholder engagement
- Currently in second phase



B-READY is a ground-breaking effort to use parametric-based anticipatory finance and community-led climate risk assessments to advance financial inclusion, crowd-in private finance and facilitate pre-emptive risk mitigation actions. The program's first phase focused on nine villages in Salcedo, a municipality in the Eastern Samar province of the Philippines. They began by assessing typhoon exposures in the various communities, which led to the initial development of a traditional parametric insurance program that issued almost 2,000 payouts within three days of Typhoon Ursula. Building on

the trust generated by the successful program, B-READY then conducted event simulations testing the receptivity and anticipated value of pre-emptive anticipatory payments based on typhoon and flood warnings. Results were highly encouraging as participants suggested that the anticipatory payout heightened their awareness of early warning signals and provided a strengthened sense of empowerment and dignity.

The parametric insurance program was then restructured to focus on providing beneficiaries cash payments that they could use to protect their families and businesses before a typhoon arrives. And in February 2021, 1,655 beneficiary families received the equivalent of \$30 the day before Typhoon Dujan was forecast to hit their region.

The approach has been recognized as so valuable that the Salcedo Legislative Council formally recognized the parametric index as the basis for pre-emptive disaster response, and the 2019 SEEP Annual Conference awarded B-READY its best innovation challenge.

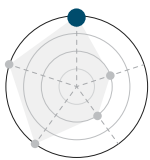
Phase II of the project kicked off in April 2021 with an expansion of the program to 30 additional villages across the Philippines as well as new initiatives in North Dafur, Sudan and Indonesia. Since then, the program has issued pre-emptive payments to facilitate risk reduction efforts before a flood in Cotabato City and before Typhoon Odette.

The project partners each bring their unique strengths to this project: Global Parametrics focuses on the development of the forecast index; Oxfam Philippines conducts the on-the-ground training and identifies key community stakeholder; Plan International deploys the monitoring and other safeguard measures; and the Oxfam Novib consortium conducts the convening and facilitation.

## Insurance Capabilities Index

### Risk Finance

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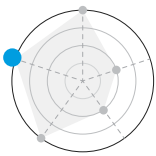


B-READY relies on sophisticated parametric index triggers that balance the intensification of the peril with the ability of beneficiaries to take risk mitigation action.

- **Peril:** flood, typhoon
- **Anticipated Limits:** roughly \$30-\$35 per payout
- **Period:** annual
- **Triggers:** index-based

### Risk Analytics

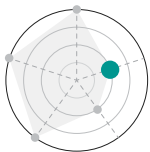
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B-READY's parametric basis requires extensive risk assessment and modeling to identify the appropriate trigger mechanisms. Recognizing the lack of credible long-term data in some geographies, the program conducts community-based research to identify risk factors and mitigation options.

### Impact Investing

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The aim is to facilitate and encourage private and public investment in risk mitigation measures based on the B-READY modelling and risk assessments.

### Strategic Philanthropy

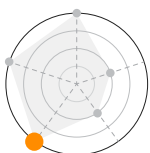
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The project is funded and staffed by a combination of Plan International, Oxfam, Dutch Relief Alliance and Global Parametrics.

### Stakeholder Engagement

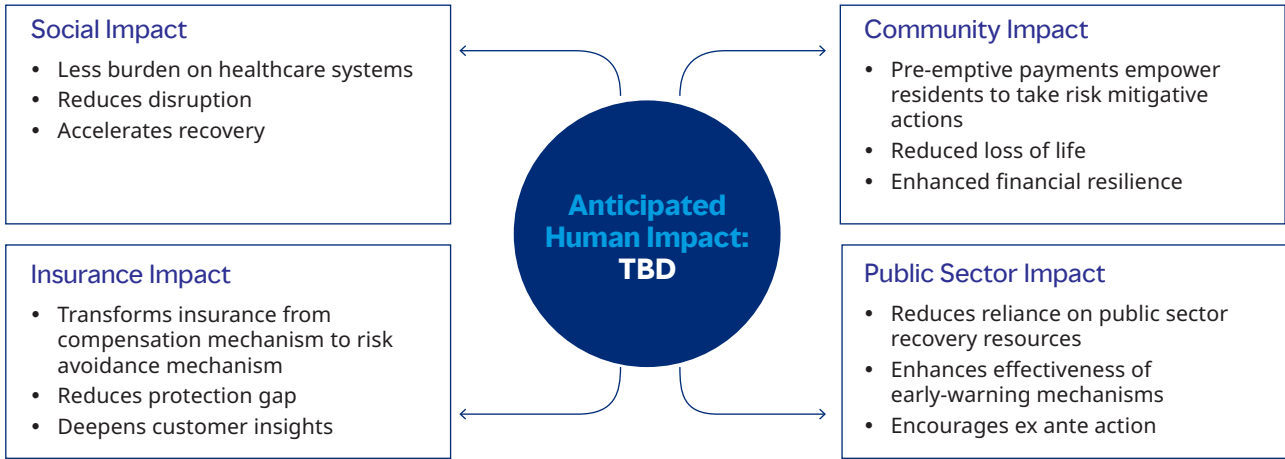
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In order to further develop the Parametric Program extensive engagement with local governments and communities is required.

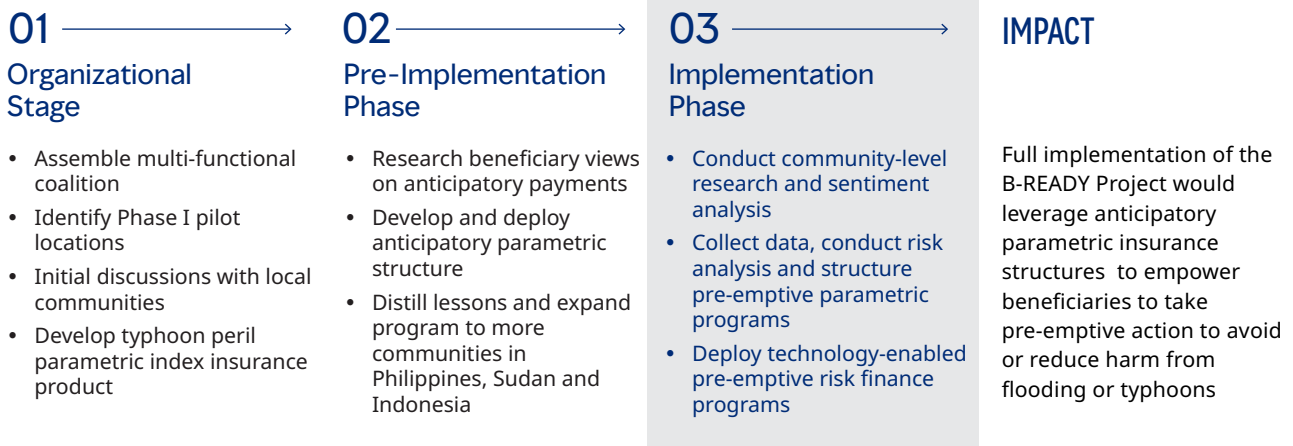
# Impact

Full implementation of the B-READY Program would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

B-READY is now in its second phase of expansion, creating opportunities for new industry participants to get engaged.



# Key Contacts

To learn more about supporting the B-READY program please contact:

**Wendy Smith**  
Impact and ESG Manager  
Global Parametrics  
wsmith@globalparametrics.com

**Maria Theresa Nina Espinola-Abaogado (she/her)**  
Senior Manager  
Oxfam in the Philippines  
MAbogado@oxfam.org.uk

**Francis Bouchard**  
Managing Director, Climate  
Marsh McLennan  
francis.bouchard@mmc.com

# California Extreme Heat Parametric Program

## Overview



- Conceptualized by California Department of Insurance
- Parametric-based extreme heat insurance for communities
- Complements state reforms
- Risk finance and risk analytics
- Early-stage community discussions



The California Department of Insurance Community Heat Program is an early-stage concept that focuses on using insurance as a means of reducing and transferring risk associated with extreme heat. The concept explores the possibilities of a parametric insurance approach to aid local governments, Tribes, and public health agencies in order to avert the most acute impacts posed by extreme heat.

The core of the concept focuses on the development of a parametric insurance policy to protect communities from acute risks associated with extreme heat. It would be activated when agreed upon triggers are met and would provide funds to support communities in preparing for and responding to heat emergencies.

The proposed concept aims to transform heat preparedness efforts at the neighborhood and community level by uniting risk reduction and recovery planning. It provides the dual benefits of risk reduction, by covering costs of preparedness rather than just losses, and risk transfer, through coverage of expenses and losses associated with disaster response.

From an insurance-sector capabilities perspective the program relies heavily on risk finance expertise, with significant stakeholder engagement anticipated. Impact investing and strategic philanthropy are still under consideration.

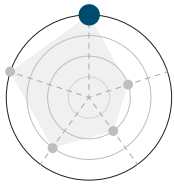
The initiative is another reflection of California's proactive approach to managing extreme heat exposures, and follows recent enactment of ground-breaking legislation that establishes a new naming protocol for heat waves and funds aggressive risk mitigation action across several government agencies.

The California DOI is seeking implementation partners to work with individual communities.

# Insurance Capabilities Index

## Risk Finance

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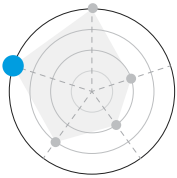


The California Department of Insurance Community Heat program proposes to develop parametric insurance policies to protect communities from acute risks associated with extreme heat. It would be activated when agreed upon triggers are met and would provide funds to support communities in preparing for and responding to heat emergencies.

- **Peril:** extreme Heat
- **Anticipated Limits:** TBC
- **Period:** annual
- **Triggers:** index-based

## Risk Analytics

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Extensive knowledge of local heat risks, data sources and trigger mechanisms required. Demonstrated experience developing and implementing parametric programs critical.

## Impact Investing

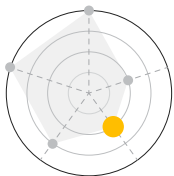
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Impact Investing is not currently a focus.

## Strategic Philanthropy

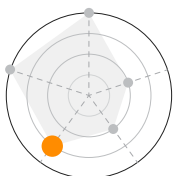
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Strategic philanthropy is not contemplated in the pilot phase.

## Stakeholder Engagement

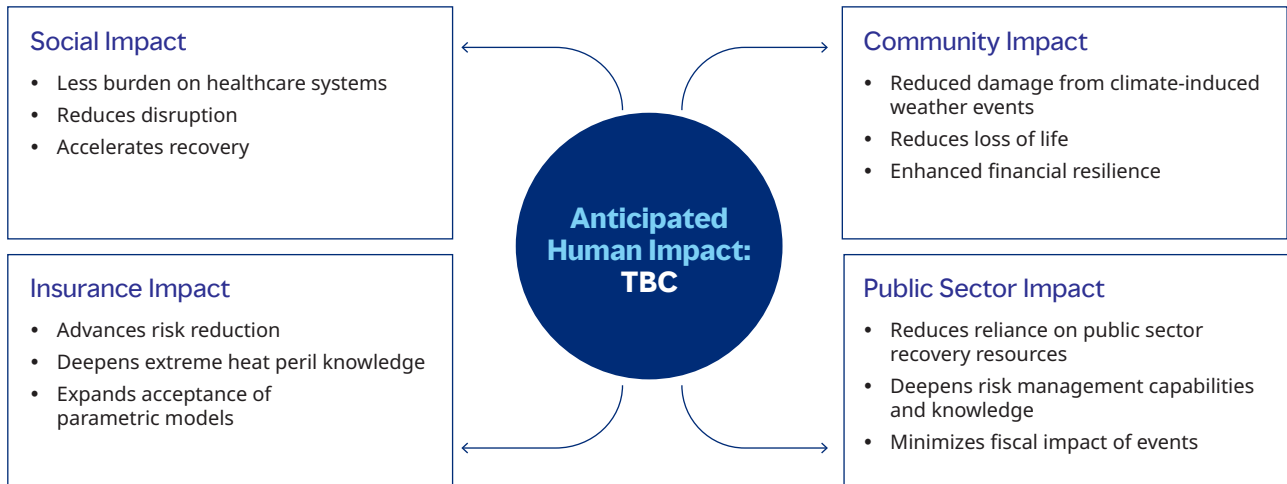
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In order to further develop the Parametric Program extensive engagement with local governments and communities will be required, as will close collaboration with the Department of Insurance.

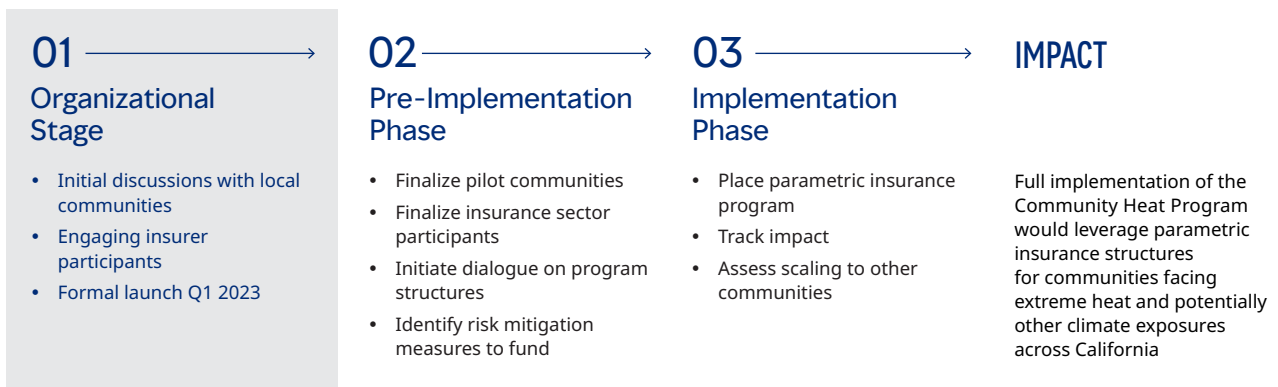
# Impact

Full implementation of the California DOI Community Heat Program would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Community Heat Program is still in the organizational stage with hopes of launching a pilot early in 2023. Opportunities exist for new industry participants to get engaged.



# Key Contacts

To learn more about supporting the California Community Heat Program please contact:

**Deborah Halberstadt**  
 Senior Climate Policy Advisor  
 California Department of Insurance  
 Deborah.halberstadt@insurance.ca.gov

**Rabab Charafeddine**  
 Climate Risk Specialist  
 California Department of Insurance  
 Rabab.charafeddine@insurance.ca.gov

**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
 francis.bouchard@mmc.com

# Climate Risk Insurance for the Urban Poor

## Overview



- Design and implementation by Mahila Housing Trust in partnership with Global Parametrics
- Index-based portfolio insurance for heat and flood perils
- Risk finance, risk analytics and stakeholder engagement
- Program is extension of extensive risk mitigation strategy
- The two-cooperative pilot expected to benefit 125,000 people; full implementation targeting 1.25 million beneficiaries by 2025



This program seeks to provide insurance covering extreme heat and flooding risks for women entrepreneur borrowers in highly exposed Indian cities. The program is designed by the Mahila Housing Trust (MHT), one of the leading urban development organizations in India promoting sound housing, habitats and living environments of poor women in the informal sector. Eighty percent of India's workforce is in the informal sector, most of whom are women and many of whom

use their homes as a workplace and warehouse. Housing/ habitat (surroundings) are not only a form of social security but a means for economic productivity. Climate risks like flooding/inundation and heat/heatwaves are thus mediated through the housing and habitat. MHT has already instituted a comprehensive risk reduction/prevention program across its housing and finance operations (including urban forests and dredging), and now wants to add a loss and damage offering to their clients. The program would utilize an index-based parametric to insure borrowers from MHT's extensive network of cooperative lenders. Covered perils would include extreme heat and flooding. The pilot has started with two initial cooperatives but then plans to build to 10 cooperatives in five years.

The current focus is to collect granular data on the respective perils and to identify/deploy appropriate trigger mechanisms. MHT is also undertaking extensive field work, surveys, focus groups and risk communications assessments to inform program design, in addition to engaging directly with the

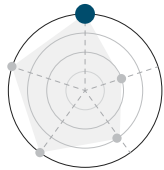
credit cooperatives on the importance of insurance options. Global Parametrics and Hannover Re are working with MHT to conduct risk analyses, structure the parametric and access insurance capacity. Anticipated placement would be in 2023.

From an insurance-sector capabilities perspective the program relies heavily on risk financing and risk analytics expertise, as well as stakeholder engagement. Impact investing and strategic philanthropy are still under consideration.

## Insurance Capabilities Index

### Risk Finance

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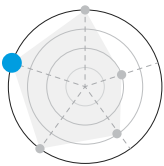
Program seeks to establish index-based coverage for MHT's micro-finance loan portfolios exposed to extreme heat and flooding.

- **Peril:** extreme heat and flooding
- **Anticipated Limits:** to be determined
- **Period:** one year policies
- **Triggers:** to be determined

Initial capacity to be provided by a combination of the UK and German government-supported Natural Disaster Fund and Hannover Re.

### Risk Analytics

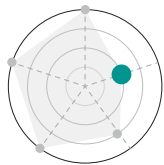
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Extensive knowledge of local heat and flood risks, data sources and trigger mechanisms required. Demonstrated experience developing and implementing parametric programs critical. Global Parametrics is providing these services.

### Impact Investing

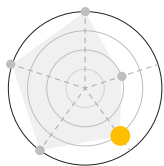
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Not currently considered.

### Strategic Philanthropy

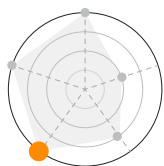
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Funding for this project has been provided by the NDF Technical Assistance Facility, a KfW program managed by Global Parametrics.

### Stakeholder Engagement

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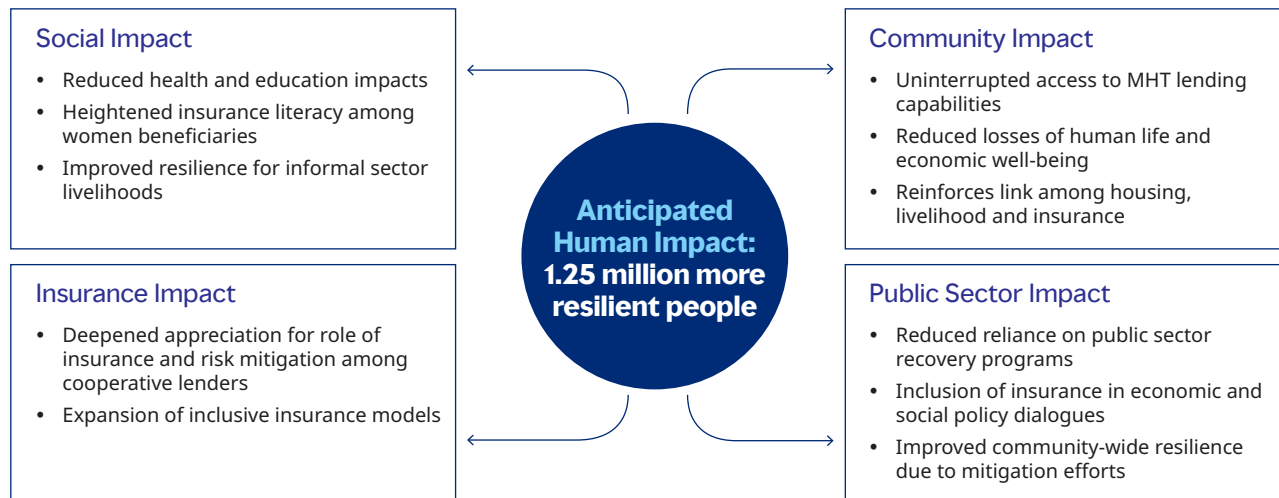


Extensive engagement with cooperatives and beneficiaries. Field work, surveys, focus groups and risk communications assessments will inform program design. In addition, MHT and the credit cooperatives serving their clients have conducted a study to assess the perception of climate risks and insurance options.



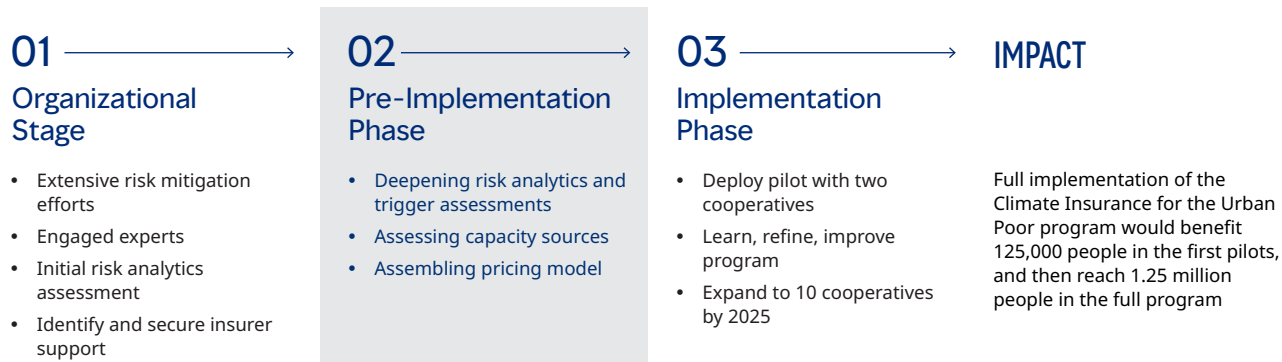
# Impact

Full implementation of the Climate Risk Insurance for the Urban Poor would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The MHT, in partnership with Global Parametrics, has proceeded steadily assembling this program. It's strategy, objectives and governance mechanisms (including funding) have been finalized, and it is now working to finalize the program structure, analytics and pricing. MHT hopes to implement the program in 2023.



# Key Contacts

To learn more about supporting MHT or the Climate Risk for Urban Poor program please contact:

**Bijal Brahmbhatt**  
 Director  
 Mahila Housing Trust  
 bijalb@mahilahsg.org

**Wendy Smith**  
 Impact and ESG Manager  
 Global Parametrics  
 wsmith@globalparametrics.com

**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
 francis.bouchard@mmc.com

# Community-Based Catastrophe Insurance

## Overview



- Sponsored by Guy Carpenter
- Risk finance, risk analytics and stakeholder engagement
- Expands insurance coverage and finances risk reduction
- Group policy model to align interests and finance risk interventions
- Funded by public sector and local inhabitants, can be tailored to assist underserved communities



Community-based catastrophe insurance (CBCI) is a potentially transformative approach to aligning communities around common perils. By migrating peril-specific insurance purchasing from an individual to a group-level decision, the mechanism aims to leverage administrative efficiencies and risk pool diversification to dramatically expand insurance coverage and finance risk reduction interventions. Guy Carpenter is pursuing a pilot project in New York City aimed at using parametric triggers to provide flood coverage to lower income residents.

Under the model, homeowners benefit from a CBCI program for all or a portion of a stated climate peril (flood or earthquake, for example) by a group insurance policy, typically purchased by a local government agency or community organization. The community-based underwriting approach reduces administrative, risk financing and distribution costs, opening up both risk reduction and risk transfer options.

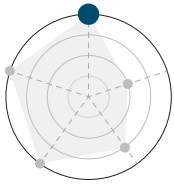
Common challenges facing the scaled deployment of the CBCI model include establishing the charter and mechanism to formalize the authority to implement such arrangements, municipal-level procurement rules, the regulatory treatment of parametric risk products and conflicting incentives established at the national or sub-national level.

Marsh McLennan, together with other leading risk capital providers, has been proactively promoting the innovative model to communities, regulators and policymakers, and are seeking additional partners to broaden understanding and deployment of the approach.

# Insurance Capabilities Index

## Risk Finance

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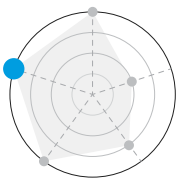


CBCI requires extensive peril-specific knowledge at the community or system level. Complex risk assessment, modelling, and pricing expertise required to assemble program structure:

- **Peril:** flood, sea level rise
- **Anticipated Limits:** vary depending on community needs (\$1 to \$100M+)
- **Period:** annual or multi-year policies possible
- **Triggers:** to be determined based on community and peril

## Risk Analytics

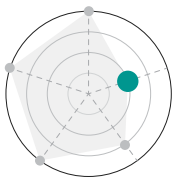
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Capabilities in risk data, assessment, modelling and visualization required to ensure maximum transparency when engaging public sector and individual community members. In addition, deep expertise in risk engineering and risk mitigation required to develop/pursue appropriate risk reduction intervention.

## Impact Investing

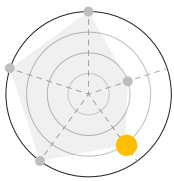
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Not an initial priority, could develop as funding source for risk reduction interventions as participating communities scale deployment of anticipated federal adaptation funding.

## Strategic Philanthropy

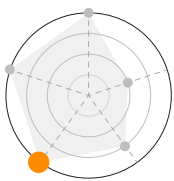
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Initial research, pilots and program structures will likely require some philanthropic support, particularly in lower-income communities. Generally, though, the model is designed to be sustainable and fully funded through collective premium collections.

## Stakeholder Engagement

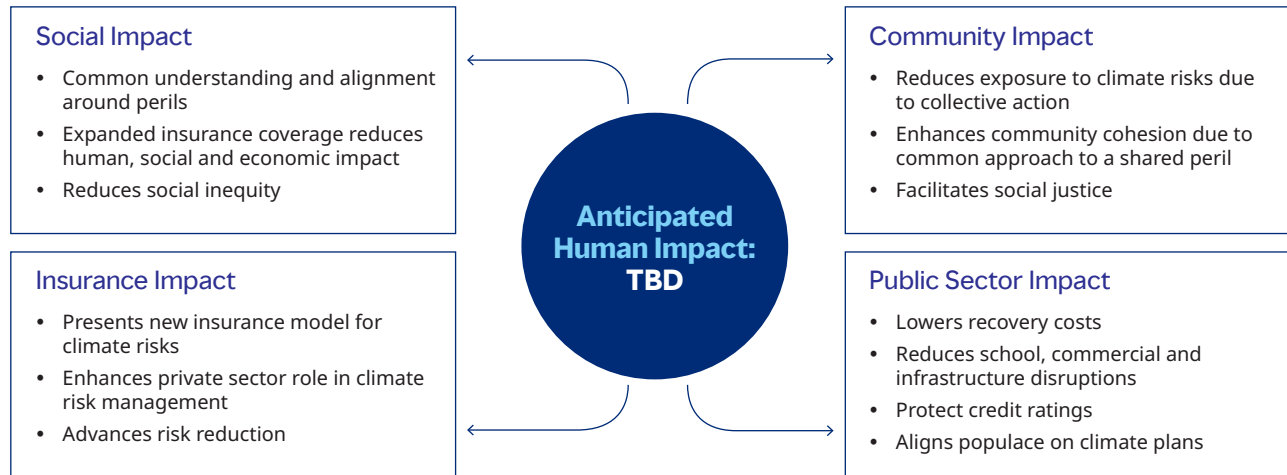
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CBCI can be seen as an alternative means to communicate risk to similarly exposed constituents, including innovative risk management strategies that rely less on post-event debt financing, federal disaster relief or charitable donations.

# Impact

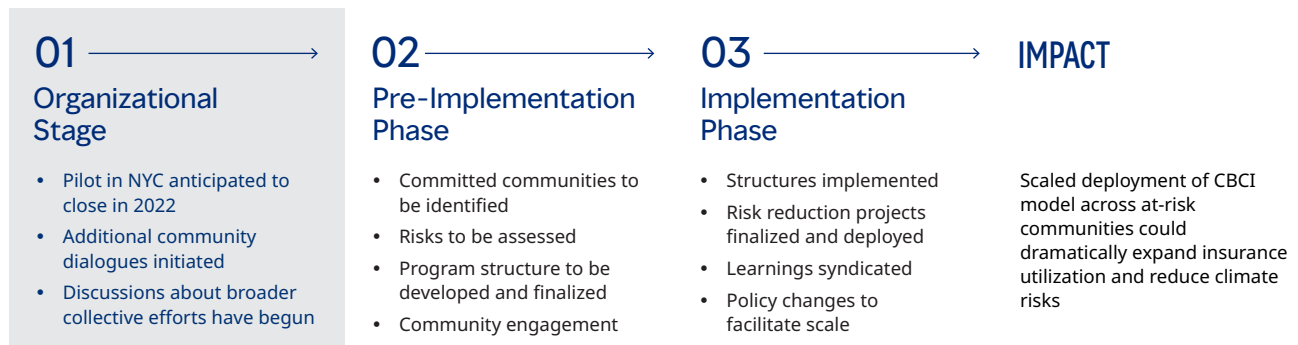
Full implementation of the Community-Based Catastrophe Insurance model would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The movement to advance CBCI is just starting to gain momentum as the initial NYC pilot is finalized and the industry dialogue on climate risks escalates. Insurers interested in exploring and/or advancing CBCI models in their markets should contact the sponsors below.

Guy Carpenter and other leading risk capacity providers have been the most visible advocates for the approach, but other expressions of support would be welcome and appreciated.



# Key Contacts

To learn more about supporting Community-Based Catastrophe Insurance please contact:

**Jake Clark**  
 Managing Director  
 Guy Carpenter  
[jonathan.clark@guycarp.com](mailto:jonathan.clark@guycarp.com)

**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
[francis.bouchard@mmc.com](mailto:francis.bouchard@mmc.com)

# Ecosystem Flood Risk Management and Adaptation

## Overview



- German Aerospace Center with consortium members including the Munich Climate Insurance Initiative and United Nations University
- Funded by the German Federal Ministry of Education and Research
- Long-term project to assess current and future flood risk and ecosystem-based approaches to flood management
- Risk analytics, risk finance and stakeholder engagement
- Focuses on coastal urban areas in central Vietnam



This collaborative project, called Integrating Ecosystem-Based Approaches into Flood Risk Management for Adaptive and Sustainable Urban Development in Central Viet Nam (or FloodAdaptVN), seeks to generate and deploy knowledge-based solutions to rapidly urbanizing, flood-prone and low-lying coastal areas.

The project's focus is the City of Hue, a rapidly growing mid-sized coastal city expanding its land use planning while experiencing significant increases in rainfall and coastal flooding.

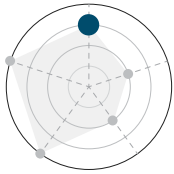
The project takes a holistic and transdisciplinary approach to understanding and managing flood risks and potential adaptive measures. It seeks to research the drivers, spatial patterns, and dynamics of present-day and future flood risks. Entry points for system-level risk reduction techniques, particularly ecosystem-based approaches and risk transfer solutions, are investigated. Ultimately, the project aims to co-develop a decision support tool for risk-informed urban planning to anticipate and prioritize different risk transfer and adaptation options.

The six-year joint project (2019-2025), coordinated by the German Aerospace Center (DLR), builds on a strong network with consortium members of local and global research and implementation organizations, including the Munich Climate Insurance Initiative (MCII), the United Nations University (UNU-EHS), Hue University of Sciences (HUSC) and other institution

# Insurance Capabilities Index

## Risk Finance

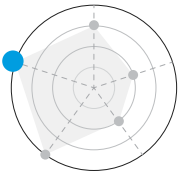
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The FloodAdaptVN project will develop innovative risk transfer solutions after conducting a multi-criteria evaluation of disaster risk reduction and adaptation options.

## Risk Analytics

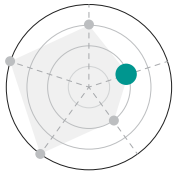
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This project applies risk analytics, focusing on flood hazard assessments. In addition, different scenario frameworks addressing urban and socio-economic growth will be developed and aligned with local land-use and master planning.

## Impact Investing

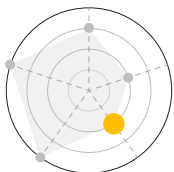
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Not currently a focus.

## Strategic Philanthropy

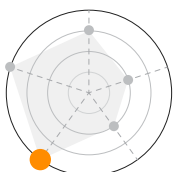
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The project is funded by the German Federal Ministry of Education and Research (BMBF) as part of its Sustainable Development of Urban Regions (SURE) program.

## Stakeholder Engagement

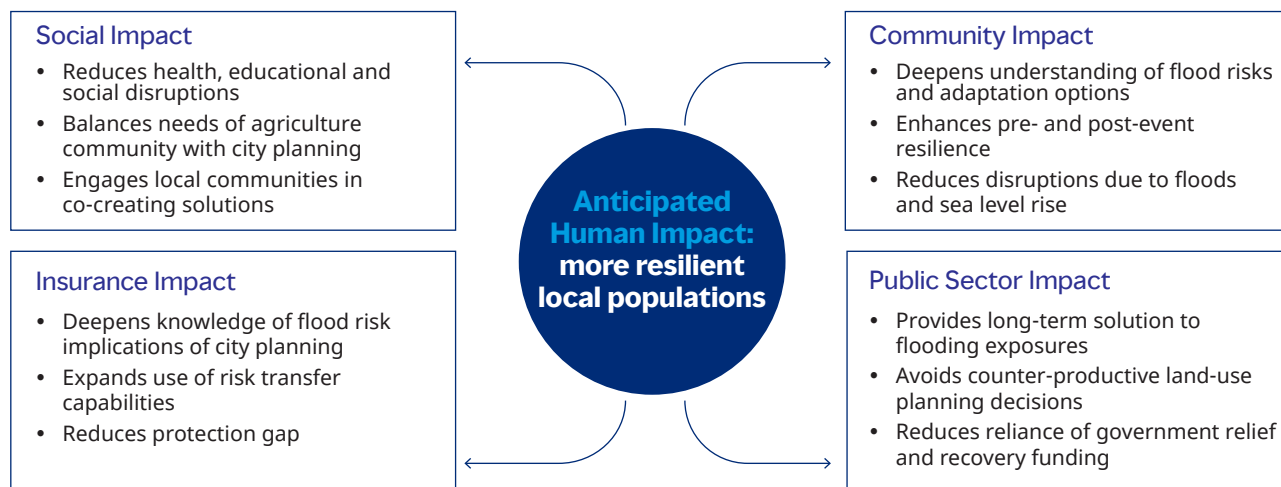
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The project relies heavily on extensive local engagement, both in terms of understanding and assessing risk, and in engaging local land use planners and government officials.

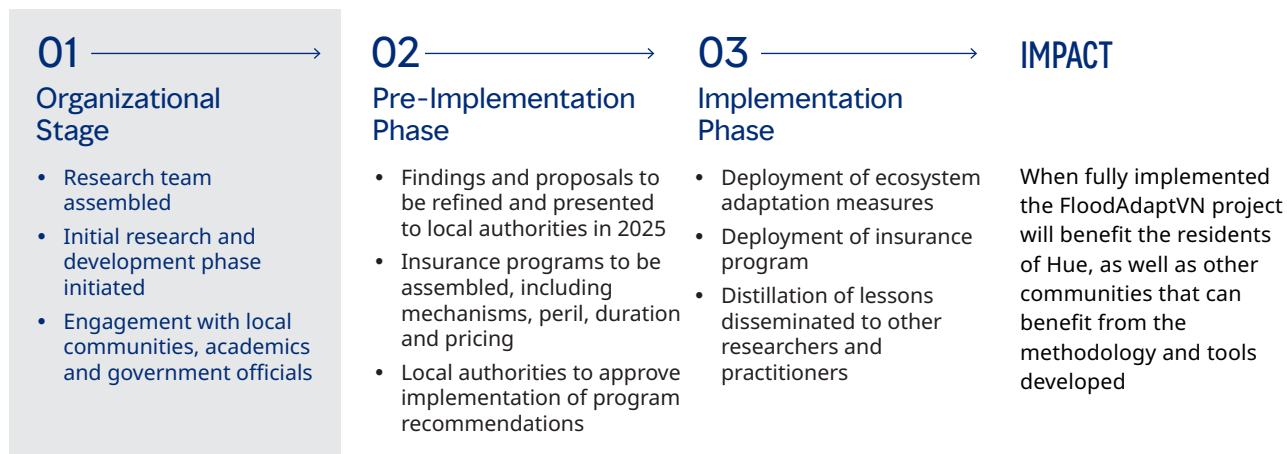
# Impact

Full implementation of the FloodAdaptVN project will generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

In order to actively engage all relevant stakeholders a participative co-development will be designed and applied. An intensive cooperation of local stakeholders and the Vietnamese-German research team will be ensured to deliver research results of FloodAdaptVN accordingly to the requirements and technical conditions of the local “end-users.” In order to facilitate the exchange and interaction between all parties, annual co-development workshops are conducted.



# Key Contacts

To learn more about supporting the FloodAdaptVN project please contact:

**Dr. Maxime Souvignet**  
 Analytics Team Lead  
 Munich Climate Insurance Initiative (MCII), United Nations University (UNU-EHS)  
 souvignet@ehs.unu.edu

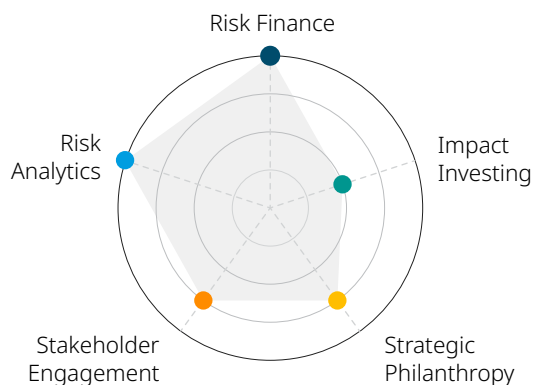
**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
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# Mexican Smallholder Farmer Climate Risk Initiative

## Overview



- Sponsored by IDF, funded by InsuResilience Solutions Fund
- Provides catastrophic climate cover for Mexican farmers with <5 hectares
- Risk finance, risk analytics, stakeholder engagement, and strategic philanthropy
- Training provided on risk reduction measures as part of enrollment



The Mexican Smallholder Farmer Climate Risk Initiative is one of the 20 projects being pursued by the Tripartite arrangement between the Insurance Development Forum (IDF), the BMZ and the UN Development Programme (UNDP). The program is currently in a pilot phase with roughly 10,000 farmers in 11 municipalities, and hopes to launch the second phase targeting 250,000 farmers in over 200 municipalities in 2023.

Under IDF protocol, the project is led by a consortium of insurers, reinsurers and brokers, including AXA Climate, Guy Carpenter, Munich Re, Raincoat and

Swiss Re, who work closely with local Mexican officials from Agroasemex, the Ministry of Finance and the Ministry of Agriculture. The InsuResilience Solutions Fund provides 50% of project funding, with the remaining coming from a variety of public and private sources.

Smallholder farmers with five hectares or less of rain-fed land — the most climate-vulnerable population in Mexico — would be eligible for the programme. Once a triggering rainfall or drought event occurs a third party will determine the compensation to be paid to farmers with affected properties and will issue a recommendation to the insurer so that it carries out the payment. This compensation will be paid directly to the farmers through a bank transfer, or through other means, such as payment orders for those farmers without banking services.

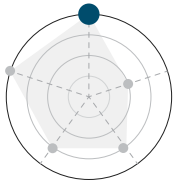
During the enrolment process farmers attend a training session that focuses on practical steps they can take to mitigate against climate-related risks. This training element is expected to be scaled up during later phases of the program.



# Insurance Capabilities Index

## Risk Finance

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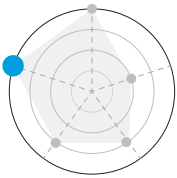


The Mexican Smallholder Farmer program will offer corn farmers with five or less rain-fed hectares insurance coverage against flood or drought, based on an agreed-upon triggering index. The program administrator is Agroasemex, a government-owned insurer that focuses on rural populations, with product design and pricing provided by Guy Carpenter, AXA Climate, Munich Re and Swiss Re.

- **Peril:** flood or drought
- **Anticipated Limits:** TBD
- **Period:** annual
- **Triggers:** index-based

## Risk Analytics

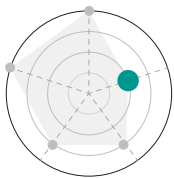
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Risk analytics for Mexican corn crops exposed to flood and drought risks will underpin the success of this program. In addition, setting an appropriate trigger and price will require extensive expertise in weather-based modelling.

## Impact Investing

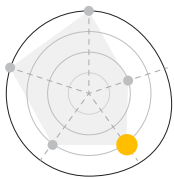
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Not currently a focus, but the model could create new investment vehicle structures.

## Strategic Philanthropy

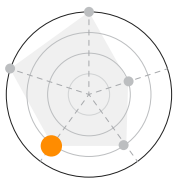
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While the InsuResilience Solutions Fund is financing 50% of the program, participating insurers, reinsurers and brokers are expected to provide services at a discounted rate.

## Stakeholder Engagement

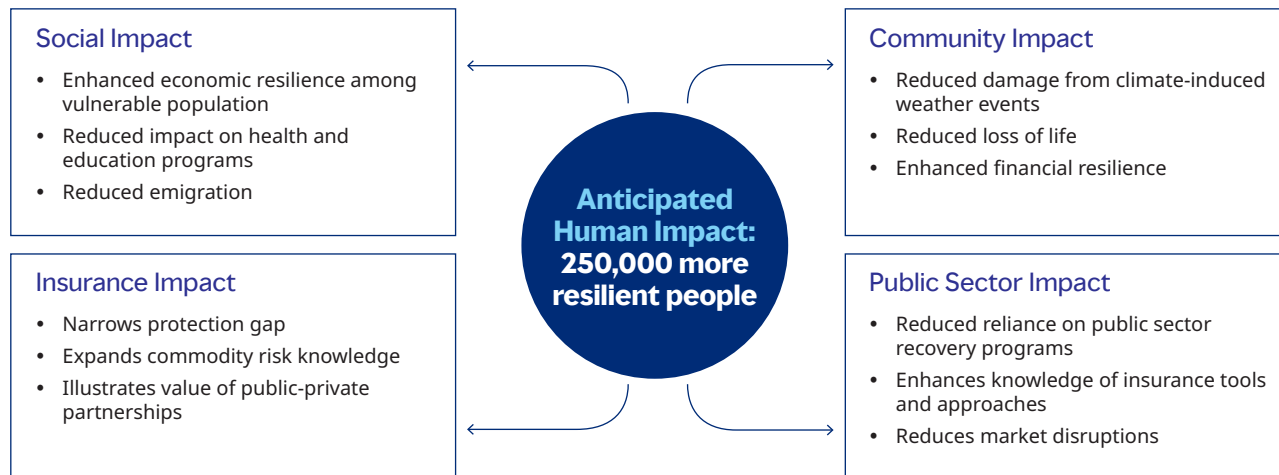
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The program is fundamentally a public policy initiative in Mexico, meaning extensive involvement and support from various local, state and national government agencies.

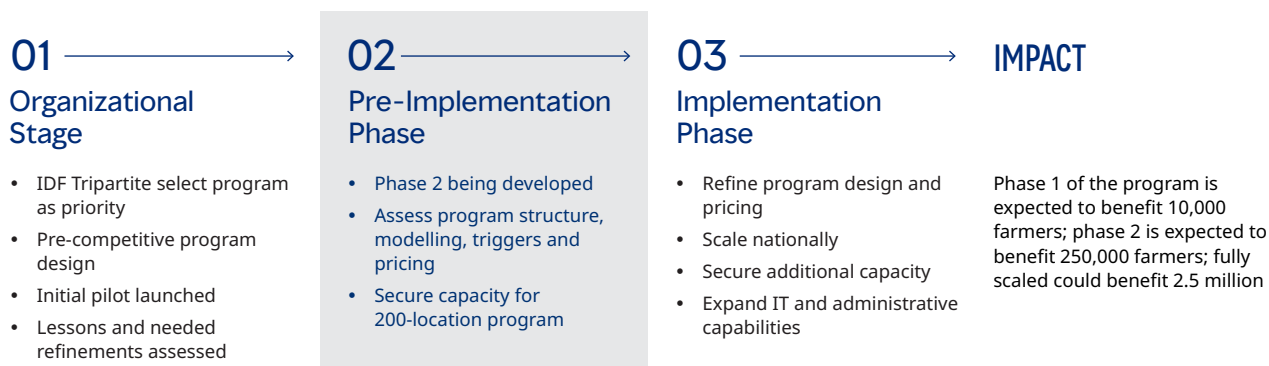
# Impact

Full implementation of the Mexican Smallholder Farmer program would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Mexican Smallholder Farmer program is concluding an initial pilot and moving into Phase 2. Opportunities exist for new industry participants in phase 2 and beyond.



# Key Contacts

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 Guy Carpenter  
 Ruth.lux@guycarp.com

**Francis Bouchard**  
 Managing Director, Climate  
 Marsh McLennan  
 francis.bouchard@mmc.com

# The Cool Capital Stack: Parametric Triggered Finance

## Overview



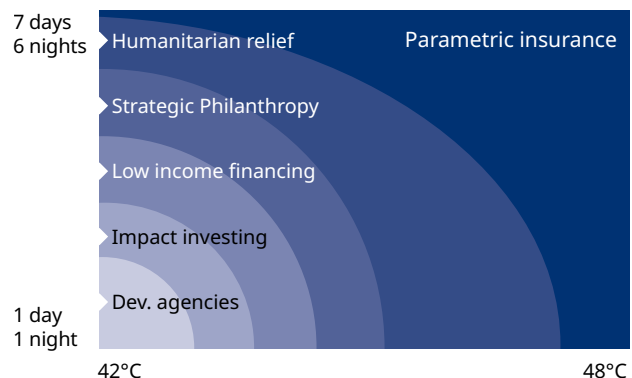
- Sponsored by Extreme Heat Resilience Alliance, supported by Marsh McLennan
- Establishes an index-based blended finance mechanism
- Complements series of heat risk reduction interventions
- Leverages all insurance capabilities
- Pilots under consideration for Santiago, Miami and Athens.



understanding of expected frequency and severity, the program can match different sources of capital — including humanitarian relief sources, development agency funding, impact investors, low-interest financing and insurance — with their respective return and impact expectations. The effort is part of a broader suite of initiatives being sponsored by the Extreme Heat Resilience Alliance, with technical assistance from Arsht-Rock and risk analysis support from Marsh McLennan.

The Extreme Heat Resilience Alliance (EHRA) seeks to create a new set of parametric instruments as part of the Cool Capital Stack. The Parametric Triggered Finance concept is an innovative and ambitious concept that aims to combine a series of extreme heat risk reduction and cooling interventions with a pre-arranged access to multiple capital sources to help manage heat-related exposures and protect people, communities, infrastructure, and local economies.

At the core of the concept is a risk index that triggers different forms of capital at different points along a common scale. The index would likely be a combination of escalating daytime and evening heat measurements coupled with staggered duration periods. By effectively plotting a common



A hypothetical illustration of the concept illustrates the advantages such a tiered model creates by channeling payments and insurability to the expected and escalated needs associated with longer duration and rising temperatures- such that early release of funds for health and humanitarian efforts

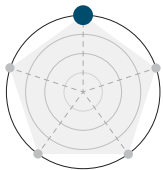
(e.g., cooling centers, electricity subsidies, healthcare worker overtime, etc.) and later funds for longer term relief, recovery and capital investments as the crisis abates.

From a risk reduction perspective, participating cities would also be expected to institute a series of heat reduction interventions such as urban forests, roof-top gardens, reflective surfaces and other proven approaches.

## Insurance Capabilities Index

### Risk Finance

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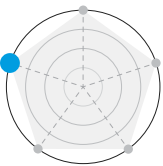
The Parametric Triggered Finance concept would require a pre-defined series of triggers across a common exposure trajectory. Multiple forms of capital and/or financing would need to be secured, with parametric insurance likely only being used for the most extreme scenarios. Public sector entities would be the likely beneficiaries of all forms of capital.

- **Peril:** extreme heat
- **Anticipated Limits:** to be set by community needs
- **Period:** annual or multi-year
- **Triggers:** index-based

Similar assessments would need to be made for each layer in the capital stack.

### Risk Analytics

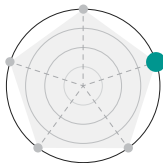
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Underpinning the Parametric Triggered Finance concept would be detailed assessments of both historical and future heat patterns, the effect of risk reduction techniques, multiple trigger modelling and ultimate parametric pricing.

### Impact Investing

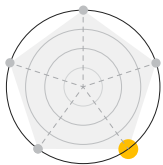
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Impact investment could represent a significant capital source for the Parametric Triggered Finance concept. In addition to funding pre-emptive action triggers on the parametric scale, investment opportunities will include projects such as green roofs, cool roofs and surfaces, urban forests, water infrastructure and technologies that assess the risks of heat to human health. Furthermore, innovative cooling technology solutions will likely deliver quantifiable benefits.

### Strategic Philanthropy

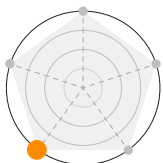
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Strategic philanthropy would also be expected to play a significant role in the Parametric Triggered Finance concept. Rather than solicit charitable funds following a heat event, though, funds would be secured before any events and pre-determined to finance particular risk reduction and relief efforts. Due to the timing and administrative efficiencies gained from the ex ante planning and funding the approach would significantly reduce heat impacts.

### Stakeholder Engagement

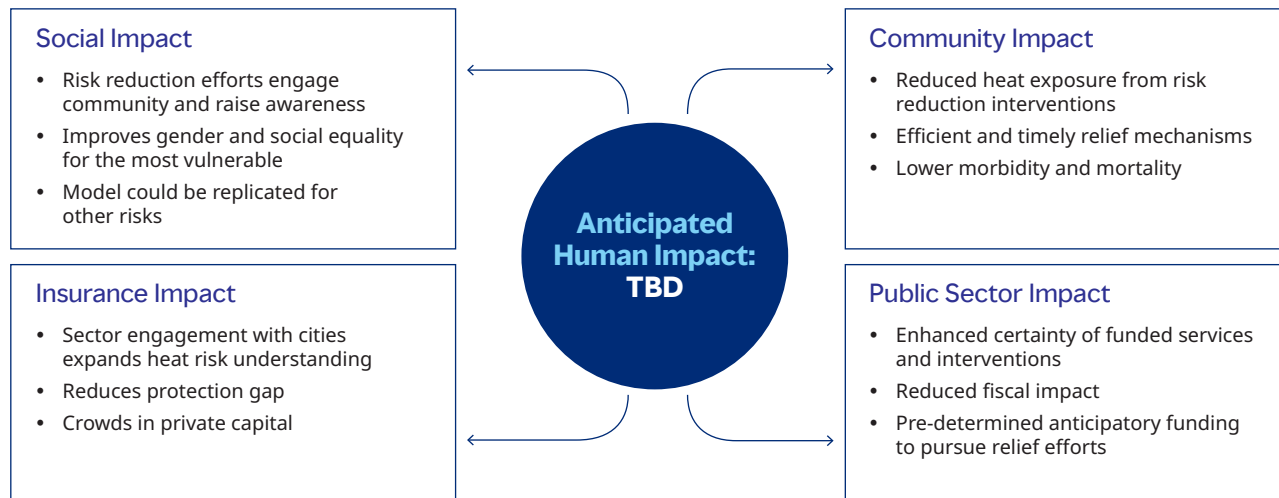
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Developing the Parametric Triggered Finance concept will require extensive engagement with participating cities, key community representatives, relief agencies, cooling technology companies, water utilities and other capital providers. In addition, local employers, business organizations, unions and other entities could play a significant implementation role. EHRA will serve as the primary convening platform.

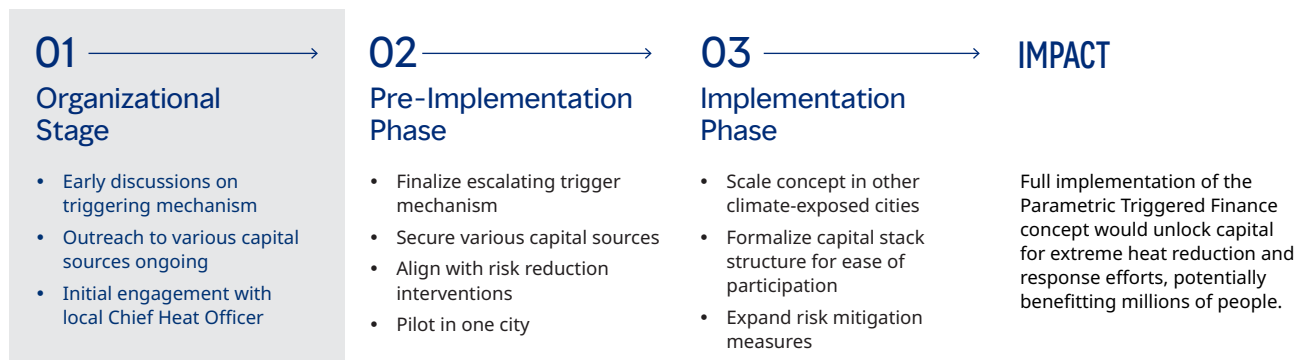
# Impact

Full implementation of the Parametric Triggered Finance concept would generate positive impacts and quantifiable benefits across a wide spectrum of stakeholders, communities, and sectors:



# Engagement

The Parametric Triggered Finance concept is still in the organizational stage with partners seeking to mobilize the blended finance model in early in 2023. Opportunities exist for new industry participants to get engaged.



# Key Contacts

To learn more about supporting the Parametric Triggered Finance concept or other elements of EHRA's Cool Capital Stack please contact:

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mmcbryde@atlanticcouncil.org

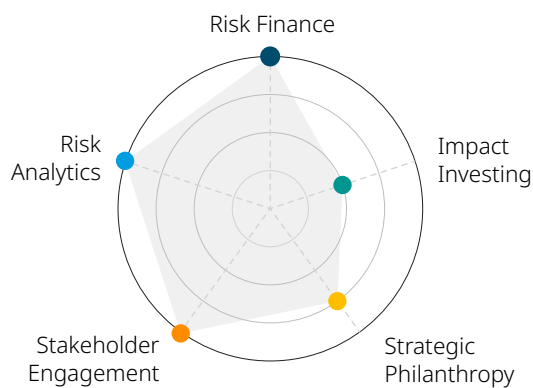
**Francis Bouchard**  
Managing Director, Climate  
Marsh McLennan  
francis.bouchard@mmc.com

# Protecting Peruvian Schools

## Overview



- Sponsored by IDF Tripartite, Funded by InsuResilience Solutions Fund
- Climate risk analytics utilized for school protection, insurance program and build-back-better claims
- Risk analytics, risk finance, stakeholder engagement, and Strategic Philanthropy are key capabilities
- Target is to benefit 4.6 million students by 2025



The initiative to ensure climate-resilient construction of Peruvian schools is one of the 20 priority projects of the Tripartite consisting of UNDP, the BMZ and the Insurance Development Forum (IDF), a public-private consortium of insurers, MFIs, UN units, development agencies and more that drives public and private institution collaboration with the aim of extending the use of insurance and risk management capabilities to people, communities, and businesses that are vulnerable principally to climate risks. With a direct mission and vision tied to

the Sustainable Development Goals and UN Agenda 2030, the IDF seeks to increase insurance penetration to create greater resilience and reduce the global protection gap.

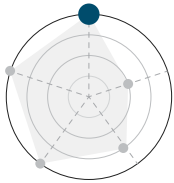
The Peruvian project seeks to leverage three sector capabilities. First, it provides extensive risk modeling and analytics to government officials in order to locate, construct and maintain public schools in the most climate-resilient means possible. Second, it complements the country's various reserve and fiscal stabilization funds by establishing an innovative risk transfer solution for interim school structures that blends traditional indemnification and parametric triggers to provide the financial resources to rebuild damaged schools in a more climate-resilient manner. And last, it leverages UNDP's local engagement capabilities to foster deep working-level collaborations with local education, finance and other government officials.

The program expects to cover 50,000 schools and benefit up to 4.6 million students by 2025.

# Insurance Capabilities Index

## Risk Finance

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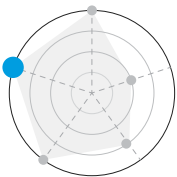


The Peruvian school project includes a sophisticated multi-peril risk transfer program that blends traditional indemnification with a minor parametric element. Extensive knowledge of innovative risk and structures and deep analytical capabilities are required.

- **Peril:** flood, rainfall, and earthquake
- **Anticipated Limits:** \$400 M
- **Period:** annual
- **Triggers:** blended parametric and indemnification

## Risk Analytics

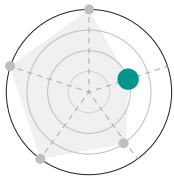
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The project relies heavily on access to multi-peril risk data to help locate, build and maintain public schools in Peru, as well as to deploy the build back better elements of claims payments. In addition, it utilizes advanced image technology and artificial intelligence tools.

## Impact Investing

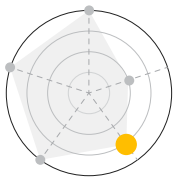
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Not currently considered.

## Strategic Philanthropy

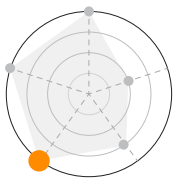
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The project is sponsored by the IDF, a voluntary public-private partnership spearheaded by insurance sector leaders. Funding is provided primarily by the German-financed InsuResilience Solutions Fund, while participating insurers are expected to provide discounted rates for products and services.

## Stakeholder Engagement

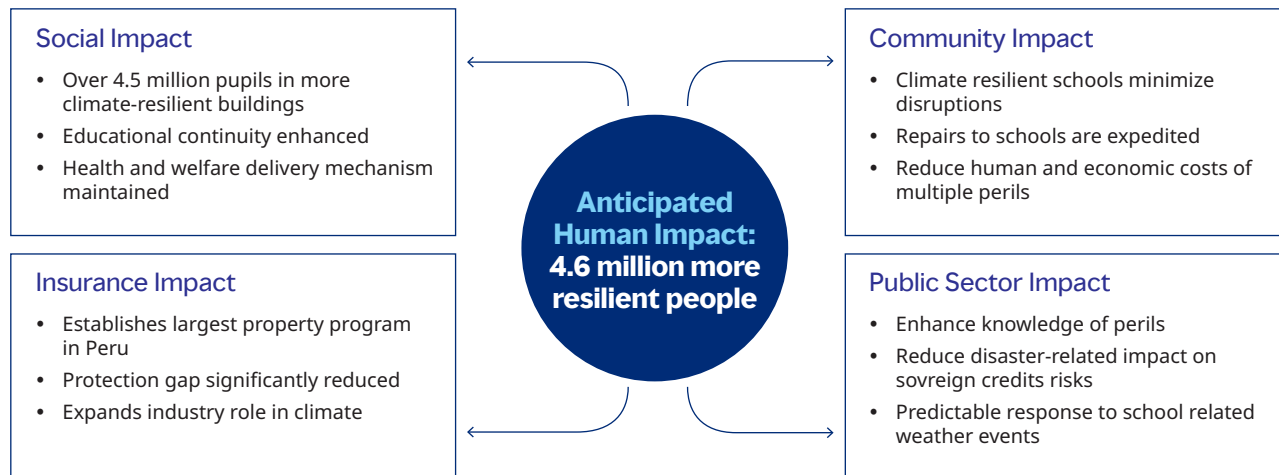
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Extensive dialogue required with the Ministry of Finance, the Ministry of Education and local officials. Leveraging its multi-stakeholder structure, the project utilizes the UN Development Program's local engagement team to facilitate and advance discussions with local officials. Lead insurers include AXA XL, Munich Re, Aspeseq (Peruvian Insurance Association), GEM & JAB and Picsure.

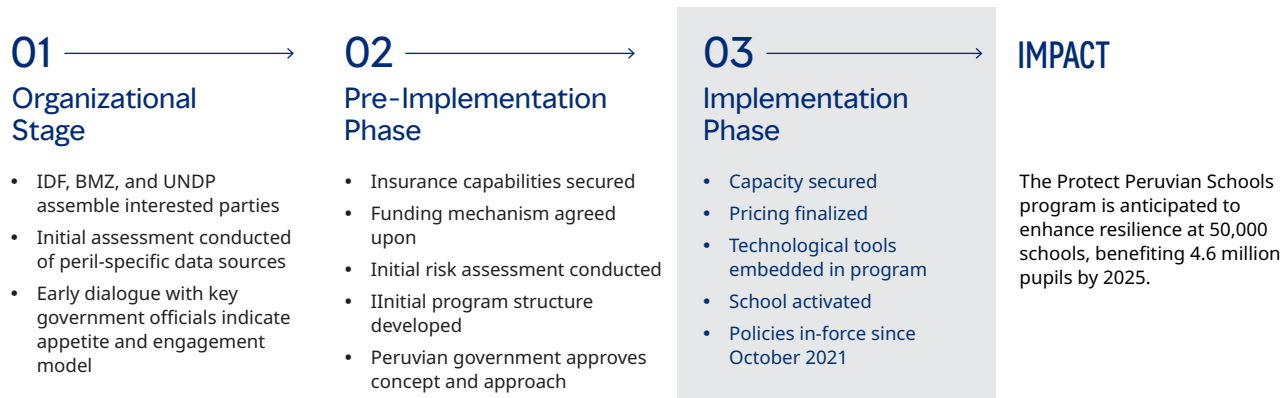
# Impact

Full implementation of the Protect Peruvian Schools project would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The IDF, BMZ, and UNDP form the sponsoring Tripartite for the Peruvian project. As such, significant dialogue and collaboration has been required to align interests, capabilities and appetite from various stakeholders. Additional capacity and engagement participants will be sought as the program matures.



# Key Contacts

To learn more about supporting the Protect Peruvian Schools project please contact:

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 Marsh McLennan  
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# Urban Infrastructure Insurance Facility

## Overview



- Sponsored by ICLEI
- Risk financing, risk analytics, and stakeholder engagement
- Priority focus on risk reduction infrastructure and insurance
- Regional risk pool plus 10 city-specific insurance facility
- Funded by KfW



The Urban Infrastructure Insurance Facility is an ambitious 10-city initiative to build the technical capacity of Latin American city officials to understand and address climate related exposures, as well as to establish and deploy a regional risk pool that will enable participating cities to access dedicated risk financing tools. The project aims to ensure local governments rapid access to the financial resources they need to build and rebuild critical infrastructure in a manner that advances climate risk reduction.

Under the program, participating communities will receive the following support:

- Facilitated application of the Economics of Climate Change Adaptation risk assessment and modeling methodology to identify cost-

effective adaptation and risk reduction strategies, including design of critical infrastructure projects;

- Tailored technical support to clarify risk financing needs and options;
- Placement support for the development of a bespoke insurance program for each city, including risk assessments, procurement services and three years of premium subsidies;
- Relationship cultivation with financial providers to ensure the long-term viability of risk financing;
- Implementation support to embed insurance into comprehensive risk management frameworks; and
- Access to a regional risk pool for higher-level risk exposures.

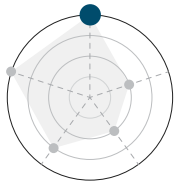
The project is financed by KfW Development Bank on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by ICLEI- Local Governments for Sustainability.

From an insurance-sector capabilities perspective the program relies heavily on risk financing and risk analytics expertise, with significant stakeholder engagement anticipated. Impact investing and strategic philanthropy are still under consideration.

# Insurance Capabilities Index

## Risk Finance

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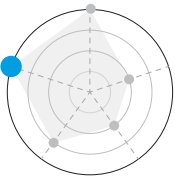


The program envisions two major forms of risk transfer capabilities. The first is the regional risk pool that will be established for participating cities to access high-level catastrophic cover, while the second is a series of city-specific insurance programs.

- **Peril:** flood, sea-level rise, flood, drought and landslides for public infrastructure
- **Anticipated Limits:**
  - Pool: depends on city needs, possibly \$50 M to \$100 M
  - City: depends on local needs, possibly \$1 M to \$20 M
- **Period:** could be annual or multi-year durations
- **Triggers:** to be determined

## Risk Analytics

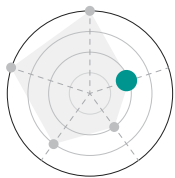
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The UIIF relies heavily on risk assessment and management expertise. Deep understanding of risk data sources for Latin American cities will be critical, as will be a proven ability to convey risk exposure and mitigation concepts to a public sector audience. The risk assessment will need to include multiple perils over multiple climatic and mitigation scenarios. Moreover, the regional risk pool will require complex analytical capabilities to optimize value for city participants and secure access to private market capital and innovative risk tools.

## Impact Investing

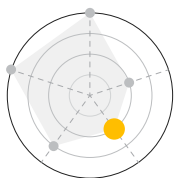
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The UIIF does not currently envision leveraging insurers' impact investing capabilities, though it may expose global insurers to investment opportunities as the program's risk reduction and financing objectives effectively de-risk large-scale infrastructure projects.

## Strategic Philanthropy

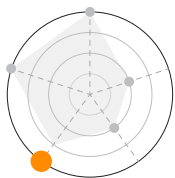
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The UIIF is fully funded by one of the development communities leading proponents of insurance solutions, financed by KfW Development Bank on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). As such, it is not relying on philanthropic support, though participating insurers may want to consider providing their services at a discounted rate.

## Stakeholder Engagement

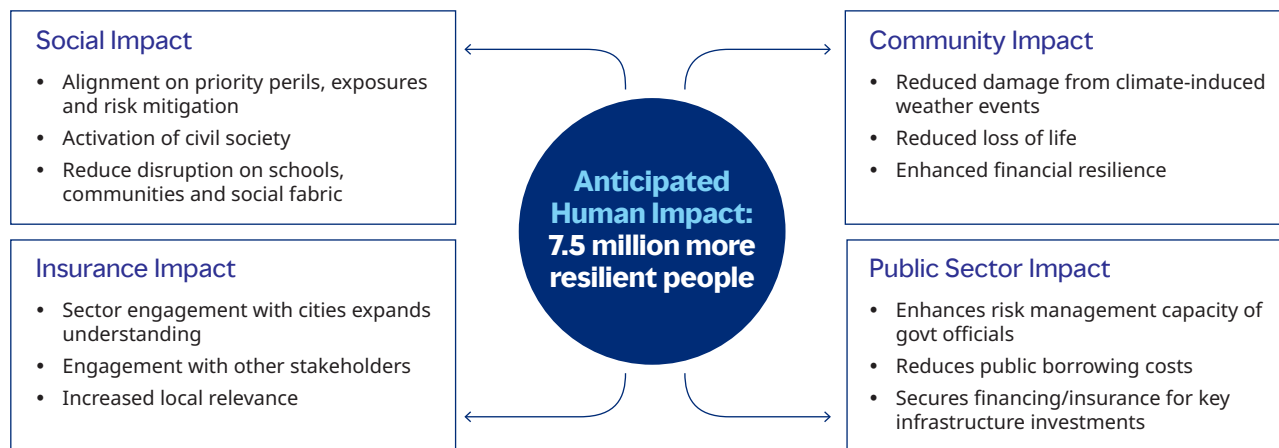
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The UIIF envisions extensive stakeholder engagement, as participating insurers and brokers will interact directly with officials across various city departments, key members of civil society, regional development agencies and other stakeholders.

## Impact

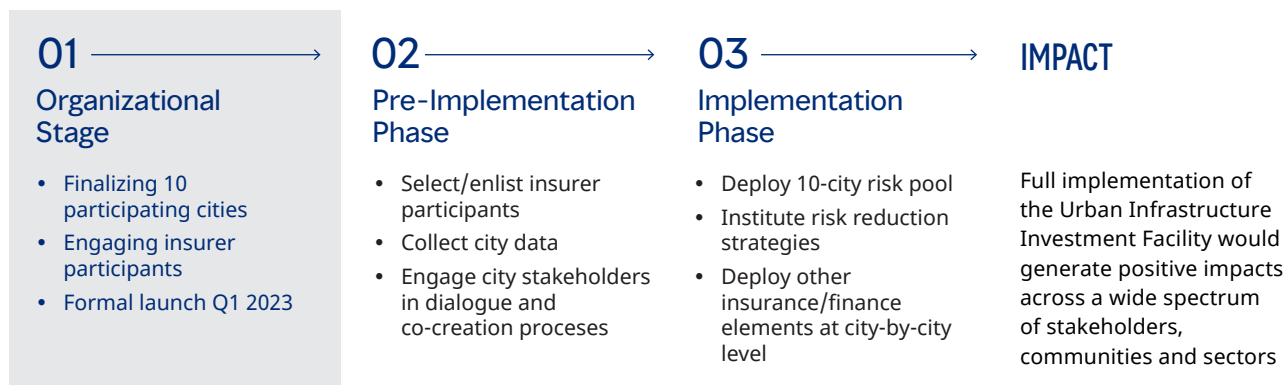
Full implementation of the Urban Infrastructure Investment Facility would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



## Engagement

ICLEI is currently in the organizational stage of the program. It's strategy, objectives and governance mechanisms (including funding) have been finalized, and it is now planning to formally name the cities and launch the initial consultations in the first quarter of 2023.

No formal insurance partners have been secured. Interested insurance sector participants must have working relationships with local Latin American markets, and be keen on increasing risk awareness and supporting closing the gap in insurance knowledge and training for government officials.



## Key Contacts

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### Francis Bouchard

Managing Director, Climate  
Marsh McLennan  
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# Women Entrepreneurs' Extreme Heat Program

## Overview



- Sponsored by Extreme Heat Resilience Alliance and SEWA
- Blue Marble leading program design
- Provides wage replacement coverage for extreme heat episodes
- Risk finance and risk analytics
- Coverage is coupled with education on extreme heat mitigation measures



The Women Entrepreneurs' Extreme Heat Program is aimed at protecting the livelihoods of heat-exposed women business owners in India. The program's sponsor is the Self Employed Women's Association (SEWA), India's single largest Central Trade union, representing over 2.1 million female entrepreneurs across 18 Indian states. SEWA's four pillars are organizing collective action, building capacity, advancing access to healthcare and facilitating capital formation.

The program is currently assessing the mechanics of a pilot that would combine early-warning mechanisms, resilience training gamification and new heat-

resilient technologies with an index-based insurance mechanism that would provide insurance payouts in cases of pre-defined extreme heat events. Such an approach would better inform members of dangerous heat conditions while ensuring that their livelihoods and wellbeing are less severely impacted despite not being able to work due to extreme heat conditions.

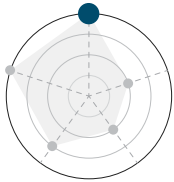
Underpinning the program will be transparent and trustworthy triggers that incrementally increase pay-outs as heat conditions worsen. In addition, complex modelling will be required to properly price and structure the program, as well as a comprehensive technology solution that embeds seamlessly into SEWA's architecture to facilitate program administration. The Extreme Heat Resilience Alliance is spear-heading the dialogue, with Marsh McLennan and Blue Marble Microinsurance as early discussion partners to design and underwrite the insurance solutions.

The aim is to launch a pilot program in Q2 2023 focusing on particular professions in two or three locations, and then to systematically scale the program across the SEWA membership.

# Insurance Capabilities Index

## Risk Finance

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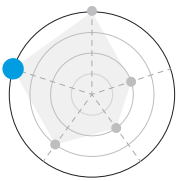


The Women Entrepreneur’s Extreme Heat Program utilizes an index-based trigger to provide escalating coverage for members’ credit payments missed due to extreme heat working conditions. The initial pilot may cover up to 10,000-20,000 business owners, with scaled deployment covering as many as 1 million exposed workers. Blue Marble is expected to secure access to local capacity through its consortium owners.

- **Peril:** extreme heat
- **Anticipated Limits:** TBC
- **Period:** annual
- **Triggers:** index-based

## Risk Analytics

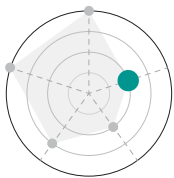
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Critical to this program will be credible and transparent heat measurements, complex extreme heat risk modelling for multiple locations, and full integration of risk mitigation strategies. Blue Marble has the expertise, capacity, and technology to efficiently design the indices required to successfully implement this cover.

## Impact Investing

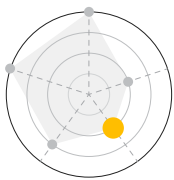
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Not currently a focus, but the model could create new investment vehicle structures.

## Strategic Philanthropy

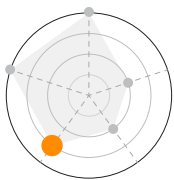
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Not contemplated at this time.

## Stakeholder Engagement

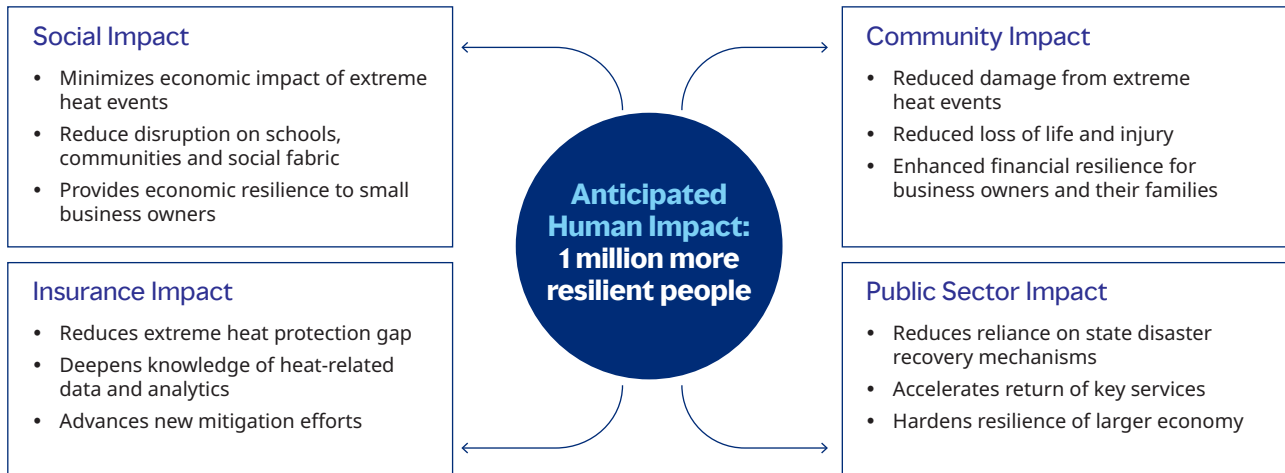
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The program envisions extensive engagement with heat-exposed SEWA members from many different professions.

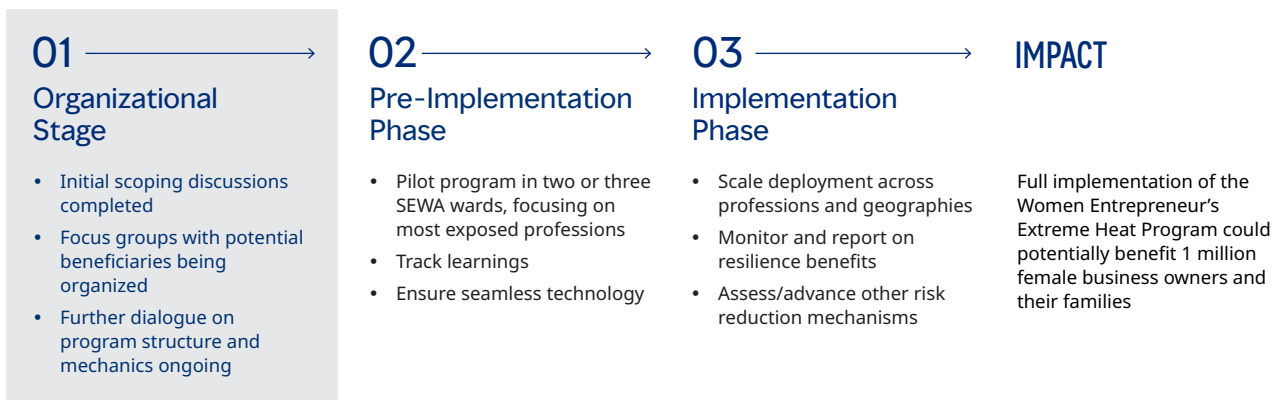
# Impact

Full implementation of the Women Entrepreneurs’ Extreme Heat Program would generate positive impacts across a wide spectrum of stakeholders, communities, and sectors:



# Engagement

The program is still in the organizational stage with hopes of launching a pilot in the summer of 2023. Opportunities exist for new industry participants to get engaged.



# Key Contacts

To learn more about supporting the Women Entrepreneur’s Extreme Heat Program please contact:

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# CCRI Systemic Resilience Forum

## Overview



- CCRI working group of public, private and civil society actors
- Tools and methodologies to enhance sovereign-level integration of physical climate risks in national infrastructure prioritization practices
- Risk finance, risk analytics, impact investing and stakeholder engagement
- Currently being piloted in Jamaica, advanced discussion in four additional countries



The Coalition for Climate Resilient Investment (CCRI) has developed a methodology to support national governments in their assessment and management of climate risks. Advancing that methodology is a consortium of Systemic Resilience Forum (SRF) members, including governments, technical contributors, multi-lateral finance agencies, private finance, think tanks, development agencies and credit agencies. Together, the aim of the SRF methodology is to establish a proxy for sovereign credit quality as it relates to physical climate risk exposures. The methodology has two main elements, both focused on delivering practical tools and approaches.

The first is a National Investment Prioritisation Tool (NIPT), aimed at identifying the interventions and

investments in which every unit of fiscal capacity is to optimise the protection of socio-economic and ecosystem value, and the second are Systemic Resilience Metrics (SRM) aimed at providing sovereign decision-makers with the element of recognition and reward associated to their support and implementation of the output resulting from the NIPT.

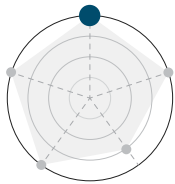
The complexity of both elements poses challenges, including capturing the full extent of sectoral, social and natural eco-system exposures, identifying and quantifying chronic risks, balancing new infrastructure investments with retrofitting of existing assets, and accurately portraying risk exposures over longer-term time horizons. However, overcoming these challenges would help define long-term infrastructure planning, improve understanding of valuation trends, protect social continuity and reframe the role of nature-based solutions.

The SRF is piloting the methodology in Jamaica in partnership with the Planning Institute of Jamaica, the UK Government and the Green Climate Fund. The first phase of the CCRI Jamaica Pilot was successful thanks to the world-leading expertise and analytics from the University of Oxford's Environmental Change Institute, resulting in the launch of Jamaica's Systemic Resilience Assessment Tool (J-SRAT).

# Insurance Capabilities Index

## Risk Finance

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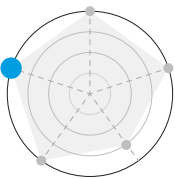


The CCRI's SRF is deeply steeped in understanding and exploring a more efficient balance between investment, national planning and risk finance options, including insurance. The metrics and prioritization process should lead to the selection and pursuit of innovative risk finance approaches that complement and reward long-term investment decision-making.

By improving national decision-making and establishing a robust methodology for infrastructure investment prioritization, the SRF should accelerate the project pipeline and foster more impact investment opportunities.

## Risk Analytics

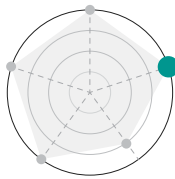
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CCRI's SRF is fundamentally an intense application of risk analytics with a focused output of prioritizing infrastructure investments. It requires a deep understanding of local risk, economic and social data, as well as significant expertise in economic forecasting, climate modeling, infrastructure finance, asset classes, regions and sectors.

## Impact Investing

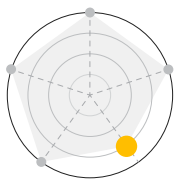
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Impact investing, understood as an investment typology for which sub-optimal risk-return profiles are accepted for the sake of delivered impact, is core to CCRI only during its proof-of-concept phase. After such phase, CCRI's ambition is to systematize related practices across geographies, asset classes and sectors.

## Strategic Philanthropy

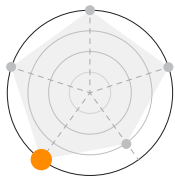
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The CCRI is industry-funded and much of the analytical work is provided for no or little cost. Other donors and partners help support individual projects.

## Stakeholder Engagement

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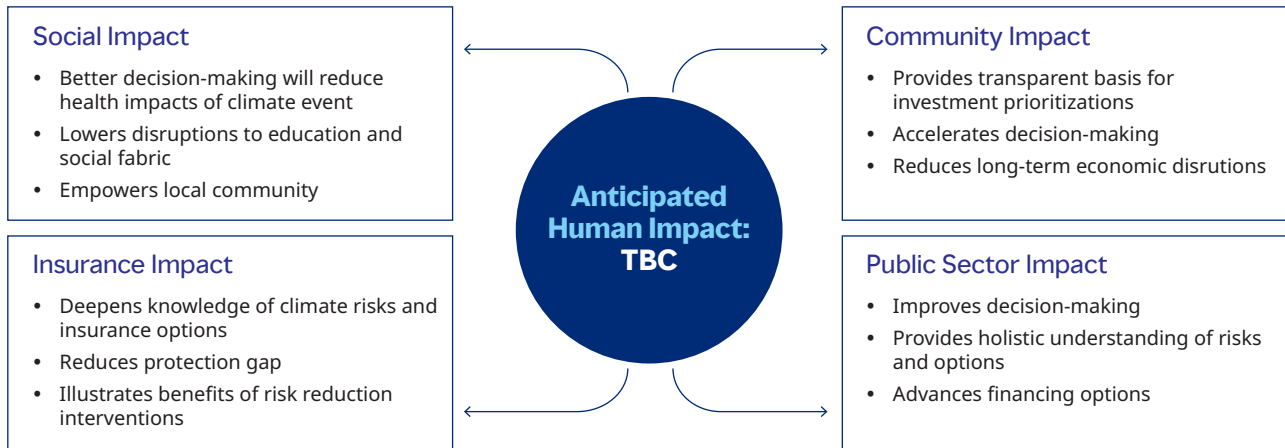


The CCRI's SRF is essentially a stakeholder engagement initiative in that it provides national decision-makers a set of tools to deploy in their local settings. As such, it requires extensive interaction, dialogue and collaboration with government and other officials.



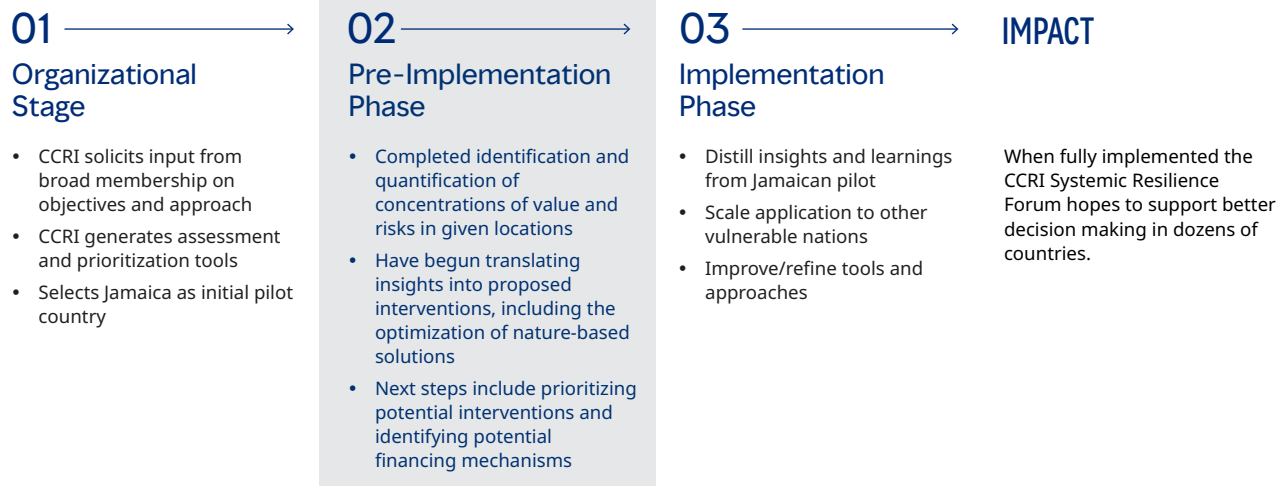
# Impact

Full implementation of the CCRI Systemic Resilience Forum’s approach would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The CCRI System Resilience Forum is still in the early stages of its engagement with national governments, suggesting that additional collaboration partners would be welcome.



# Key Contacts

To learn more about partnering with the CCRI and its various initiatives please contact the following:

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 CCRI  
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# The Coastal Risk Index

## Overview



- AXA XL, Canada, UK and the Ocean Risk and Resilience Action Alliance
- Innovative tool to assessing coastal flood risk and impact to communities and assets
- Risk Analytics, Stakeholder Engagement and Strategic Philanthropy
- Calculate risk reduction benefits of coral reefs and mangroves



The Coastal Risk Index (CRI) is an innovative tool designed to calculate coastal flood hazards under different climate change scenarios and quantify the potential risk reduction benefits of coral reefs and mangroves for coastal communities around the world. The tool provides compelling visualization of flood risk levels today, in 2030 and 2050, including anticipated impact on populations and assets. The CRI also assesses the impact of flood risk on social and economic vulnerability and how nature-based solutions can be leveraged to build resilience in the most vulnerable communities.

The tool has been designed to benefit multiple stakeholders. Insurers can use it to price risk more

accurately, and in so doing, potentially design new risk products, including parametric solutions focusing on ecosystem restoration. Public and private investors can use the tool to generate long-term investment insights. And governments can utilize CRI scenarios as the basis for land use planning, risk assessment and reduction, alongside providing the data for long-term coastal management that integrates nature-based solutions.

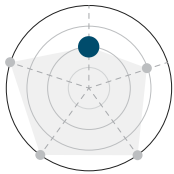
The CRI provides a global view with more coastal communities expected to utilize the tool over the coming months and years. ORRAA is also working on other coastal community risk initiatives.

The CRI is supported by AXA's Ocean Risk Initiative, an industry leading effort to drive product innovation, respond to ocean risks and increase ocean literacy. Key academic partners include Dr. Roshanka Ranasinghe of IHE Delft and Professor Michael Beck of the University of California Santa Cruz. Funding is provided by AXA XL, and the Government of Canada and Government of the UK through the Ocean Risk and Resilience Action Alliance.

# Insurance Capabilities Index

## Risk Finance

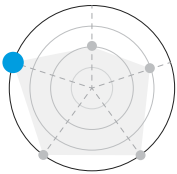
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The CRI provides a critical tool from which risk transfer products can be developed.

## Risk Analytics

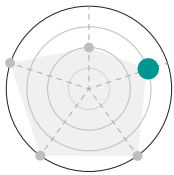
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The CRI is fundamentally a risk analytics tool, blending physical risk exposure, climate modelling, nature-based resilience measures and other factors to compile clear and compelling visualizations of current and future flood risk. To develop the modelling and data required for the CRI, there has been close collaboration between academia and the risk industry.

## Impact Investing

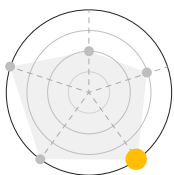
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In addition to insurers, the CRI is expected to inform institutional and public sector investors on risk exposures.

## Strategic Philanthropy

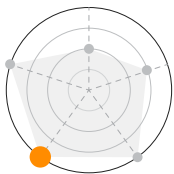
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The AXA Ocean Risk Initiative is a strong example of long-term focus and impact being achieved through corporate strategic philanthropy. AXA also invests heavily in cutting-edge academic research as well as the practical application of insights through product innovation and high-impact initiatives.

## Stakeholder Engagement

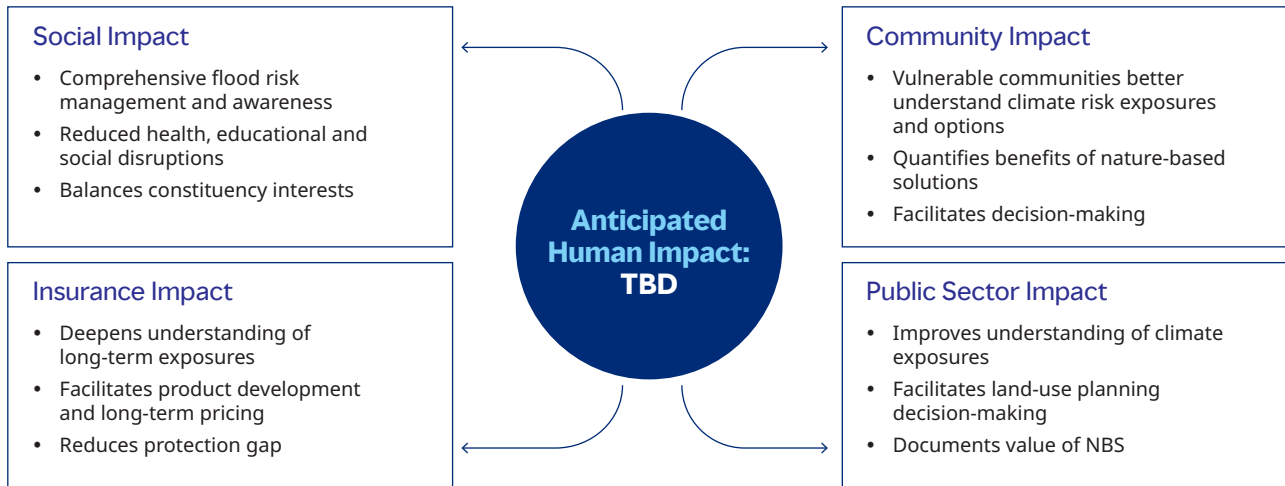
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Due to the expansive nature of data required to enable the CRI it demands extensive engagement with local government, civil society and academic representatives.

# Impact

Full implementation of the Coastal Risk Index would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Coastal Risk Index is currently in the early implementation stage. Insurers interested in applying for the CRI should contact the sponsors below.

## 01 —————> Organizational Stage

- AXA XL and ORRAA define program
- Academic partners identified and engaged
- Initial modelling work conducted and tested
- Outreach to potential pilot communities

## 02 —————> Pre-Implementation Phase

- Global flood hazard dataset published
- Social vulnerability and blue economy impacts calculated
- Web platform to be refined

## 03 —————> Implementation Phase

- Specific case studies identified
- Share modelling capabilities with local stakeholders, investors, and risk managers
- Refine tool

## IMPACT

The Coastal Risk Index seeks to provide critical ecosystem data for decision makers to enhance the resilience of communities from ocean related risk.

# Key Contacts

To learn more about supporting the Coastal Risk Index please contact:

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### Francis Bouchard

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# Community Disaster Resilience Zones

## Overview



- Sponsored by Reinsurance Association of America
- US federal policy initiative to concentrate DRR funding in the most exposed communities
- Utilizes tax policy to incentivize private sector investment in climate risk mitigation projects
- Risk Analytics, Stakeholder Engagement and Impact Investing



The Community Disaster Resilience Zone (CDRZ) concept is a public policy initiative led by the US reinsurance sector. Its primary aims are to (a) identify the most vulnerable communities, (b) steer federal resources to those communities, and (c) deploy new tax incentives to attract investment in climate risk reduction projects in those communities. As of October 2022, the legislation had passed the US Senate, and was pending House approval. Final enactment is anticipated in 2022.

CDRZ is based on other US programs that utilize zone designation to create dedicated tax and other incentives for particular activities to occur within that zone. In CDRZ's case, the zones would be identified by applying the FEMA Risk Index to assess

various climate, social and economic vulnerabilities. Communities identified as the most at-risk and in-need would then receive dedicated federal funding, training and other support to advance accelerated deployment of risk reduction measures. Under the legislation, FEMA would designate the top 50 census tracts by hazard and 1% of the most vulnerable census tracts in a state.

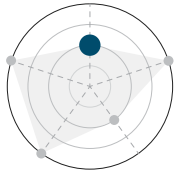
To supplement the federal benefits additional legislation is being developed that would seek to monetize the expected future savings achieved by disaster risk reduction projects by authorizing tax-advantaged bond instruments reflecting a portion of those anticipated benefits. Considering that the standard benefit-cost ratio for such projects is 6:1, these resilience credit-type instruments could become a major funding source for local projects. And as major purchasers of US municipal bonds, (re)insurers would be expected to invest heavily in such instruments, leveraging the industry's massive investment portfolios.

The initiative is a strong example of industry stakeholder engagement creating new opportunities for industry impact. In addition, the long list of non-industry supporters illustrates the multi-stakeholder interest in partnering with the sector to advance common causes around climate adaptation.

# Insurance Capabilities Index

## Risk Finance

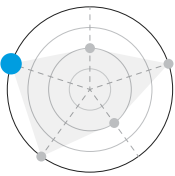
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The project does not focus on financing risk transfer. However, if fully implemented, the CRDZ should facilitate significant investments in community-level disaster risk reduction efforts, which in turn should create market conditions conducive to sustainable insurance markets.

## Risk Analytics

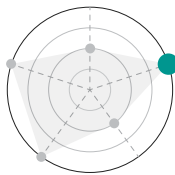
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CDRZ relies heavily on risk analytics, but primarily those of FEMA and other US government agencies.

## Impact Investing

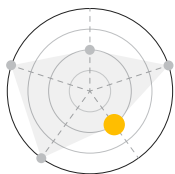
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One of the primary purposes of the CDRZ is to incentive private sector investment in community-level risk reduction efforts. If fully deployed, the proposal would create new tax-advantaged instruments that reflect a portion of the avoided losses that the project would be anticipated to generate. This innovative approach could transform disaster risk reduction funding in America.

## Strategic Philanthropy

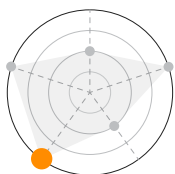
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The project does not necessarily involve strategic philanthropy. However, if fully deployed, CDRZ would catalyze significant multi-stakeholder dialogue at the community level, which could identify opportunities for philanthropic impact.

## Stakeholder Engagement

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The Reinsurance Association of America's leadership on this initiative is a classic example of stakeholder engagement. They not only led the extensive dialogues with legislative policy leaders, they also enlisted support from many non-industry groups who share the objective to equip local communities with innovative DRR tools.

Additional support will be required to achieve final enactment of the initial framing legislation and the ensuing tax provisions.

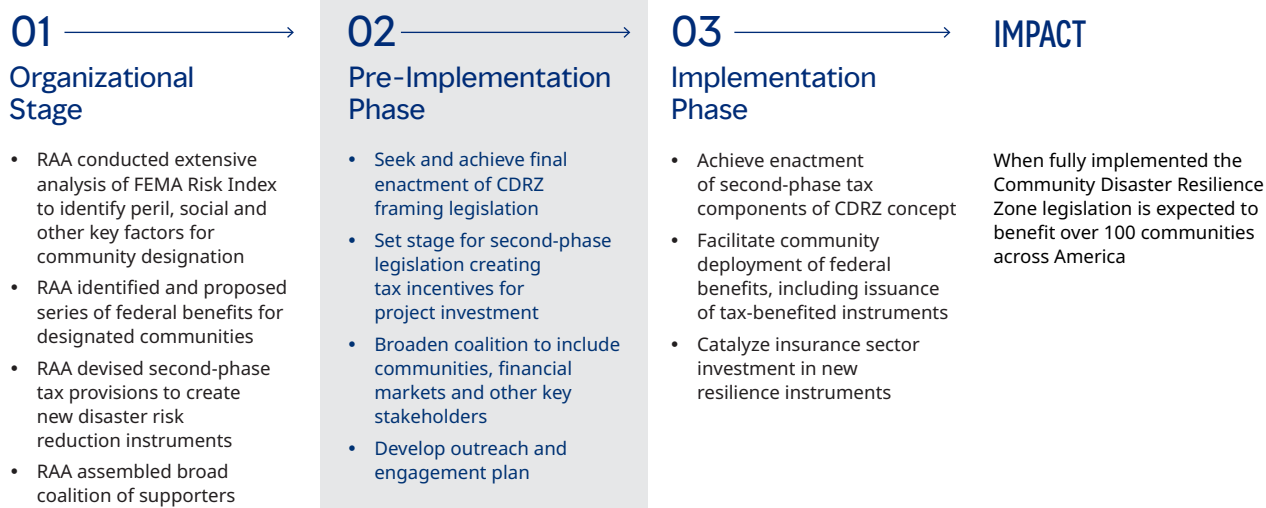
# Impact

Full implementation of the Community Disaster Resilience Zones Act would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Reinsurance Association of America is spear-heading this effort but has sought input, collaboration and support from industry and non-industry actors throughout the process. Significant more support and engagement will be necessary to achieve full enactment and ultimate deployment of the CDRZ concept.



# Key Contacts

To learn more about supporting the Community Disaster Resilience Zone effort please contact:

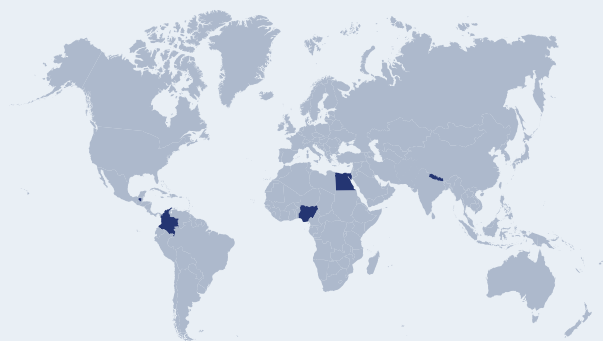
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# Global Actuarial Initiative (GAIN)

## Overview



- Sponsored by UNDP and Milliman; funded by Milliman
- Focus is to develop actuarial expertise to support emerging market risk sectors
- Risk analytics, stakeholder engagement, and strategic philanthropy
- Starting with four pilot countries, expanding to 20 by 2025



Milliman will help enable insurers, pension funds, and social security administrations to better understand and manage risks, thereby facilitating the offering of innovative and affordable insurance solutions. This initiative will provide local governments with enhanced risk analytics capacity, thereby improving risk awareness, risk reduction options, and decision-making.

Along with Milliman's expertise and talent, UNDP, through its Insurance and Risk Finance Facility, will support a better functioning of insurance markets and help to price risk-responsive and inclusive insurance.

Starting with a group of countries in 2022 (Colombia, Egypt, Nigeria, and Nepal) the UNDP-Milliman Global Actuarial Initiative (GAIN) will build improved capacity in actuarial skills and risk modelling through UNDP Country Offices to roll out the programme at the country level. The actuarial situation in each country will be assessed and a roadmap will be developed with local stakeholders, including regulators, central banks, universities, insurers, actuarial organizations, and industry associations to address identified gaps and opportunities. Based on the roadmap, interventions will be coordinated at the country level.

As part of the in-market engagement, the project will also issue various papers assessing the country's climate risk situation, including recommended options.

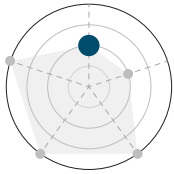
Milliman is seeking other industry representatives to join them with funding and/or in-kind expertise.



# Insurance Capabilities Index

## Risk Finance

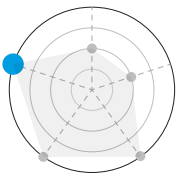
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The Milliman/UNDP GAIN project does not directly involve risk finance, though the actuarial sciences are the fundamental building blocks for accurate pricing and policy structure. In addition, many developing countries lack credible peril-specific data, further reinforcing the significance of actuarial upskilling.

## Risk Analytics

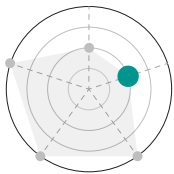
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Significant expertise in risk data, assessment, modelling, and visualization are required to engage.

## Impact Investing

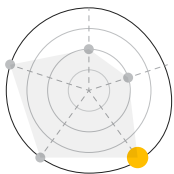
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Not currently considered.

## Strategic Philanthropy

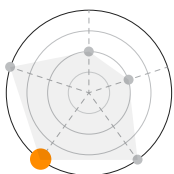
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Milliman has committed \$2 million annually in financing and in-kind support to advance the program. Currently, the firm has three-person teams in place in four countries.

## Stakeholder Engagement

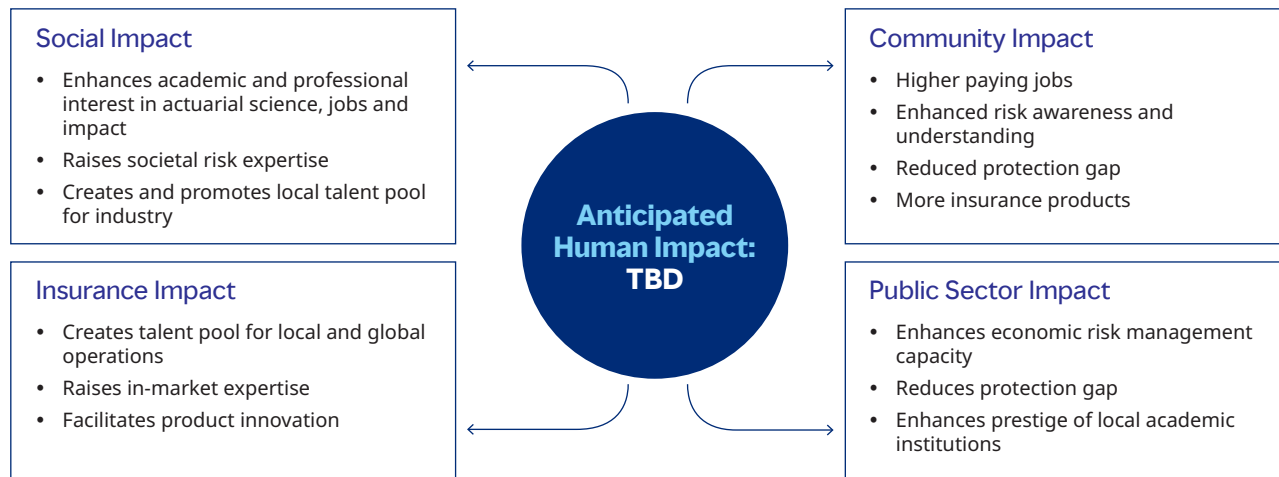
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Extensive engagement required of the local insurance sector, pension providers, institutional investors, academic institutions, governments, associations and other stakeholders.

# Impact

Full implementation of the Milliman/UNDP GAIN project would generate positive impacts across a wide spectrum of stakeholders, communities, and sectors:



# Engagement

Milliman and the UNDP have formally launched the program and initiated a pilot program in Egypt. Additional expertise and engagement participants will be sought as the program matures.



# Key Contacts

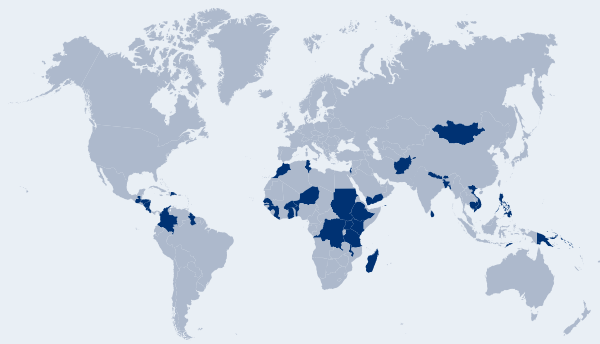
To learn more about supporting the Milliman/UNDP Global Actuarial Initiative please contact:

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 Managing Director, Climate  
 Marsh McLennan  
 francis.bouchard@mmc.com

# Global Risk Modelling Alliance

## Overview



- Founded by IDF and V20 Group of Ministers of Finance; funded by German government
- Knowledge and engagement program making climate and disaster risk modelling available to vulnerable countries
- Risk analytics capability development
- GRMA is a key enabler to pursuing climate risk reduction projects



The [Global Risk Modelling Alliance](#) is a coalition of insurance industry risk modelers seeking to improve accessibility to climate risk data and analytics for the most climate-vulnerable nations. It was formally launched by the Insurance Development Forum and V20 Finance Ministers in June of 2022, and is already directly in six countries building risk analytics capacity by working collaboratively on co-defined sub/sovereign risk programs. The ultimate aim of GRMA is to promote the efficient and equitable flow of investment in resilience measures and risk transfer, to help protect populations and grow markets.

Under the program, participating countries will receive the following support:

- Open-source technology and data standards, provided by industry and optimized for public-sector use;
- Grant financing to help countries fill model and data gaps; and
- A technical assistance team of public and private sector practitioners to work with countries on applied projects.

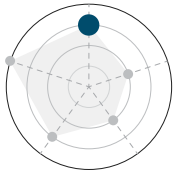
Following the initial IDF/V20 announcement to pursue such a platform at COP26, Germany's BMZ confirmed €11 million in funding to accelerate the launch of engagement programs in select V20 countries. Possible discussion partners for the program include Global Shield Pathfinder countries (Bangladesh, Ghana, Senegal, Costa Rica, Philippines and Fiji) as well as Colombia, The Gambia, Ghana, Guatemala, Indonesia, Madagascar, Nepal, The Philippines, Rwanda, Tanzania, Uganda, Viet Nam and some small island states including Comoros, Kiribati, The Maldives and the Republic of the Marshall Islands.

From an insurance-sector capabilities perspective the program relies heavily on risk analytics and risk management expertise.

# Insurance Capabilities Index

## Risk Finance

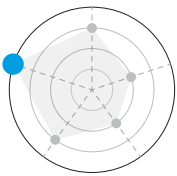
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While GRMA is focused on the early stages of risk identification and assessment, its analysis will underpin the ability of participating nations to develop sustainable risk transfer and finance programs.

## Risk Analytics

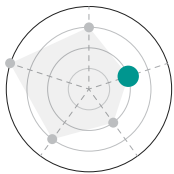
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Improved risk analysis and understanding in V20 countries opens the door to resilient investment and can reduce the burden on governments by transferring risks to capital and insurance markets that have the capacity and expertise to better bear them. It also enhances risk management, disaster preparedness and crisis response programs which prioritize early action and protect vulnerable populations.

## Impact Investing

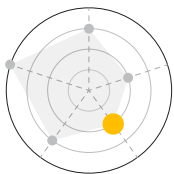
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Not currently a focus, but the national dialogues could create new investment vehicle structures.

## Strategic Philanthropy

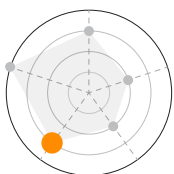
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BMZ committed €11 million for the first 4-6 countries and may add further funding to support the GRMA's role in the Global Shield. BMZ encourages further donors and philanthropies to join them in supporting the GRMA.

## Stakeholder Engagement

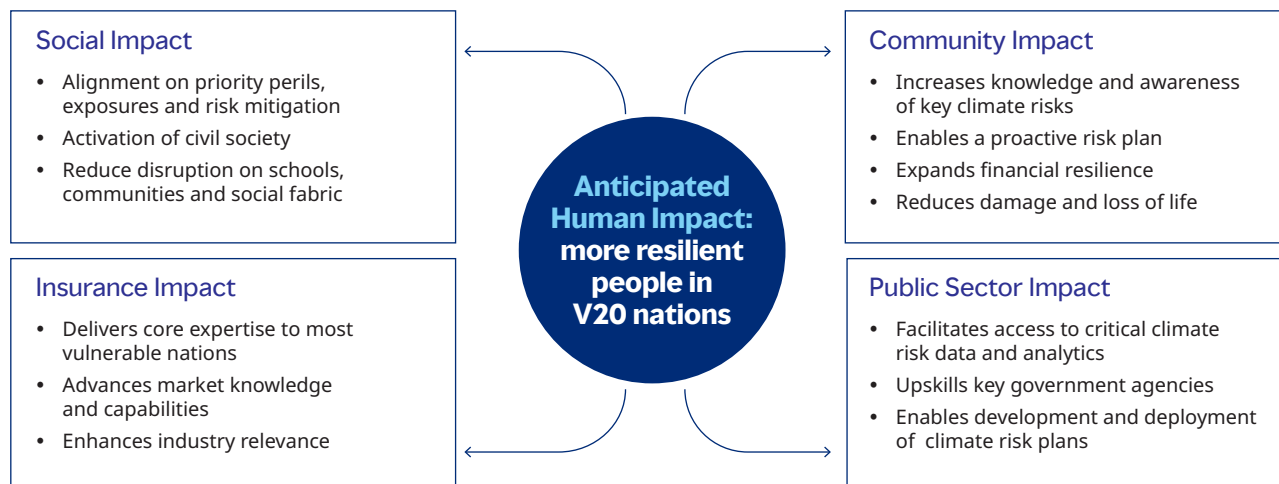
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The program is fundamentally a direct government engagement platform, leveraging Finance Ministry influence and convening capabilities.

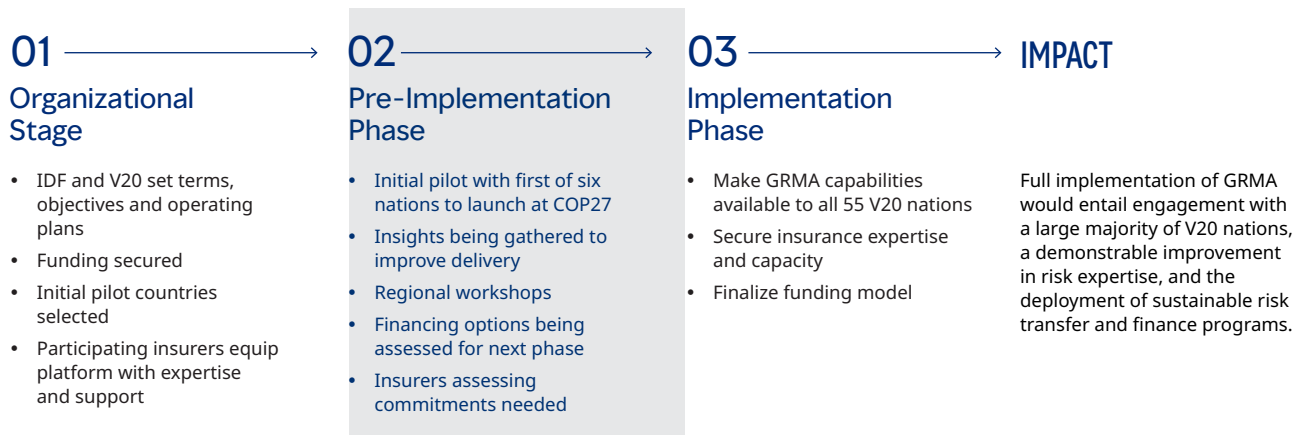
# Impact

Full implementation of the Global Risk Modelling Alliance would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

GRMA is the output of IDF-convened engagement between the insurance sector and government representatives of the most climate-vulnerable nations on earth. Extensive dialogue continues. Insurers and reinsurers interested in contributing expertise are encouraged to contact the GRMA team.



# Key Contacts

To learn more about supporting the GRMA please contact:

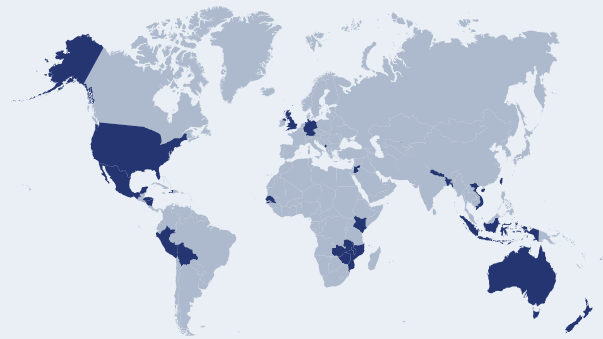
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# Zurich Flood Resilience Alliance

## Overview



- Sponsored Zurich Insurance Group; funded by Z Zurich Foundation
- Multi-stakeholder alliance focusing on reducing impacts of flood
- Risk analytics, strategic philanthropy and stakeholder engagement
- Focused exclusively on climate risk management
- Target is to benefit 2 million people by 2024



The Zurich Flood Resilience Alliance (the Alliance) is a decade-old initiative that seeks to raise low-income vulnerable communities' awareness and understanding of their resilience to flood risk through an open-source resilience measurement framework and accompanying resilience-building interventions. The Alliance model brings together partners from across the development, humanitarian, private and academic sectors that collectively pursue common objectives through local and global efforts (their Theory of Change can be viewed here: <https://www.youtube.com/watch?v=JVS5IMW7w5Q>). Partners include the International Federation of Red Cross/Red Crescent Societies, Practical Action, Mercy Corps, Concern Worldwide, Plan International, ISET International, IIASA and LSE. Both Zurich Insurance and the

Z Zurich Foundation are also members of the Alliance. The methodology is built around community-based dialogue that helps inform analysis and intervention selection. That methodology, in turn, is supported by the creation of the Flood Resilience Measurement for Communities tool (FRMC), which allows communities to take a holistic view of their situation, including not only the physical elements of risk but also the social, economic and human dimensions too.

In the program's first phase, the Alliance engaged more than 100 low-income communities in nine countries, affecting over 250,000 people. In the second phase, launched in 2018, this has been extended to more than 20 countries and over 300 communities. There is also a deliberate focus on how to use the evidence to advocate for scaled impact. For example, in Peru the local community partner used the tools to help develop low-cost community-led Early Warning Systems. This was picked up by the local weather service who are funding an expansion across whole river basins in the country, potentially impacting hundreds of thousands of people.

In 2022, the Z Zurich Foundation established additional pilot programs, building on the Alliance work, that seek to apply the framework to increasingly complex environments, including multi-peril exposed communities and large urban cities.

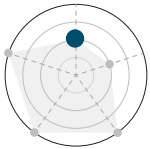
They have developed the toolkit with the Alliance into a Climate Resilience Measurement for Communities (CRMC) version to incorporate multi-hazards and be better suited to urban situations. They have announced several such expansion programs- a five-city US focused program with the Resilient Cities Network, a three-city focused program in Colombia with the Red Cross and a two-city program in Ecuador with Plan International- and are actively seeking additional opportunities for collective action in other countries across the world.

The Alliance does not focus on deploying new insurance models, thus very little core risk financing expertise is deployed. Its approach is to focus on ex-ante measures that manage risk believing that prevention is more effective than ex-post clean up. Analysis from the Alliance has demonstrated that for every \$1 spent on ex-ante resilience building, this reduces losses and ex-post costs by \$5 on average. The Alliance work therefore rests heavily on Resilience Analytics with strong activation through strategic philanthropy and stakeholder engagement.

## Insurance Capabilities Index

### Risk Finance

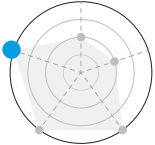
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The Alliance does not focus on deploying new risk transfer tools but does embed a series of risk finance concepts into its Flood Resilience Measurement Framework.

### Risk Analytics

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The Alliance actively deploys insurers' risk engineering and risk assessment expertise in low-income climate-vulnerable communities, primarily through the Flood Resilience Measurement for Communities tool.

### Impact Investing

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Not currently considered.

### Strategic Philanthropy

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The Alliance is funded primarily by the Z Zurich Foundation. By 2024, it is estimated that the Foundation will have invested over 75 million CHF to engage partners, conduct research locally, and advocate for local and global change.

### Stakeholder Engagement

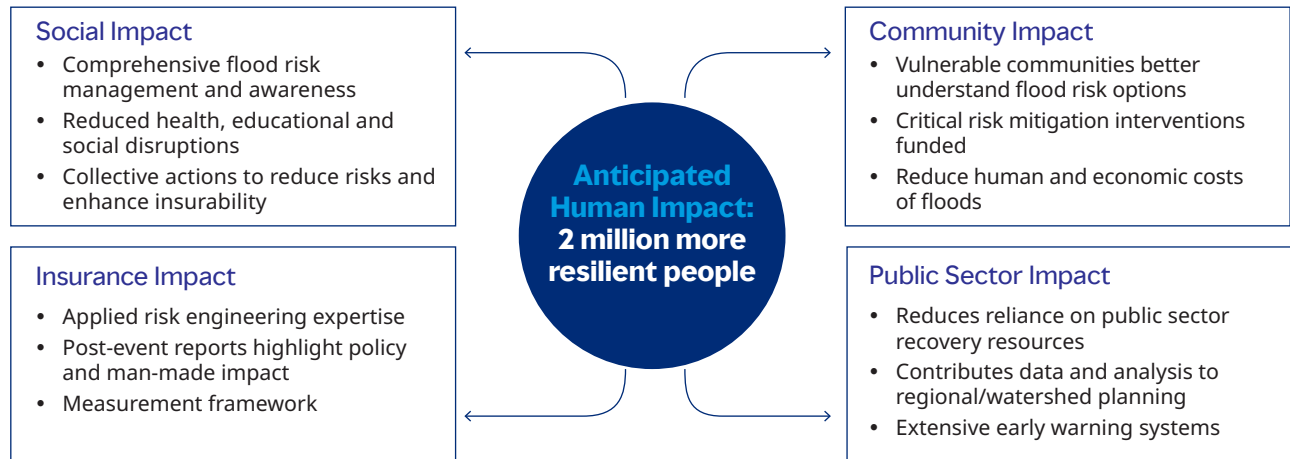
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Considering the on-the-ground focus of the program and the Flood Resilience Measurement for Communities tool, the Alliance relies heavily on direct engagement with local officials, citizens, civil society and other local actors. Some of this direct engagement is conducted by Zurich staff seconded to various projects.

# Impact

Full implementation of the Zurich Flood Resilience Alliance would generate positive impacts across a wide spectrum of stakeholders, communities and sectors:



# Engagement

The Alliance is a decade-old initiative that continues to expand in its second phase. It has an established set of existing partners. The Foundation is working to build on this for the future adding selected new implementation partners and geographies. They are also interested to bring in additional funding partners to expand the work further and are open to sharing the tools with other non-profit community programs.



# Key Contacts

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