



PSI
Principles
for Sustainable
Insurance

The PSI Global Resilience Project

Part three of a research series by the
UNEP FI Principles for Sustainable Insurance Initiative

Collaborating for resilience

Partnerships that build
disaster-resilient communities
and economies

The PSI Global Resilience Project is led by

iag





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LAUNCH VERSION

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1. The UNEP FI Principles for Sustainable Insurance Initiative

Endorsed by the UN Secretary-General and insurance CEOs and launched at the 2012 UN Conference on Sustainable Development, the UNEP FI Principles for Sustainable Insurance (PSI) serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities. Developed by the UN Environment Programme Finance Initiative (UNEP FI), the Principles have led to the largest collaborative initiative between the United Nations and the insurance industry—the PSI Initiative. As at November 2015, nearly 90 organisations have adopted the Principles, including insurers representing approximately 20% of world premium volume and USD 14 trillion in assets under management. The Principles are part of the insurance industry criteria of the Dow Jones Sustainability Indices, FTSE4Good, and Brazil's BM&FBOVESPA Corporate Sustainability Index.

The vision of the PSI Initiative is of a risk aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society. Its purpose is to better understand, prevent and reduce environmental, social and governance risks, and better manage opportunities to provide quality and reliable risk protection.

'The Principles for Sustainable Insurance provide a global roadmap to develop and expand the innovative risk management and insurance solutions that we need to promote renewable energy, clean water, food security, sustainable cities and disaster-resilient communities.'

Ban Ki-moon, UN Secretary-General

The Principles for Sustainable Insurance

- | | |
|--------------------|---|
| Principle 1 | We will embed in our decision-making environmental, social and governance issues relevant to our insurance business. |
| Principle 2 | We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions. |
| Principle 3 | We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues. |
| Principle 4 | We will demonstrate accountability and transparency in regularly disclosing publicly our progress in implementing the Principles. |

'The Principles for Sustainable Insurance are a foundation upon which the insurance industry and society as a whole can build a stronger relationship—one that puts sustainability at the heart of risk management in pursuit of a more forward-looking and better managed world.'

Achim Steiner, UNEP Executive Director & UN Under-Secretary-General

2. Executive summary

There is global recognition of the devastating impacts of natural disasters on lives, livelihoods and property. This, in turn, is undermining the overarching goal of economic, social and environmental sustainability—in other words, sustainable development. There is a need to embrace long-term strategies and approaches that build disaster resilience. The aim is to prevent, as much as possible, natural hazard events from becoming disasters that wipe out many years of hard-won development gains.

Governments are increasingly burdened by the fiscal, economic and social cost of natural disasters. From a community perspective, disaster resilience plays a critical role in saving lives and protecting livelihoods and property.

It is clear that one of the best ways forward is to harness the capabilities and strengths of all stakeholders—governments, non-governmental organisations (NGOs), communities and businesses—to develop and implement disaster resilience activities. The growing focus on disaster risk reduction and climate change adaptation can benefit from multi-stakeholder partnerships involving the insurance industry and the broader business community. In recent years, insurers have been active in establishing partnerships that connect stakeholders with governments to foster collaborative approaches towards disaster resilience.

Multi-stakeholder partnerships leverage the expertise and resources of government, businesses and NGOs and have a proven track record in managing risks and unlocking opportunities to address the growing need for investments in disaster resilience. These partnerships have been particularly helpful in providing governments and communities with insights on effective behavioural, ecosystem and structural measures to reduce disaster risk.

Partnerships on resilience-building activities are diverse, including how they take into account localised political, socio-cultural and economic circumstances. This breadth of activity highlights that disaster risk reduction and adaptation approaches usually require tailored activities and partnerships that meet the needs of a specific community, country or region. Certain initiatives highlight the importance of using data and research, including cost-benefit analysis, to formulate sound fiscal and economic perspectives, which underscore the value of upfront investments in disaster risk reduction.

Beyond understanding and reducing risk, the insurance industry plays the key role of carrying financial risk efficiently across the individual, national and international levels. Financial risk transfer instruments such as insurance provide protection by absorbing shocks that would otherwise be borne by households, businesses and governments.

Furthermore, physical risk reduction measures and financial risk transfer instruments are mutually reinforcing and are both important to achieving integrated disaster risk management. Insurance provides risk insights and incentives (e.g. risk and loss data, risk analysis and quantification, risk underwriting and pricing), which contribute to a better understanding of risk and more effective risk reduction measures.

Closing both the disaster risk reduction gap and the insurance protection gap is imperative to protecting development gains and to shaping disaster-resilient development pathways. In this context, UN global policy frameworks on disaster risk reduction, climate change and sustainable development culminating in 2015 offer an unprecedented opportunity for collaboration. These global frameworks are opportunities for the insurance industry to work together with governments and other key stakeholders in building disaster-resilient communities and economies, and in promoting sustainable development.

3. The insurance industry and disaster risk management¹

The insurance industry's core business is to understand, manage and carry risk. Through risk prevention and risk reduction and by sharing risks over many shoulders, the insurance industry helps protect society, fosters innovation and underpins economic development. As risk managers, risk carriers and investors, the insurance industry has a vital interest and plays an important role in fostering sustainable economic and social development. The risk management process in insurance spans a continuum of activity: from identifying, assessing, preventing and reducing risk, to pricing, carrying and diversifying risk. When unexpected losses arise, insurance helps communities cope with the financial hardship associated with these losses and help clients recover (see Figure 1 below).

Figure 1: The insurance risk management continuum



The risk management process in insurance mirrors the continuum of activity in disaster risk management—from understanding, assessing preventing and reducing disaster risk—to disaster response and relief, disaster recovery, and disaster risk financing (see Figure 2 below).

Figure 2: The disaster risk management continuum



For this reason, the insurance industry is actively involved in managing disaster risk, whether it stems from natural hazards (e.g. cyclones, earthquakes, floods, droughts), biological hazards (e.g. epidemics, animal and insect infestation) or technological hazards (e.g. industrial pollution, factory explosions, transport accidents). This includes disaster risk from a combination of hazards (e.g. natural and technological hazards).

¹ UNEP FI Principles for Sustainable Insurance Initiative, 'Harnessing the full potential of the insurance industry in disaster risk management, 2014), UNEP FI Principles for Sustainable Insurance Initiative

4. The PSI Global Resilience Project

4.1 Introduction

The PSI Global Resilience Project ('the Project'), led by IAG, aims to increase the awareness of natural disaster risk and shift the focus of governments, NGOs, communities and businesses to investing in upfront measures that reduce disaster risk, rather than focusing only on post-disaster relief and recovery. The Project seeks to do this by deepening the understanding of disaster risk reduction globally, assessing the social and economic cost of disasters, and identifying areas of high exposure and vulnerability.

Through the Project, PSI members will be better placed to provide information to governments, businesses, donors, NGOs and communities to help them better manage risk and, ultimately, help rebalance approaches to natural disaster risk through greater investment in disaster risk reduction. There is global recognition of the devastating impacts of natural disasters and the need to embrace long-term strategies and responses that build disaster resilience. Multi-stakeholder partnerships, including insurers, have a key role to play by providing expertise, capacity and resources for disaster risk reduction and disaster risk transfer solutions.

4.2 Phase I

Phase I—the '*Building disaster-resilient communities and economies*' report²—was launched at the inaugural PSI market event in London in June 2014, co-hosted by Aviva and Lloyd's of London. The report identified and assessed the effectiveness of a range of disaster risk reduction measures for cyclones, floods and earthquakes. The research focused on net economic and social benefits, and the cost to implement a particular disaster risk reduction measure relative to other options. It highlighted learnings from behavioural, ecosystem and structural disaster risk reduction measures and identified effective and actionable approaches that build disaster resilience.

4.3 Phase II

Phase II—the Global Risk Map³—was introduced at the Insurance 2030 Roundtable in Switzerland in May 2015, co-hosted by UNEP (bringing together the PSI Initiative and the UNEP Inquiry) and Swiss Re. It was formally launched at the UN headquarters in New York in June 2015 as part of the International Insurance Society's (IIS) Global Insurance Forum. The Global Risk Map covers major natural disasters over the past 115 years. The map highlights the social and economic devastation caused by cyclones, floods, earthquakes and related hazards, as well as areas and countries of high vulnerability to these natural hazards. The map achieves this by assessing relevant core data such as available disaster response resources and insurance penetration and density.

The Global Risk Map demonstrates the following data through an interactive tool:

- Exposure to cyclones, earthquakes, floods and related hazards (geo-coded)
- Cyclone, earthquake, flood and related hazard events since 1900 (country level)
- The economic and social impact of these hazard events (country level)
- National-level vulnerability to each of these natural hazards
- National-level resilience, covering vulnerability and coping capacity, including disaster risk reduction and insurance penetration and density (covering both life and non-life insurance)

The Global Risk Map uses Terria™ technology, built by National ICT Australia (NICTA). The underlying platform technology allows the user to benefit from huge datasets related to the project such as disaster

² See http://www.unepfi.org/fileadmin/documents/building_disaster-resilient_communities_economies_01.pdf

³ See : <http://globalriskmap.nicta.com.au/>

risk management resources and insurance penetration and density. Terria™ maps allow users to search spatial data catalogues through all major web browsers and provides a versatile and sophisticated operating experience. It is interoperable with a wide range of geographic information systems (GIS) back-end services and is Open Geospatial Consortium (OSG)-compliant.

4.4 Phase III

The Project's Phase I report and the Global Risk Map provide useful research and tools for engagement activities. In Phase II, the Global Risk Map helped identify highly exposed and vulnerable countries where PSI members could consider engagement activities. Moreover, it highlighted the key role of insurers as experts in understanding risk, and the importance of promoting risk awareness.

The final phase—Phase III—focuses on how to best approach global stakeholder outreach and engagement activities to support greater investment in disaster risk reduction in order to prevent and reduce natural disaster losses.

Phase III shows how multi-stakeholder partnerships in developed and developing countries (involving insurers, companies from other industries, governments, NGOs) have approached disaster risk reduction and built greater disaster resilience, as well as a range of innovative disaster risk transfer solutions to underscore the significance of integrated disaster risk management.

5. About this Report

Governments, businesses and communities have a shared interest in building disaster resilience. The insurance industry, through its triple role as risk managers, risk carriers and investors, plays a critical role in managing natural disaster risk. It is well placed to work with governments, businesses and communities in the areas of disaster risk reduction, climate change adaptation, and disaster risk transfer solutions. Insurers are increasingly leveraging their data, tools and skills to help governments and communities create better policies and make more informed decisions about how to avoid exposure to risk, reduce risk and transfer risk.⁴

This report features a range of case studies on multi-stakeholder partnerships for disaster risk reduction. It outlines partnership models as well as developmental, economic political, and socio-cultural considerations. This report also presents a range of innovative disaster risk transfer solutions in different countries and regions. By doing so, it shows how insurers are contributing to different activities across the disaster risk management continuum—from understanding, assessing, preventing and reducing disaster risk—to disaster response and relief, disaster recovery, and disaster risk financing. This underscores why the insurance industry is a key stakeholder in building disaster-resilient communities and economies.

⁴ KPMG International, 'Demystifying the public private partnership paradigm: the nexus between insurance, sustainability and growth', June 2015

6. Key learnings from partnerships for disaster risk reduction

6.1 Partnership models

Partnerships that address disaster risk reduction are diverse in terms of approach, membership and activities. This reflects the nature of building resilience, which usually requires tailored activities and partnerships to meet the needs of a specific community, country or region.

There are four partnership models for disaster risk reduction which characterise those covered in Section 7 of this report:⁵

- **Resource mobilisation partnerships** → The private sector, NGOs and donors provide or mobilise resources for disaster risk reduction
- **Implementation partnerships** → The private sector, NGOs and donors use their core competencies to implement disaster risk reduction activities
- **Innovation partnerships** → Private sector partners use their knowledge and expertise to implement technologies that support disaster risk reduction
- **Engagement and advocacy partnerships** → Multiple private sector actors, in combination with relevant NGOs, seek to raise awareness (especially among governments) of natural disaster risk and the need to embrace proactive disaster risk reduction policy approaches to build resilience

Of the eight partnerships for disaster risk reduction featured, half represent a combination of resource mobilisation and innovation partnerships:

- **The Bangladesh Cyclone Preparedness Programme** → Getting volunteers from coastal villages and developing creative ways of communicating risk awareness to communities
- **Myanmar's Earthquake Monitoring System** → Setting up a new digital database system for earthquake monitoring and training staff at Myanmar's Department of Meteorology and Hydrology
- **Vietnam's Thanh Hoa Mangrove Project** → Using the local community to perform manual tasks and surveying land for planting mangroves and for vulnerability and capacity assessments
- **The Philippines' Response to Typhoons Washi and Bopha** → Providing food, water, emergency supplies and humanitarian aid; and technological solutions to increase disaster preparedness and resilience, such as the Project NOAH (Nationwide Operational Assessment of Hazards) app to monitor weather and Smart Communications' redesign of transmission towers

The other four partnerships for disaster risk reduction are largely engagement and advocacy partnerships:

- **Australian Business Roundtable for Disaster Resilience and Safer Communities**
- **Disaster Risk Reduction Insurance (DERRIS) Climate Change Adaptation Project for SMEs and Municipalities in Italy**
- **Partners for Action (P4A) in Canada**
- **Resilient New Zealand**

⁵ The models used here are an extrapolation of those discussed in Global Public Policy Institute: 'Business Engagement in Humanitarian Response and Disaster Risk Management' (May 2015)

Each of these engagement and advocacy partnerships have focused on working collaboratively with their respective governments to effect change in public policy, to increase investment in disaster risk reduction and climate change adaptation, and to improve the capacity of people and businesses to withstand natural hazard events.

These partnerships highlight that insurers are well placed to build multi-stakeholder partnerships for disaster risk reduction and participate in policy discussions that promote risk-informed development pathways. Insurers can help identify the appropriate scale and scope of engagement (e.g. targeting municipal governments, national policymakers, regulators and other decision-makers), as well as developing a clear strategic plan, including a structured approach for implementation and follow up. Identifying a specific organisation to act as an implementing body or network host (e.g. a university or NGO) has proven to be a useful approach for carrying actions forward.⁶

Furthermore, the DERRIS public-partnership in Italy shows how all four partnership models outlined above could be innovatively captured by one insurer-led project.

Meanwhile, the case studies on disaster risk transfer solutions in Section 8 demonstrate that insurers are playing an increasingly important role at the individual/household, national and international levels by carrying risks efficiently and helping communities, business and governments absorb financial shocks due to natural hazard events. In addition to being partnerships, innovation is central to and a common feature in all of these solutions—such as the use of index-based insurance, simplified claims management, and the use of insurance loss data for climate-resilient development planning.

6.2 Developmental and economic considerations

Developmental and economic issues have had a significant impact on the collaborative activities profiled in Section 7. For example, engagement and advocacy activities in Australia and Canada recognise the fiscal burden that recent natural disasters have placed on their governments as a result of their respective disaster funding arrangements. Moreover, the partnerships established in each country have focused on building disaster resilience as the most appropriate and fiscally prudent approach.

Conversely, collaborative activities pursued in countries under the resource mobilisation and innovation model (i.e. Bangladesh, Myanmar, Philippines, The Philippines) were largely based on the need for funding from international donors and the private sector, technology transfer, and NGO project management. In any case, each of these projects made a significant contribution to building disaster resilience. Communities also benefited from the positive environmental and economic outcomes of the projects, such as the return of crustaceans following mangrove restoration in Vietnam, and information technology improvements in the Philippines.

Meanwhile, the innovative risk transfer solutions featured in Section 8 show that insurance is a key element of disaster resilience across developed and developing countries. National-level mandatory insurance schemes have been helpful in developed countries (e.g. New Zealand, Japan), while regional/international arrangements are showing how they can help highly vulnerable communities in developing countries absorb shocks—the R4 Rural Resilience Initiative (Africa), African Risk Capacity, Caribbean Catastrophe Risk Insurance Facility, and Pacific Catastrophe Risk Assessment and Financing Initiative (Pacific island countries).

⁶ UNEP FI: 'Insurance 2030: Harnessing Insurance for Sustainable Development', Inquiry-PSI Working Paper, 15/01 (June 2015)

6.3 Political and socio-cultural considerations

Political and socio-cultural considerations closely parallel developmental and economic considerations. Governments are increasingly being burdened by the significant fiscal, economic and social cost of natural disasters. Natural disasters in Australia, New Zealand and Canada elevated natural disaster risk in the eyes of constituents and made each government cognisant of the need to do more to protect lives, livelihoods and property. In the case of Canada, this commitment went a step further and required the political and policy support necessary for underwriting flood insurance.

The experience of most governments in developing countries covered in this report was not altogether different. Collaborative resilience-building activities have been supported by high-level political commitment. A major difference, in broad terms, has been capacity shortages (e.g. funding, technology) and competing, although sometimes related, socio-economic priorities. In such instances, the contributions of the private sector, NGOs and international development organisations have been critical in building disaster resilience.

7. Partnerships for disaster risk reduction

7.1 Australian Business Roundtable for Disaster Resilience and Safer Communities

The Australian Business Roundtable for Disaster Resilience and Safer Communities demonstrates how a coalition of diverse stakeholders can deliver a multi-faceted, integrated approach to build long-term community resilience to natural hazards. The Roundtable's activities also underline the value of a White Paper in providing sound economic arguments and modelling that clearly demonstrate the fiscal and social value in investing in upfront disaster risk reduction measures.

Type of partnership	Years active	Activities	Key achievements
Engagement/Advocacy	3 years (since 2012)	Working collaboratively with the Australian federal government to effect change in public policy and increase investment aimed at building safer and more resilient communities. To actively improve the capacity of people and businesses to better withstand natural hazards.	Catalyst for the Australian Productivity Commission's Inquiry into Natural Disaster Funding Arrangements which recommended AUD 200 million investment in pre-disaster mitigation. The Inquiry's final report, released in May 2015, closely reflect the policy approach proposed by the Roundtable.

Natural hazard event

2011 was the worst year on record for natural hazard events (e.g. floods, cyclones, hailstorms, bushfires) in Australia, resulting in total economic losses of around AUD 10 billion (USD 7 billion) incurred in that year alone.^{7 8 9} There was a devastating toll on lives, property and businesses and a psychological impact on families and communities. In the state of Queensland alone, insured losses from catastrophes in 2011 were around AUD 3.4 billion (USD 2.4 billion)¹⁰ with the Queensland government incurring over AUD 6.5 billion (USD 4.6 billion) in reconstruction and recovery costs.¹¹

Context

In May 2012, IAG sponsored the Risk Matters Summit. The Summit included 80 representatives from a wide cross section of stakeholders (e.g. corporates, insurance customers, emergency services, the Australian government, UNEP) to identify what IAG needed to do to be leaders in risk management. Key considerations included how IAG could move beyond financial protection and recovery to helping Australian communities better understand risk, prevent and reduce loss, and manage natural hazard events when they occurred, with a view to building more resilient communities over the long term. Five key themes emerged from the Summit, one of which was to address 'natural perils and the built environment risk'. The Summit helped IAG identify key issues, resources and sectors necessary to building a meaningful coalition that could address these challenges, ranging from land use, property development, building construction, home protection and disaster preparedness, to insurance, reinsurance, financing and disaster response.

Partners

IAG initiated the formation of the Australian Business Roundtable for Disaster Resilience and Safer Communities in December 2012. The Roundtable is a multi-stakeholder, cross-industry partnership covering diverse sectors including insurance (IAG), banking (Westpac), telecommunications (Optus), property development (Investa), reinsurance (Munich Re), and not-for-profit (Australian Red Cross). Each

⁷ Australian Government, Commission of Audit, 10.9.2014: <http://www.ncoa.gov.au/report/appendix-vol-2/10-9-natural-disaster-relief.html>

⁸ National Disaster Relief & Recovery Arrangements: <http://www.disasterassist.gov.au/NDRRADetermination/Pages/default.aspx>

⁹ Insurance Council of Australia, Catastrophe Database.

¹⁰ Ibid

¹¹ Queensland Reconstruction Authority Report – Program Status, January 2015: <http://qldreconstruction.org.au/u/lib/cms2/january-2015-program-status.pdf>

Roundtable member has a direct exposure to natural hazard events and their impacts. Roundtable members also believe it is of national importance to make Australian communities safer and more resilient to natural hazards and share an interest in developing sustainable long-term solutions that can better protect lives and property.

Activities

The Australian Business Roundtable's vision is to work collaboratively with the Australian government to effect change in public policy and increase investment aimed at building safer and more resilient communities; and to actively improve the capacity of people and businesses to better withstand natural hazards.

Resources

The Roundtable's White Paper '*Building Our Nation's Resilience to Natural Disasters*'¹² was launched in June 2013. The White Paper called for a commitment to long-term annual consolidated funding for pre-disaster resilience, and the identification and prioritisation of pre-disaster investment activities that deliver a positive net impact on future budget outlays. In doing so, the White Paper detailed a more sustainable and comprehensive approach to managing natural disaster risk that could ultimately save lives, reduce damage to property and vital national infrastructure, and free taxpayer money to spend on essential public services.

A White Paper is a key vehicle for delivering a multi-faceted, integrated approach to build long-term community resilience to natural hazards. It has the capacity to draw together the critical strands of policy—land use planning, building codes, mitigation infrastructure, emergency response, taxation and community education—that underpin effective and enduring disaster resilience. A White Paper can also provide sound economic arguments and modelling (cost-benefit ratios), that clearly demonstrate the fiscal and social value in investing in upfront disaster risk reduction measures, ahead of response and recovery. At the same time, a White Paper can also provide the framework for cooperation and collaboration between all levels of government, industry and community.

The White Paper included case studies on socially and economically vulnerable Australian communities that practically illustrate how preventative spend now saves money into the future. These showed that:

- A programme focusing on building more resilient new homes in high cyclone risk areas of South East Queensland would reduce cyclone risk for these homes by 66% and would save three dollars for every dollar spent up front
- Flood mitigation in the Hawkesbury-Nepean by raising the Warragamba Dam wall 23 metres would reduce flood costs between 2013 and 2050 from AUD 4.1 billion to AUD 1.1 billion, saving AUD 3 billion (more than eight dollars for every dollar spent upfront)
- Bushfire mitigation in Victoria focused on vegetation management and reducing ignition sources would have a positive cost-benefit ratio of 3:1.

Importantly, the White Paper's policy recommendations and assessments were based upon extensive data and research undertaken by Deloitte Access Economics on behalf of the Roundtable. These included:

- The Australian Government invests AUD 50 million each year in pre-disaster mitigation measures but more than AUD 560 million on post-disaster recovery (i.e. For every 10 dollars spent on post-disaster recovery, only one dollar is spent on pre-disaster mitigation)
- The total economic costs of natural disasters in Australia average AUD 6.3 billion annually and, due to growth and urbanisation, are projected to rise to AUD 23 billion by 2050

¹² Deloitte Access Economics, '*Building our Nation's Resilience to Natural Disasters*', Australia, June 2013: <http://australianbusinessroundtable.com.au/assets/documents/White%20Paper%20Sections/DAE%20Roundtable%20Paper%20June%202013.pdf>.

- Carefully targeted investment in preventative infrastructure of AUD 250 million per year would reduce these costs by 50%, generating economic savings of AUD 12.2 billion by 2050

The Roundtable's second research paper '*Building an Open Platform for Natural Disaster Resilience Decisions*' underlined the imperative that communities, businesses, governments and individuals have access to the latest research founded on accurate data to enable more informed decisions on how best to build property and infrastructure and protect communities from natural hazards. The report underscored the value of single point access to critical data.¹³

Achievements

The Australian Business Roundtable's strategic approach and its use of credible data and research have enabled it to become an important and effective coalition. The Roundtable has been a catalyst for the Australian government's Productivity Commission Inquiry into Natural Disaster Funding Arrangements, which recommended AUD 200 million investment in pre-disaster mitigation. The Inquiry's final report, released in May 2015, closely reflect the policy approach proposed by the Roundtable.

In December 2013, the Roundtable won an Australian government National Resilient Australia Award for its contribution to public policy to help government, business and communities better prepare for natural hazards. In March 2015, at the 3rd UN World Conference on Disaster Risk Reduction in Sendai, Japan, the Roundtable was awarded the certificate of distinction in the prestigious 2015 UN Sasakawa Awards for Risk Reduction—the first private sector organisation to do so in the 30-year history of the awards.

7.2 Cyclone Preparedness Programme (Bangladesh)

Bangladesh's Cyclone Preparedness Programme (CPP), an initiative sponsored by the International Federation of Red Cross and Red Crescent Societies (IFRC), the Bangladesh Red Crescent Society (BRCS), and the Government of Bangladesh, has played a key role in building local capacity and resilience to cyclones.

Type of partnership	Years active	Activities	Achievements
Resource mobilisation /innovation	43 (since 1972)	The CPP sought to increase the disaster preparedness and response capacity of coastal communities by establishing a warning system and training volunteers and officers to respond effectively to cyclones.	The success of the CPP was demonstrated during the 1997 cyclone, an event of a similar scale to the 1970 cyclone, which killed 500,000 people. The effective response of volunteers and communities enabled the evacuation of one million people to cyclone shelters, reducing the death toll to 193.

Natural hazard event

In 1970, a major cyclone hit Bangladesh causing a 6-to-9-metre storm surge, which resulted in severe damage to coastal homes and approximately 500,000 fatalities.¹⁴

Context

The CPP was launched in 1972 in response to the 1970 cyclone. The on-going project seeks to build local capacity and resilience to cyclones in order to prevent and reduce economic damage and loss of life.¹⁵

Partners

¹³ Deloitte Access Economics, 'Building an Open Platform for Natural Disaster Resilience Decisions' July 2014:

<http://australianbusinessroundtable.com.au/white-paper/research-report>

¹⁴ APDC, Total Disaster Risk Management - Good Practices - Chapter 3

¹⁵ Ibid

Coalition partners were the IFRC, BCRS and the Government of Bangladesh. BCRS is the Bangladeshi branch of the IFRC and was established in 1973 as an NGO. The BCRS works towards providing humanitarian relief.¹⁶

Activities

The CPP established an early warning system and trained volunteers and officers to respond effectively to cyclones. The system consists of 143 wireless radio stations used to transmit warning messages to around 11 million people living across 11 coastal districts.¹⁷ Information from the Bangladesh Meteorological Department is first transmitted to zonal offices using high-frequency radio systems and then to unions using very high-frequency radios.¹⁸ Members then contact the volunteers who spread the warning signals through their local villages using megaphones, signal flags and manual sirens.¹⁹

In addition, 1,600 shelters were constructed in coastal areas and volunteers trained in first aid and search and rescue. The CPP used creative methods for communicating risk awareness to communities, including posters and publications, staging dramas in public areas, developing folk songs, and public rallies before the start of the cyclone season.²⁰

Resources

The CPP operates under the partnership of the BCRS, which provides funding and expertise, and the Government of Bangladesh. Its management structure consists of a policy committee and implementation board headed by the Minister and Secretary of the Ministry of Disaster Management and Relief, respectively.²¹ The CPP early warning system also involved the construction of radio networks and cyclone shelters.

Achievements

The success of the CPP was demonstrated during the 1997 cyclone, an event of a similar scale to the 1970 cyclone. The effective response of volunteers and communities enabled the evacuation of one million people to cyclone shelters, reducing the death toll to 193.²² In response to its effectiveness as a disaster management initiative, the CPP was awarded the Smith Tumsaroch Award in 1998.²³ By 2014, the CPP had trained over 49,000 volunteers across 13 coastal districts.²⁴

7.3 Disaster Risk Reduction Insurance (DERRIS) Climate Change Adaptation Project for SMEs and Municipalities (Italy)

The DERRIS project shows how an insurer-led, public-private partnership on climate change adaptation for small and medium-sized enterprises (SMEs) and municipalities can deliver systemic, innovative and scalable approaches, and harness a comprehensive set of competencies and resources from various stakeholders to build resilience.

¹⁶ Bangladesh Red Crescent Society, 'History of BDRCS', 2013, <http://www.bdracs.org/history-bdracs>

¹⁷ International Association for Wind Engineering, 'Cyclone Preparedness Programme (CPP): Concept Paper', http://www.iawe.org/WRDRR_Bangladesh/Preprints/S4CPP.pdf

¹⁸ Ibid

¹⁹ Ibid

²⁰ 'Overview of the Cyclone Preparedness

Programme', http://typhooncommittee.org/SSOP/Training/DAY%20%20PDF/6_CPP%20Presentation-1.pdf

²¹ M. R. Khan & M. A. Rahman, 'Partnership approach to disaster management in Bangladesh: A Critical Policy Assessment' (2007)

²² APDC, Total Disaster Risk Management - Good Practices - Chapter 3

²³ Cyclone Preparedness Programme, 'History', 2014, <http://www.cpp.gov.bd/site/page/8fafc5ba-1afb-4ac9-a7ee-67a29a58343a/History>.

²⁴ Ibid

Type of partnership	Years active	Activities	Key achievements
Resource mobilisation/ Implementation/ Innovation/ Engagement and advocacy	2 months (since October 2015)	The DERRIS project aims to transfer climate and disaster risk management knowledge and expertise to SMEs and municipalities; develop climate risk assessment tools and financial instruments for adaptation solutions; and implement company and district adaptation plans	Implementation of pilot phase currently in progress in Turin.

Natural hazard event

The Mediterranean region is expected to face particularly negative climate change impacts over the coming decades. Combined with the effects of natural resource stress and relatively lower adaptive capacity, this makes the region one of the most vulnerable areas in Europe. The projected negative impacts are mainly related to higher frequency of extreme weather events (e.g. severe rainfalls, heat waves and droughts) and reduced annual precipitation river flow. In this context, Italy expects a number of potential climate change impacts and vulnerabilities, particularly hydro-geological risks such as landslides, flash mud/debris flows, rock falls, floods and flash floods, and coastal zone erosion. According to Legambiente, an Italian environmental NGO, more than 80% of municipalities and more than 500,000 companies in the country are located in areas exposed to hydro-geological risk. Major differences in terms of economic impacts of climate change could also emerge between northern and southern Italy.

Context

The European Commission's Green Paper on the Insurance of Natural and Man-made Disasters articulates that insurers can concretely contribute to developing and implementing disaster risk management policies that build resilience to natural hazards, particularly given insurers' expertise in risk assessment. However, public authorities and SMEs do not have sufficient understanding of and skills to manage disaster risk, and to recover from disasters. This is compounded by insufficient insurance coverage against natural hazards in Italy, and the lack of incentives to prevent and reduce disaster risk. While SMEs represent the vast majority of the Italian economy (including 80% of its workers), they do not have adequate risk assessment tools for climatic hazards and have limited resources to invest in resilience measures.

Research in 2014 by CINEAS, a consortium of risk management experts, showed that 63% of 701 SMEs interviewed did not have risk management procedures in place. Further, research by the Italian Association of Insurance Brokers (AIBA) found that 90% of SMEs that have suffered a loss—and which resulted in stopping production for over a week—go bankrupt within a year. These studies demonstrate the need to build the adaptation capabilities of SMEs, both in terms of risk assessment and disaster recovery.

Partners

The DERRIS project is co-financed by the European Commission, with Unipol Gruppo Finanziario, a Bologna-headquartered financial institution with insurance and banking business, as coordinating beneficiary. Project partners include the National Association of Italian Municipalities (ANCI), CINEAS, the City of Turin, and the Local Agenda 21 Network (an association of local governments for sustainable development).

Activities

The main objectives of the DERRIS project, which was launched in October 2015 in Turin and will run until 2018, are to:

- Design and implement an innovative private-public partnership on climate change adaptation and resilience involving SMEs, public administrators and the insurance industry

- Transfer climate and disaster risk management knowledge and experience from the insurance industry to SMEs and municipalities in order to create more resilient companies, strengthen local economies, and realise effective local adaptation plans
- Develop a climate risk management tool for SMEs to improve risk awareness, assessment, prevention and reduction, both at the company and district levels
- Develop and test innovative financial instruments for adaptation solutions

Unipol will use its expertise in risk management—from risk assessment to disaster recovery—to design specific tools and instruments for SMEs and municipalities to increase their risk awareness and build the resilience of industrial districts. Project activities include analysis of select districts and SMEs, building the capacity of nominated adaptation managers, and developing and implementing company and district adaptation action plans.

Resources

The project's aims and outputs will be promoted via communication platforms such as the DERRIS website, the DERRIS adaptation community, and through project partners.

Achievements

The project started its pilot phase in Turin, and will extend to other Italian cities including Bologna, Genoa, Pordenone and Vicenza.

7.4 Earthquake Monitoring System (Myanmar)

The Myanmar earthquake monitoring system, a joint initiative sponsored by the Asian Disaster Preparedness Center (ADPC), the Royal Norwegian Ministry of Foreign Affairs, the University of Bergen (Norway) and the Myanmar Department of Meteorology and Hydrology, has significantly enhanced Myanmar's capacity to monitor and prepare for earthquake events.

Type of partnership	Years active	Activities	Achievements
Resource mobilisation /innovation	4 years (since 2012)	To improve the earthquake monitoring systems used by Myanmar's Department of Meteorology and Hydrology by introducing a new digital database system that integrates information from nine different monitoring centres across Myanmar.	More accurate observation and assessment of earthquake risk through the integration of seismic monitoring information from multiple stations.

Natural hazard event

Earthquake vulnerability and low forecasting and coping capacity

Context

The cities of Mandalay and Yangon sit on a significant earthquake fault line and are at constant risk of earthquakes. The fault line has not exhibited significant seismic activity for the past 50 to 75 years, which might mean that stress is accumulating in the fault and could result in a strong seismic event. Urbanisation is increasing the number of people and infrastructure at risk in these cities.

Partners

Partners included the Royal Norwegian Ministry of Foreign Affairs, ADPC, University of Bergen, and the Myanmar Department of Meteorology and Hydrology. The ADPC is an NGO established in 1986 and has been working on resilience initiatives for Myanmar since 2008. It uses disaster risk management

information to assess disaster risk and build resilience.²⁵ The University of Bergen is an internationally-recognised research facility.²⁶

Activities

The initiative aims to improve the earthquake monitoring systems used by Myanmar's Department of Meteorology and Hydrology through the introduction of a new digital database system.²⁷ The database enables the integration of information from nine different monitoring centres across Myanmar and the conversion of existing monitoring stations from analogue to digital technology.²⁸ The University of Bergen conducted training workshops in seismology, seismic instruments, data processing and the operation of seismic networks to facilitate the shift to digital technology.²⁹ Local technical officers were trained in site surveying to build expertise in choosing locations for new monitoring stations where instruments would not be interrupted by background noise or vibration.³⁰

Resources

The initiative involved the training and capacity building of local staff to implement new technology for seismic monitoring. The University of Bergen provided experts to conduct training programmes. The development of the digital database was funded by the Royal Norwegian Ministry of Foreign Affairs.³¹

Achievements

The new digital database integrates seismic monitoring information from multiple stations to more accurately monitor seismic activity and analysis.³²

7.5 Partners for Action (P4A) (Canada)

P4A demonstrates how targeted data and research can drive coalition-building and lead to a broader public policy discussion on risk-based solutions. P4A built momentum by engaging a diverse group of stakeholders, NGOs and three levels of government. P4A provides a collaborative forum to build flood resilience.

Type of partnership	Years active	Activities	Achievements
Engagement/Advocacy	1 year (since 2014)	To engage diverse stakeholder groups on the risks of overland and urban flood in Canada and to encourage Canadian decision-makers to make sound adaptation decisions aimed at protecting homes, businesses, infrastructure and communities. P4A also focuses on steps to ensure Canadians have access to insurance covering risks associated with flood damage.	In May 2015, The Co-operators became the first Canadian insurer to bring a homeowner's flood insurance product to the market. Aviva Canada followed, with other insurers planning to bring flood insurance products as well.

Natural hazard event

The 2013 Calgary, Alberta floods were the most expensive natural disaster in Canada's history. Swiss Re ranked the event as the third-largest natural disaster globally in 2013, resulting in USD 6.9 billion in economic losses and USD 1.9 billion in insured losses.³³

²⁵ ADPC, 'ADPC at a Glance', 2014, <http://www.adpc.net/igo/contents/adpcpage.asp?pid=2>

²⁶ University of Bergen, <http://www.uib.no/en>

²⁷ ADPC, 'Now a reality: Integrated earthquake monitoring in Myanmar', Dec 2014

²⁸ Ibid

²⁹ Lars Ottemøller, 'Seismology in Asia' (18 March 2015), <http://www.uib.no/en/rg/geodyn/87085/seismology-asia>

³⁰ Ibid

³¹ Ibid

³² ADPC: Now a reality: Integrated earthquake monitoring in Myanmar, Dec 2014

³³ Swiss Re, 'Sigma 1/2014: Natural Catastrophes and man-made disasters', 2013

Context

By 2012, it was clear that Canada was experiencing more frequent and severe floods. However, the insurance industry was not offering a homeowner's overland flood insurance product. The 2013 Alberta floods elevated the importance of flood risk reduction and flood insurance with the Canadian federal government since it was responsible for 90% of the cost of the damage due to its ownership of the Federal Disaster Relief Programme. The fiscal burden of the programme following the Alberta floods almost resulted in the Canadian central government not reaching its deficit targets.

Prior to the 2013 Alberta floods, The Co-operators had identified the lack of availability of flood cover as an important community concern and commissioned Dr Blair Feltmate of the University of Waterloo to research the barriers and opportunities to Canadian insurers providing flood cover. His 2013 report, *'Assessing the Viability of Overland Flood Insurance: The Canadian Residential Property Market'*³⁴ examined the thoughts of senior insurance executives. It revealed that while insurers were concerned about the lack of flood insurance in Canada, they were divided on its viability. Insurers also expressed significant concern about the sustainability of the existing federal government flood recovery system (i.e. Disaster Financial Assistance Arrangements).

In particular, the study identified low investment in flood risk adaptation and protection as a flaw in the existing system. The study recommended a broad-based discussion on the actions necessary to improve flood and disaster risk management among all stakeholders and research on flood risk exposure levels across Canada, prioritising those with high population densities. The Co-operators used the study, as well as the 'Building Our Nation's Resilience to Natural Disasters' White Paper of the Australian Business Roundtable for Disaster Resilience and Safer Communities, to engage Canadians in a national discussion on floods from adaptation, underwriting and product perspectives.

In 2014, The Co-operators commissioned a second report by Dr. Feltmate, *'Partners for Action: Priorities for Advancing Flood Resiliency in Canada'*.³⁵ The study explored approaches of a broad range of stakeholder groups representing all levels of government, NGOs and a range of industries.

Partners

In June 2014, The Co-operators convened the first Partners for Action (P4A) sponsored activity—a Flood Resilience Roundtable. The event facilitated the engagement of diverse stakeholder groups in adaptation efforts. Approximately 70 senior executives representing insurers, reinsurers, banks, real estate developers, builders, government (three levels: municipal, provincial and federal) and NGOs attended the Roundtable.

The Roundtable set three guiding principles that would direct future P4A work:

- For Canadians to understand the risk that overland and urban flood presents to their homes, businesses and communities
- For Canadian decision-makers to use their understanding of flood risk to make sound adaptation decisions aimed at protecting homes, businesses, infrastructure and communities
- Steps to ensure Canadians have access to risk transfer instruments covering flood damage

The Roundtable also identified three priority areas where action could most effectively reduce the risk of flood damage:

³⁴ 'Assessing the Viability of Overland Flood Insurance: The Canadian Residential Property Market', University of Waterloo, September 2013. See <https://www.cooperators.ca/en/.../extreme-weather-and-insurance.aspx>

³⁵ 'Partners for Action: Priorities for Advancing Flood Resiliency in Canada', University of Waterloo, May 2014. See <https://www.cooperators.ca/en/.../extreme-weather-and-insurance.aspx>

- Flood plain mapping — New flood plain maps with projections that anticipate changes in the intensity and duration of weather events
- Preparedness of cities — The preparedness of major cities for extreme weather and flooding
- Built infrastructure — The need to factor in extreme weather and flood potential into new infrastructure designs and retrofits

Following the Roundtable, The Co-operators and Farm Mutual Reinsurance Plan co-founded a formal P4A Network housed at the University of Waterloo's Faculty of Environment. The P4A co-founders seeded the USD 1.4 million to start the initiative. With a dedicated Director, P4A has an Advisory Committee and a Stakeholder Group (i.e. a diverse group of participants who support flood resilience).

Activities

'*Preparedness of Fifteen Canadian Cities to Limit Flood Damage*'³⁶, a further report by Dr Feltmate commissioned by The Co-operators, was published in May 2015 and ranked 15 Canadian cities according to their level of flood preparedness. The purpose of the report was to incentivise municipal authorities to improve preparedness and share learnings on adaptation initiatives.

Achievements

In May 2015, The Co-operators became the first Canadian insurer to bring a homeowner's flood insurance product to the market. This happened in Alberta, with the plan to rollout across the country by the end of 2016. Aviva Canada followed with other insurers planning to bring flood insurance products to the market. P4A is also considering further research on the monetisation of the cost of action versus inaction.

7.6 Resilient New Zealand

Similar to the Australian Business Roundtable for Disaster Resilience and Safer Communities, Resilient New Zealand seeks to demonstrate how a coalition of diverse stakeholders can deliver an integrated approach to long-term community and economic resilience to natural hazards.

Type of partnership	Years active	Activities	Achievements
Engagement/Advocacy	4 months (since August 2015)	Resilient New Zealand aims to lessen the impact of natural hazard events and provide for better recovery when they occur. Its first project, 'Improving the Role of Business in Recovery', focuses on improving the role business plays in three areas: building resilience; leading recovery; and collaborating with others.	Implementation of first project currently in progress. Report to be launched in December 2015, and advocacy programme to start in 2016.

Natural hazard event

The Canterbury earthquakes in 2010 and 2011 killed 185 people and resulted in economic losses of USD 31.6 billion.³⁷

Context

Despite New Zealand having among the highest global take-up rates for earthquake insurance across both personal and commercial lines, the New Zealand government carried a heavy economic burden through its coverage of losses of up to NZD 100,000 for each risk under the New Zealand Earthquake

³⁶ See <https://www.cooperators.ca/en/.../extreme-weather-and-insurance.aspx>

³⁷ Swiss Re, 'Natural catastrophes and man-made disasters in 2011: historic losses surface from record earthquakes and floods', 2/2012

Commission.³⁸ The events reaffirmed that natural hazard events are a national strategic risk in New Zealand, especially given its size (2013 figures – population: 4.47 million; GDP: USD 185 billion). The earthquakes also gave fresh impetus to New Zealand’s need to invest more in building resilience to all types of natural disasters.

Following the Canterbury earthquakes, there have been several initiatives aimed at developing a coordinated focus on disaster risk reduction. For example, the Insurance Council of New Zealand has addressed important issues such as variations in the quality of information and access to information on natural hazards, legal inconsistencies, the need to better explain risks faced, how to reduce impacts, and the need for better coordination at the central government level.

With a focus on applying the company’s risk and insurance expertise to improve risk management, IAG New Zealand commissioned PwC to help develop a model for a multi-stakeholder platform for research and action.

Partners

Resilient New Zealand was formally launched in August 2015 by a group of like-minded organisations (i.e. IAG, Beca, Vodaphone, BNZ, and the Red Cross) seeking to identify, champion and advocate for ways to help make New Zealand more resilient to natural disasters.

Activities

Resilient New Zealand aims to reduce the impact of natural hazard events and support better recovery when disaster strikes. The initiative’s first project is improving the role of business in recovery, focusing on three areas: building resilience, leading recovery, and collaborating with others. Building resilience focuses on how to improve business preparedness and agility and its contribution to community resilience. Leading recovery focuses on improving the governance and decision-making structures that enable business to contribute to recovery and how business enables the leadership of others. The project is also examining how to improve the level and effectiveness of collaboration between organisations and across sectors.

In each of these three focus areas, the project draws on the experience of business and community leaders in Canterbury to:

- Identify and advocate for improved practices by businesses in respect of planning for, responding to, and recovering from disasters
- Advocate for central and local government practices and reforms that will create the right enabling environment for businesses to contribute to recovery
- Reinforce or redirect business, government and public expectations

Resources

Resilient New Zealand has conducted structured interviews with central and local government, community and business leaders either involved in or heavily exposed to the recovery in Canterbury. A report with key findings and recommendations will be launched in December 2015, followed by an advocacy programme in early 2016.

7.7 Response to Typhoons Washi and Bopha (The Philippines)

This case study on typhoons in the Philippine explains the key roles of public, private and civil society stakeholders in leading disaster preparedness and disaster response activities.

³⁸ New Zealand Earthquake Commission website, ‘What We Do – EQC Insurance’ See: <http://www.eqc.govt.nz/what-we-do/eqc-insurance>

Type of partnership	Years active	Activities	Achievements
Resource mobilisation/ Innovation	4 years (since 2011)	Response, reconstruction, resettlement and the implementation of disaster risk reduction activities following two major typhoons.	Better preparedness for typhoon events. The success of disaster preparedness measures was reflected in the lower death toll of Typhoon Bopha compared to Typhoon Washi.

Natural hazard event

Typhoon Washi, a category 2 typhoon, hit the island of Mindanao on 16 December 2011 causing severe flash flooding and landslides. Over 1.1 million people were displaced and 1,257 died in the disaster. Typhoon Bopha made landfall as a category 5 typhoon in Mindanao on 4 December 2012. It is the most severe tropical cyclone the island has suffered, and the damage it caused impacted over 6 million people.³⁹

Partners

The Philippines' Department of Science and Technology (DOST), National Disaster Risk Reduction and Management Council (NDRRMC), the Armed Forces of the Philippines (AFP), San Miguel Corporation (SMC), Petron Foundation Inc. (PFI), Smart Communications, Telecoms sans Frontier (TSF), Xavier University-Ateneo de Cagayan, and the Vodafone Foundation. The NDRRMC is responsible for developing and managing the implementation of the National Disaster Risk Reduction and Management Framework developed by the government. SMC is the Philippines' largest beverage, food and packaging company. Petron Corporation is a major Philippine oil refining and marketing company, and PFI is Petron's corporate social responsibility arm involved in community initiatives.⁴⁰ Smart Communications is a major Philippine mobile telecommunications operator. TSF is an international NGO.

Activities

Response

The coordinated efforts of these disparate organisations ensured effective provision of emergency supplies, food and humanitarian assistance. The AFP played a central role in evacuation processes, partnering with the Office of Civil Defence to transport relief supplies.⁴¹ The AFP also assisted the delivery of communications equipment and transport for Smart Communications' engineers to restore telecommunications services.⁴² Emergency communication services were provided by Smart in cooperation with the Vodafone Foundation and TSF. Smart's engineers implemented adjustments to their network to allow the operation of TSF's 'ultraportable' mobile network (i.e. the Vodafone Foundation Instant Network) to provide reliable network coverage. Private sector companies were also instrumental in funding and coordinating various initiatives to rebuild impacted communities. For example, PFI partnered with the AFP's military engineers to rebuild damaged schools.⁴³

Resettlement

San Miguel Foundation Inc. (SMFI) played an active role in identifying locations for community resettlement. SMFI also provided alternative livelihoods for the relocated individuals.⁴⁴ The establishment of an ecologically-friendly 'village' provided shelter and improved water sanitation and hygiene for over 560 families. Furthermore, it created livelihood opportunities and benefitted Xavier University-Ateneo de Cagayan by enabling students and staff to continue attending the university following Typhoon Washi.⁴⁵

³⁹ Humanitarian Futures Programme: 'Private sector engagement and collaboration with civil-military actors in disaster management in the Philippines: Typhoons Washi and Bopha and beyond', King's, College London (December 2013)

⁴⁰ Petron Corporation, 'About Petron Foundation', 2011, <http://www.petron.com/csr.html>

⁴¹ Humanitarian Futures Programme: 'Private sector engagement and collaboration with civil-military actors in disaster management in the Philippines: Typhoons Washi and Bopha and beyond', King's, College London (December 2013)

⁴² Ibid

⁴³ Ibid

⁴⁴ Ibid

⁴⁵ Ibid

Disaster preparedness and resilience initiatives

Smart Communications launched Project NOAH (Nationwide Operational Assessment of Hazards) in partnership with the Philippine government's Department of Science and Technology and PFI.⁴⁶ Project NOAH entailed disaster science research and developing technology and information services for weather monitoring. The Project NOAH app, which allows citizens to access real-time weather information, won the Best Community Telecom Project at the Telecom Asia Awards.⁴⁷ Smart Communications redesigned its transmission towers following Typhoon Washi in 2011. In collaboration with the NDRRMC, PFI began training emergency response teams.⁴⁸

Resources

Most partnerships involved mobilising financial donations and providing food, water, emergency supplies and humanitarian aid. Some initiatives involved developing innovative solutions to increase disaster preparedness and resilience, such as Smart Communications' redesign of transmission towers and the Project NOAH app. The app involved research sponsored by the Department of Science and Technology, PFI and Smart Communications.

Achievements

The success of disaster preparedness measures promoted by the Philippine government through the NDRRMC was reflected in the lower death toll due to Typhoon Bopha (in relation to its severity) when compared to Typhoon Washi a year earlier. Actions such as evacuation procedures, the pre-positioning of relief supplies, early warning systems, and improved communications technology also contributed.⁴⁹ Smart Communication's redesigned transmission towers suffered significantly less damage after Typhoon Bopha.⁵⁰ More broadly, the Philippines became better prepared for typhoons in terms of response and improved resilience.

7.8 Thanh Hoa Mangrove Project (Vietnam)

The Thanh Hoa Mangrove Project is a useful illustration of how private insurers can work together with NGOs to drive long-term community-level resilience activities and build local understanding of the value and multiple benefits of ecosystem-based disaster risk reduction.

Type of partnership	Years active	Activities	Achievements
Resource mobilisation /Innovation	5 years (CARE and AXA began co-operating on the project in 2011)	Increasing the resilience of coastal communities in Thanh Hoa province in central/northern Vietnam by reducing the impact of storm surge through mangrove reforestation.	The replanted mangroves provide a buffer zone to protect the lives and livelihoods of coastal communities. More than 85% of vulnerable households have improved their awareness of climate change and disaster risk reduction. The project has also helped foster sustainable agriculture as mangrove restoration led to higher quality soil and seagrass, and to the return of crustaceans.

Natural hazard event

Storm surge risk in Thanh Hoa province, Vietnam. Thanh Hoa had been severely affected by natural hazards, including a major storm surge in 2005, when a storm broke the local seawall and flooded several villages.

⁴⁶ Petron Foundation Inc., 'Petron Joins DOST's Project Noah to Help Mitigate Disasters' (24 October 2012) http://www.petron.com/web/Media/uploads/Media_Release_-_Project_NOAH.pdf.

⁴⁷ The Philippine Star, 'Smart bags international award for Asia's 'best community telecom project' (19 April 2013) <http://www.philstar.com/headlines/2013/04/19/932351/smart-bags-intl-award-asias-best-community-telecom-project>

⁴⁸ Ibid

⁴⁹ Ibid

⁵⁰ Humanitarian Futures Programme, op cit.

Context

In 2011, the AXA Group and CARE France agreed to work together to better equip vulnerable populations to address climate risks. The partnership is part of AXA's Corporate Responsibility Policy under its flagship theme of Risk Research and Education, which seeks to raise awareness of natural disaster prevention by targeting vulnerable communities in emerging economies.

Partners

The AXA Group and CARE. AXA is a Paris-headquartered global insurer. CARE is a leading non-political and non-sectarian aid organisation, with one of the largest humanitarian global networks.

Activities

The EUR 300,000 project, funded by AXA and managed by CARE, focused on increasing the resilience of coastal communities in Thanh Hoa province in central/northern Vietnam through improved preparedness planning and disaster risk reduction measures. The project focused on reducing the impact of storm surge on coastal communities, such as Hau Loc, through mangrove reforestation. CARE worked with the 11,000-member local community to plant 277 hectares of mangrove forest in Da Loc and 181 hectares in Nga Thuy to strengthen their resilience.⁵¹ In order to prepare for mangrove planting, the project team and Da Loc and Nga Thuy authorities conducted a land survey for planting mangroves and setting up nursery garden areas.⁵² The project also oversaw the creation of a group of young ecologists—'The Green Team'—aged 13 to 18, whose role is to spread the message of prevention of disasters and protection of the environment.

CARE also supported a core group of local facilitators in Da Loc and Nga Thuy to receive training on disaster risk reduction. Participants undertook vulnerability and capacity assessments, developed seasonal hazard calendars, identified vulnerable groups and households, and mapped safety areas. Trained facilitators worked with local villagers to prepare disaster risk reduction plans. Some 28 villages in Da Loc, Nga Thuy, and neighbouring Nga Tan commune collectively prepared disaster risk reduction plans, which were aggregated and integrated into plans at the commune and district levels.⁵³

Achievements

The project was successful due to its well-targeted approach and the ability of CARE to generate the broad support of the local population. The replanted mangroves now provide a vital buffer zone to protect the lives and livelihoods of coastal people in the project areas. At a survival rate of 70%-90%, the mangroves have flourished compared to earlier projects in the same area. Furthermore, over 85% of vulnerable households have improved their awareness of disaster risk reduction, including the role of mangroves, and a code of conduct for community-based mangrove management has been established.⁵⁴ The project has also helped foster sustainable agriculture as mangrove restoration led to higher quality soil and seagrass, and to the return of crustaceans.

⁵¹ CARE International, 'Building Coastal Resilience in Vietnam: An integrated, community-based approach to mangrove management, disaster risk reduction, and climate change adaptation', Experiences from CARE in Da Loc and Nga Thuy Communes, Thanh Hoa Province, 2006-2014

⁵² CARE France, 'Disaster Resilient Coastal Communities in Hau Loc and Nga Son District, Thanh Hoa Province', Project Report, September 2014

⁵³ CARE International, 'Building Coastal Resilience in Vietnam: An integrated, community-based approach to mangrove management, disaster risk reduction, and climate change adaptation', Experiences from CARE in Da Loc and Nga Thuy Communes, Thanh Hoa Province, 2006-2014

⁵⁴ CARE International, 'The Mighty Mangrove: Disaster Resilient Coastal Communities in Hau Loc and Nga Son Districts, Thanh Hoa Province, 2014

8. Disaster risk transfer solutions

This section of the report shows how insurers are contributing to disaster resilience through financial risk transfer solutions spanning the individual, national and international levels, including the use of insurance loss data. It shows that insurers are contributing to other activities along the disaster risk management continuum—in this case, disaster risk financing. This section highlights how insurers are innovating and working together with governments and other key stakeholders to absorb financial shocks stemming from natural hazards, as well as to contribute to climate and disaster-resilient development planning through the use of insurance loss data. It underscores the importance of closing the insurance protection gap around the world (i.e. the financial gap between economic losses and insured losses) as an integral component of disaster risk management. According to Swiss Re, the overall insurance protection gap in 2014 amounted to USD 75 billion.

8.1 African Risk Capacity (ARC)

The African Union's (AU) ARC is a ground-breaking risk management and resilience-building platform that provides AU Member States with the financial tools and infrastructure they need to manage natural disaster risk and adapt to climate change.

Led by its African members, ARC brings together four critical elements to create a powerful value proposition for its participants and their partners:

- Early warning
- Contingency planning
- Climate risk insurance
- Climate adaptation finance

ARC's comprehensive package provides governments with access to immediate funds for early and planned responses to support vulnerable populations in the event of weather shocks.

Natural disasters particularly detract from economic growth in low-income countries, where the cost of natural disasters is higher, as a percentage of GDP, than it is in more developed economies. It is estimated that low-income countries could suffer an average decline of more than 5% in per capita income as a result of a catastrophic natural disaster.⁵⁵ Such events diminish economic growth, cause major budget dislocation, erode development gains and resilience, and require additional emergency aid from the international community in the future. Because such natural disasters do not happen in the same year in all parts of Africa, pan-African solidarity in the creation of a disaster risk pool like ARC is financially efficient.

In the case of drought, the impact is most acutely felt at the household level. It has been shown that response is most effective early, before households begin decreasing food intake to cope, selling livestock, or leaving their land, enhancing resilience to economic losses. As a result of reduced response times and risk pooling, a dollar spent on drought response through ARC saves USD 4.40 in traditional humanitarian assistance costs.⁵⁶

For many ARC Member States, a shock in terms of a rainfall deficit or flood inundation can precipitate a call for a major humanitarian intervention and emergency response. The resilience in such countries is significantly low such that many Member States struggle through most years, let alone during a natural disaster. For example, in a country such as Niger, the ARC team has calculated that to withstand a 1-in-5

⁵⁵ Standard and Poor's Financial Services LLC, Storm Alert: Natural Disasters Can Damage Sovereign Creditworthiness

⁵⁶ Based on cost benefit analysis for drought only, see <http://www.africanriskcapacity.org/issues/food-security-and-risk-management>

year drought event, the income of the most vulnerable households would have to grow by an annual average of 3.4% over the next five years in real terms to build sufficient resilience to adequately cope without requiring external assistance. A 1-in-10 year drought event would have an estimated adverse impact of 4% on the annual GDP of Malawi, with even larger impacts for 1-in-15 and 1-in-25 year events.

ARC provides AU Member States with the tools they need to quantify and manage natural disaster risk. ARC's early warning and risk modelling software platform *Africa RiskView* acts as the basis for parametric insurance tools with contractually specified, pre-defined 'hard' triggers offered through ARC's financial affiliate. These early funds, linked to pre-defined national contingency plans, are key to improving the efficiency of disaster response and to building the capacity of countries to lead their own responses and reduce their reliance on the international appeals process for assistance.

African Risk Capacity: A scalable African solution

The African Risk Capacity Specialised Agency of the African Union provides African sovereigns with capacity building services for early warning, contingency planning and risk finance. The Agency established its first financial affiliate, ARC Insurance Company Limited (ARC Ltd), in late 2013. Operating on mutual insurance principles, ARC Ltd issues parametric weather insurance policies to governments. It uses ARC's *Africa RiskView* (ARV) platform to estimate the impact of weather events on vulnerable populations – and the response costs required to assist them – before a hazard season begins, and as it progresses. In the case of drought, index-based insurance payouts, based on ARV, are triggered at or before harvest time if the rains are poor, or as soon as a severe flood or cyclone has occurred. By allowing ARC Member States to capitalise on the natural diversification of weather risk across the continent and access the international markets as a single pool, ARC Ltd reduces transaction costs and premiums to the lowest level possible while remaining financially sustainable.

This early financing immediately following a weather shock is key to improving the efficiency of disaster response, transferring the burden of climate risk away from governments—and the vulnerable populations they protect—to the ARC, which can handle that risk much better including accessing private sector finance.

African Risk Capacity in action

With an initial USD 90 million of a USD 200 million commitment⁵⁷ of returnable capital provided by the governments of Germany (on behalf of BMZ through KfW Development Bank) and the United Kingdom (through DFID), ARC Ltd issued drought insurance policies totalling nearly USD 130 million in coverage for a total premium cost of USD 17 million to a first group of African governments—Kenya, Mauritania, Niger and Senegal—in May 2014, marking the launch of the inaugural ARC pool. In January 2015 ARC Ltd made its first insurance payouts of just over USD 26 million to Mauritania, Niger and Senegal as a result of drought conditions in these countries in 2014. The timely funds provided to these Member States enabled them to implement an early response programme to their affected communities, ahead of any humanitarian aid, spearheading efforts to help countries move from managing crises to addressing risks in a timely manner. Five additional countries joined the pool in May 2015, increasing the drought coverage to over USD 190 million for the 2015/16 rainfall seasons.

8.2 CCRIF SPC (formerly the Caribbean Catastrophe Risk Insurance Facility)

CCRIF is the world's first multi-country risk pool and insurance instrument to successfully develop parametric policies backed by both traditional and capital markets. CCRIF has taken a lead role in demonstrating how regional solutions can be developed to limit the financial impact of natural disasters on national governments.

⁵⁷ DFID have committed a total of GBP 100 million and KfW EUR 50 million to ARC. An additional commitment is anticipated from KfW towards ARC Ltd total returnable capital needs of \$270 million to 2020

CCRIF is a not-for-profit risk pooling facility, owned, operated and registered in the Caribbean for Caribbean and Central American governments. CCRIF offers earthquake, tropical cyclone and excess rainfall coverage to Caribbean as well as Central American governments.⁵⁸

CCRIF was established in 2007 under the technical leadership of the World Bank and with a grant from the Government of Japan. It was capitalized through contributions to a multi-donor trust fund by the European Union, the World Bank, the governments of Canada, the UK, France, Ireland and Bermuda, the Caribbean Development Bank, and membership fees paid by participating countries.⁵⁹ Sixteen Caribbean governments are currently members of the facility: Anguilla, Antigua & Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago, and Turks & Caicos Islands. Nicaragua is the first Central American government to become a CCRIF member.⁶⁰

CCRIF was designed as a regional catastrophe fund for Caribbean governments to limit the financial impact of earthquakes and tropical cyclones through the provision of financial liquidity when a policy is triggered. In 2013, CCRIF added coverage for excess rainfall. CCRIF's mission is to assist member governments and their communities in understanding and reducing the socio-economic and environmental impacts of natural catastrophes. CCRIF seeks to achieve this by being a global exemplar in providing immediate liquidity through a range of affordable insurance products, developing innovative and dynamic tools and services, engaging in effective partnerships, and operating in a way that is financially sustainable and responsive to the needs of its members.

Since its inception, CCRIF has made 13 payouts for hurricanes, earthquakes and excess rainfall to eight member governments totalling approximately USD 38 million. These payouts include among others USD 8.56 million to Barbados following Tropical Cyclone Tomas (October 2010), USD 7.7 million to Haiti following the January 2010 earthquake, and USD 6.3 million to the Turks and Caicos Islands following Tropical Cyclone Ike. All payouts were transferred to the respective governments within 14 days (and in some cases within a week) after the event. CCRIF helps to mitigate the short-term cash flow problems small developing economies suffer after major natural disasters. CCRIF's parametric insurance mechanism allows it to provide rapid payouts to help members finance their initial disaster response and maintain basic government functions after a catastrophic event.

In 2014, CCRIF was restructured into a segregated portfolio company (SPC) and is now called CCRIF SPC, to facilitate the offering of new products (such as the excess rainfall product which was introduced in 2013) and expansion into new geographic areas. The new structure, in which products are offered through a number of segregated portfolios, allows for total segregation of risk. By establishing segregated portfolios, the cross-subsidization of risk is prevented from one region to another, ensuring that each region's risk is based on the particular risk profiles of the countries in that region.

In April 2015, CCRIF signed a memorandum of understanding with COSEFIN (the Council of Ministers of Finance of Central America, Panama and the Dominican Republic) to enable Central American countries to formally join the Facility.

8.3 Earthquake Commission (New Zealand)

New Zealand's Earthquake Commission (EQC) demonstrates how extending complementary natural disaster insurance to residential home, contents and land ensures a high level of insurance penetration and provides an important platform for post-disaster response. The EQC also shows the value of state-owned organisations funding research and monitoring events.

⁵⁸ See <http://ccrif.org/content/about-us>

⁵⁹ The World Bank, 'Caribbean and Central American countries formalize partnership for catastrophe risk insurance', April 2015

⁶⁰ See <http://ccrif.org/content/about-us>

Established in 1945, EQC is a crown entity that provides natural disaster insurance to New Zealand homeowners. EQC natural disaster insurance cover extends to residential home, contents and (uniquely) land. EQC cover is automatic for holders of a private home insurance policy that includes fire insurance.

EQC covers loss or damage from the following natural hazards: earthquake, natural landslip, volcanic eruption, hydrothermal activity, and tsunami. It also insures residential land (within limits) against storm and flood damage and provides insurance for fire resulting from any of these natural hazards.⁶¹ EQC allows for top-up cover through voluntary private insurance. EQC pays up to a cap, and private insurers pay on losses sustained above that level.⁶²

EQC is funded by a flat levy on all residential dwellings regardless of size or location. This means that because it takes the first loss currently up to NZD 100,000 (excluding goods and services tax), top-up private insurance remains affordable and available even for those on low incomes in higher risk areas. Insurance penetration for natural hazards is very high (in excess of 95%) which minimises the risk exposure to home and property owners. The EQC purchases reinsurance—this is now the principal way it would finance claims payments because the National Disaster Fund was significantly drawn down after the Canterbury earthquakes.

The Canterbury earthquake events tested EQC. As the event included a series of significant aftershocks, there was a reluctance to start rebuilding until the intensity of the aftershock events had abated. During this time, EQC sponsored much of the emergency repair work, as part of a wider government response.

Post-Canterbury, the high level of insurance cover in New Zealand enabled a high rate of repair and rebuilding. In consultation with the government, EQC managed home repairs estimated to cost less than the EQC cap of NZD 100,000. This amounted to EQC being involved in repairing 68,475 homes. EQC also ensured the availability of adequate capital to fund the repair or replacement of around 169,000 homes.

EQC also funds research and provides information about how homes can be made safer from damage caused by natural disasters. EQC's research programme aims to improve knowledge and professional practices to reduce the government's exposure to geological hazard events and make communities more resilient.⁶³ For example, EQC funds research to build understanding and reduce vulnerability to hazards, and sponsors public education to encourage steps to reduce the effects of geological hazards. Other supportive activities include investing in core infrastructure to support research and hazard monitoring.

EQC is also the principal sponsor of GeoNet, New Zealand's 24/7 geological hazard monitoring system.⁶⁴ Data accumulated by GeoNet is managed and analysed to improve the detection and understanding of earthquakes, volcanic unrest, land deformation, land stability, geothermal activity and tsunamis. This information is in turn used by emergency managers, scientific researchers, engineers, lifeline utility groups, planners and the general public (via the website, social media and a smartphone app). GeoNet also provides real-time data-sharing with other major data centres in Australia, the US, Europe and Japan.

The EQC model is currently under review and change is expected though the principle that EQC will provide first loss with top-up cover from private insurers will not change.

⁶¹ See <http://www.eqc.govt.nz/what-we-do/eqc-insurance>

⁶² The Geneva Association: 'Insurers as contributors to problem solving and impact reduction: A Geneva Association Conference Review' (June 2015)

⁶³ Ibid

⁶⁴ GeoNet: the official source of geological hazard information for New Zealand; See <http://www.geonet.org.nz/>

8.4 Effectiveness of Microinsurers' Responses to Typhoon Haiyan (Philippines)

This case study is an abstract of the report, 'Aiding the disaster recovery process: The effectiveness of microinsurance service providers' response to Typhoon Haiyan', published in 2015 by the Microinsurance Network.

On 8 November 2013, Super Typhoon Haiyan hit the Philippines with the highest wind speeds ever seen on land. The typhoon crossed land six times and left a path of destruction that impacted over 16 million people and displaced almost 4.1 million people. In addition to the high winds, the typhoon had an unprecedented storm surge that was the main cause of death for the 6,300 casualties.

The Philippines has the highest microinsurance penetration in the Asia-Pacific, with 19.9 million properties and lives covered, making it a success story. As many of those affected were marginalised populations, microinsurance played a significant role in the recovery process. The microinsurance landscape includes credit insurance, life, accident, calamity and funeral insurance, with life and non-life providers associated with intermediaries in the form of brokers, cooperatives, NGOs and rural banks.

Typically, microinsurance covers low-income communities through organisations that have relationships with them either through membership or regular contact to make loan payments. Therefore, familiarity with clients and the intermediaries being situated within the communities facilitated a tremendous relief effort after the disaster by bringing in relief goods and settling claims.

The Insurance Commission (IC) made adaptations to enable more expedient claims payments:

- Created an industry Claims Action Centre in the hardest hit city of Tacloban
- Relaxed documentation requirements on initial payments for death claims
- Created a master list of all policyholders in the stricken areas

The IC allowed goods to be paid in lieu of cash, and satellite imaging to be used as a tool in claims assessment. The IC was also instrumental in gathering updated information from the industry with regard to relief efforts and claims paid.

As of July 2014, approximately 111,461 microinsurance claims had been paid amounting to PHP 532 million (USD 12 million), with 80% of the number of claims (69% of the total amount) coming from two distribution networks. Calamity claims account for 98% of the number of claims paid and 85% of the total claims payouts, followed by crop insurance. The overall average claims payout was PHP 4,777 (USD 108).⁶⁵

Mass onsite visual assessments were a mechanism used to speed up the claims process. One company used satellite images and crisis mapping to determine households in affected areas and to categorise their level of devastation to help prioritise claims processing, while other providers personally identified flattened areas where there was 100% damage. The intermediaries would find the clients and process claims in batches to submit to the providers. Due to the relaxed documentation requirements from the IC to receive a quick initial payout of 50% of the benefit for life insurance, being on the official casualty list sufficed as opposed to presenting a death certificate (the statutory requirement). Of the eventual total claims paid reported in the study, 27% were paid in the first four and a half weeks after the typhoon. The study team estimated that over 35% of reported microinsurance paid claims as of July 2014 were paid to clients by 31 December 2013 and almost 60% were paid by March 2014. Most reports indicate that the claims processing time was a month or more.⁶⁶

⁶⁵ Finalising the claim payments for Typhoon Haiyan is a massive undertaking and therefore the industry data and analysis presented in this study is based on preliminary data as some companies, as of October 2014, were still processing and settling claims

⁶⁶ CARD MBA indicated they had paid their life claims within their 1-3-5 day target, and MicroEnsure had paid 48% of their total claims by 11 December 2014

Microinsurance did make a difference in the recovery from the typhoon. Funds were spent restarting livelihoods and repairing homes. Microinsurance filled the gap especially in cases where assistance wasn't provided by the government, NGOs or international organisations to repair homes. The disaster increased insurance awareness in communities. Insurers saw geographical gaps in their coverage and products and are actively going into these areas to reach marginalised populations. PCIC, the government crop insurance agency, offered free coverage (including pests and diseases) for 2014 to all registered farmers with under seven hectares of land in the declared regions, whether the farmer was a policyholder or not. The Department of Finance, in partnership with the IC, developed a mandatory insurance product that accompanies a Credit Support Fund for Typhoon Haiyan victims. These are calamity products attached to a loan and all insurers were invited through the Philippine Insurers and Reinsurers Association to participate in this credit support insurance programme.

The study also examined the disaster recovery management (DRM) systems in place and how they performed during and after the typhoon. The following are key lessons:

- Better planning, implementation and training for barangay⁶⁷ DRM is required along with early warning systems that are written and communicated in layman's language
- The private sector, NGOs and aid organisations have been essential to the recovery efforts. However, better coordination of international, national and local government relief and recovery efforts would improve their effectiveness
- Permanent housing solutions are needed including rebuilding in safer areas for the long-term

Recommendations in relation to integrating microinsurance into DRM plans:

- Find effective means to reach out to rural communities and the marginalised in cities to expand calamity insurance offers and to increase the number of people covered
- Create more initiatives that assist with rebuilding homes and explore the development of livelihood insurance products and insurance that is not tied to loans
- Explore industry initiatives for catastrophe insurance to ensure companies can support their risks and also spread the calamity risk over multiple geographical areas to limit the provider's exposure to large losses. As of March 31, 2012, there were 42,027 barangays in the Philippines⁶⁸
- Ensure client understanding of exclusions. The different accident and calamity definitions could cause confusion within the industry and present a potential consumer protection issue. Definitions may have to be reviewed in the post-Haiyan era

Disaster risk financing is an essential part of the National Disaster Risk Reduction and Management Plan of the Philippines. In examining the effectiveness of microinsurance through the experience of Typhoon Haiyan, it was evident that microinsurance did provide assistance after a disaster and could fill a larger role with formal integration into the plan itself.

8.5 Insurance Loss Data Sharing Project for Climate-Resilient Municipalities (Norway)

This innovative public-private partnership on insurance loss data sharing in Norway offers invaluable insights on how insurers, local and national governments, academia and international organisations can collaborate to reduce climate and disaster risk and promote risk-informed development planning.

⁶⁷ A barangay is the smallest administrative unit in the Philippines, below municipalities, cities, provinces and regions

⁶⁸ Philippines Statistic Authority – National Statistical Coordination Board 2012

The Norwegian government's official report, *'Adapting to climate change: Norway's vulnerability and the need to adapt to the impacts of climate change'* recommends establishing 'a database for public use and research using aggregated, anonymised data on climate-related damage from the insurance companies and the Norwegian Natural Perils Pool'.

In Norway, an anticipated adverse effect of climate change is an increase in damage compensation due to floods, storms, storm surges and landslides, including urban flooding due to sewer back flush, surface runoff and storm water. Municipalities have the local responsibility to reduce the risk from such events while insurers pay reconstruction costs. To address the problem of increasing damage compensation, a pilot project to build resilience was conducted to provide a basis for cooperation between municipalities and insurers.

This project, which ran from September 2013 to February 2015, is the first public-private partnership of its kind. It is a collaboration involving Finance Norway (the Norwegian banking and insurance association), insurers, Western Norway Research Institute, the Department of Geography at the Norwegian University of Science and Technology (NTNU), and ten municipalities. The project was funded by Finance Norway and the Ministry of Local Government and Modernisation through the government's Cities of the Future programme.

The project's overall goal was to assess whether having access to disaster loss insurance data could strengthen municipalities' capacity to prevent and reduce climate-related losses. Specific goals were to:

- Develop a method to use disaster loss data from insurers
- Identify possible advantages of having access to disaster loss insurance data
- Determine possible costs of using disaster loss insurance data
- Outline the structure of a future system to use disaster loss insurance data
- Contribute to strengthening the trust between municipalities, state agencies and insurers on matters concerning the prevention and reduction of climate-related losses

The project entailed carrying out trials in a group of municipalities. Finance Norway collected and organised disaster loss data from various insurers. Western Norway Research Institute and NTNU transmitted the data to municipalities and offered advice on how to import and analyse the data. Ten municipalities participated in the project, although one eventually withdrew. Together with Finance Norway and insurers, various government agencies (e.g. local and regional authorities, civil protection, climate, environment, water, energy, meteorological institute) supported this reference group. Each municipality received a subset of insurance loss data representing historical events that had taken place within their respective jurisdictions. The municipalities geocoded the data to make them better suited for spatial planning, especially for land use and water and sanitation. Participating municipalities were interviewed on how they carried out the trial and the usefulness of gaining access to insurance loss data. Their experiences were also presented and discussed in two seminars.

The main conclusion of the project is that municipalities found it beneficial to have access to disaster loss data from insurers as it strengthens their risk management capacity in various ways. Overall, the project provided a basis for better collaboration between municipalities and the insurance industry, a better understanding of risks, and how climate risks affect communities. Outcomes across specific areas include:

Land-use planning

- Better knowledge to help plan new development areas (where exposure to natural hazards is lower) and to prioritise safety measures

Construction and maintenance for water & sanitation

- Better knowledge to help prioritise management, maintenance, rehabilitation and reinvestment
- Basis for better collaboration between municipalities' water & sanitation and planning units

Public infrastructure

- Better knowledge to help prioritise safety measures

Emergency preparedness

- Better knowledge to help risk and vulnerability analyses

The project highlighted that land-use planning is one of the most important tools for municipalities to prevent and reduce disaster risk. Municipalities need to have an overview of natural hazard risks and link this information to existing infrastructure and future development areas. They need to localise and develop physical infrastructure in a way that it does not create or increase disaster risk. Safety measures should also be implemented.

The project recommended that Finance Norway invite municipalities and government authorities concerned to explore arrangements where municipalities are given access to the insurance loss data on a more permanent basis. It identified critical data quality issues that future work needs to address. The project also highlighted that using disaster loss insurance data to document the effects of climate change is particularly important in cases where new data indicates a break with historical trends with regard to natural hazards.

Finally, given the key role of Finance Norway in the project, the Norwegian insurance industry enhanced its cooperation on risk management with other markets and various national and European authorities. For example, the project has led to discussions by Finance Norway with the Danish Insurance Association, which is carrying out a similar insurance loss data sharing initiative with Danish municipalities. Finance Norway is also liaising with the European Commission and the UN Office for Disaster Risk Reduction on integrated disaster risk management. This includes the implementation of the Sendai Framework for Disaster Risk Reduction, which was produced by the 3rd UN World Conference on Disaster Risk Reduction held in March 2015.

8.6 Japan's Earthquake Insurance System for Homeowners

Japan's earthquake insurance system for homeowners—backed by the Japan Earthquake Reinsurance (JER) Company—provides a highly efficient and streamlined response to policyholders. It ensures sufficient liquidity and protects insurers against extreme losses.

The 1923 Great Kanto earthquake almost bankrupted the Japanese insurance industry. When the Niigata earthquake struck Japan in 1964, there was no earthquake insurance available. In Japan, earthquakes had long been considered uninsurable because of the difficulty of applying the law of large numbers, the overwhelming scale of economic consequences they generate, and the concern on adverse selection. This is a situation where the system becomes unsustainable due to the high concentration of risks in seismically-active zones. The 1964 Niigata earthquake drove the government and the insurance industry to work together to address this challenge, prompting the government to create a public-private partnership to contain economic losses due to large-scale earthquakes.⁶⁹ The ensuing Earthquake Insurance Act of 1966 led to the creation of the Japan Earthquake Pool, and the start of earthquake insurance for homeowners.

The devastating earthquake that struck the port city of Kobe in January 1995 led to further discussion on the homeowners' earthquake insurance system, which had already substantially increased coverage limits for both property/buildings and contents.⁷⁰ The disaster revealed that the public was not well-informed about the insurance scheme, which had a low penetration rate of 9%. This prompted the

⁶⁹ The Geneva Association 'Insurance as contributors to problem solving and impact reduction: a Geneva Association conference review' (June 2015)

⁷⁰ Ibid

insurance industry and the General Insurance Association of Japan to better publicise the system. Furthermore, earthquake insurance premium became subject to income tax deduction from fiscal year 2006.

The earthquake insurance system covers losses to property and contents due to earthquake, tsunami and volcanic eruption. The cover is offered as a rider to standard homeowner policies, and the distribution method reduces adverse selection and solicitation costs. It offers between 30%-50% of the insured property value, with the limit for property capped at USD 500,000 and contents at USD 100,000. Under the system, rates for policies are based on a 'no loss and no profit' principle, a measure governed by the General Insurance Rating Organisation of Japan (GIRO).⁷¹ Despite this principle, insurers find enormous value in selling the coverage since it solidifies their relationships with their customers.⁷²

Premiums are pooled and managed by the Japan Earthquake Reinsurance (JER) Company—a special purpose reinsurance company managed by leading Japanese non-life insurance companies. Each private insurer reinsures (i.e. insurance of an insurer) 100% of the written risk to JER. The risk is then shared further by way of retrocession (i.e. reinsurance of a reinsurer), with JER retaining a portion of the risk and retroceding some of that risk to insurers and the government. The JER is mandated to manage the risk reserves of each insurer, in addition to managing its own fund. This facilitates a transparent process in the event of a loss, and protects the insurer's bottom line. The government also keeps a fund under a special account, which is set aside from the ordinary fiscal budget.⁷³

This system has a number of advantages. If an earthquake occurs and looks likely to affect the government reinsurance layer, GIRO is called in to estimate the loss. Based on GIRO's independent judgement, the JER requests approximate payment from the government and, with discrete funding in place, there is no risk of a liquidity crunch. With the Japanese government acting as a reinsurer, insurers are protected against extreme losses that might arise. The system's simplicity is also an advantage. The system has a unique procedure whereby losses are categorised into three different segments: total loss, half loss and partial loss, where the amount payable is 100%, 50% and 5% respectively of the insured property value for each of these categories.⁷⁴

The homeowners' earthquake insurance system played a critical role in the post-disaster relief and recovery process with respect to the Sendai earthquake and tsunami in March 2011, which killed 15,880 people and resulted in total economic losses of approximately USD 210 billion. Total insured losses, estimated at USD 35.7 billion, is the second-highest figure in history, next only to the insured losses in the US due to Hurricane Katrina.⁷⁵ Clear designation of total loss areas meant that there was no need to inspect individual properties, which sped up the claims process. Furthermore, a streamlined assessment standard adopted by the insurance industry led to quick adjustments and claims settlements. Finally, insurers were able to mobilise their manpower quickly and effectively. More than 90% of reported claims were settled within 90 days of occurrence, and it is likely that insurance payments reached recipients quicker than any other form of financial relief. Despite this extreme loss, the system kept insurers financially sound. It is also worth noting that at the time of the 2011 Sendai events, national insurance penetration stood at 23.7%, and 33.6% in the hardest-hit Miyagi prefecture.⁷⁶

The effective response of Japan's earthquake insurance system to the 2011 Sendai events provide valuable lessons on risk-sharing systems and public-private partnerships that can be mirrored in other high-risk areas across the globe.

⁷¹ The Geneva Association: 'Lessons Learned from the Events of March 2011: A Geneva Association conference review' (November 2013)

⁷² The Geneva Association, The Geneva Reports 'Risk and Insurance Research: Insurers' contributions to disaster reduction—a series of case studies' (No. 7 May 2013)

⁷³ Ibid

⁷⁴ Ibid

⁷⁵ Ibid

⁷⁶ Ibid

8.7 Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)

PCRAFI reduces the financial vulnerability of constituent Pacific Island Countries (PICs) to natural hazards. It also provides access to important hazard models, which enable PICs to better prepare for natural hazards.

The cost of damage and loss suffered in PICs as a result of recent natural disasters ranges from 1.5% to 27% of GDP.⁷⁷ Recent IMF analysis shows that a natural disaster that affects 1% of the population in PICs causes a drop in real revenue of 0.4 percentage point; double that in other small states.⁷⁸ Findings from recent post-disaster needs assessments (PDNAs) demonstrate how sensitive small island economies can be to natural disasters—the estimated recovery and reconstruction plans outlined in the PDNAs are about as costly as the total damage and loss incurred.

PICs face significant challenges in their preparedness for natural hazards. Their financing and post-disaster liquidity options are restricted on account of their small size, limited borrowing capacity, and poor access to international insurance markets. The small size of PICs also limits the geographic diversification of risk; subsidising affected regions using revenues from unaffected regions is nearly impossible. Moreover, high transaction costs, the inability to spread risk over a large territory, and the relatively small size of the local economies has resulted in low insurance penetration. PICs' narrow revenue base, status as net importers, and reliance on aid as an income stream also limit available options for post-disaster finance.⁷⁹

PCRAFI provides 15 PICs with disaster risk assessment tools to help them better assess their exposure to natural disasters. PCRAFI is a joint initiative of the Pacific Islands Applied Geoscience Commission (SOPAC)/Secretariat of the Pacific Community (SPC), the World Bank, and the Asian Development Bank. The organisation also receives financial support from the Japanese government, the Global Facility for Disaster Reduction and Recovery (GFDRR) and the ACP-EU Natural Disaster Risk Reduction Programme, as well as technical support from AIR Worldwide, New Zealand GNS Science, Geoscience Australia, Pacific Disaster Center (PDC), OpenGeo and GFDRR Labs. PCRAFI also engages PIC governments on integrated financial solutions to reduce their financial vulnerability to natural disasters and climate change.

The PCRAFI has developed the largest collection of geo-referenced data for hazard modelling in the region covering: satellite imagery; topographic maps; bathymetry maps; surface geology maps; surface soil maps; land cover/land use maps; geodetic and fault data; and historical catalogues of tropical cyclones and earthquakes. PCRAFI has also produced detailed probabilistic hazard models for all 15 PICs covering: tropical cyclones; storm surge; earthquake; and tsunamis.

The Pacific Catastrophe Risk Insurance Pilot, modelled on the CCRIF, provides an off-budget injection of liquidity following eligible natural peril events. This insurance facility is designed to cover emergency losses, which are estimated using PCRAFI models, based on hazard parameters and a calculation of total modelled physical damage. Unlike conventional insurance schemes, where a payout would be assessed against actual incurred costs, this facility (similar to the African Risk Capacity) pays out on the results of a model. The payout acts as a form of budget support and goes some of the way to cover the costs incurred by the government in the aftermath of a severe natural disaster. Member countries have the option of choosing between three layers of coverage: low; medium; and high, depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years—that is, more frequent but less severe events. The medium layer covers events with a 1-in-15-year return period, while the higher layer covers less frequent but more severe events, or those with a return period of 1-in-20 years. However, countries may also request that a more customised option be developed for them.

⁷⁷ PCRAFI: 'Advancing Disaster Risk Financing & Insurance in the Pacific: Regional summary note and options for consideration' (February 2015)

⁷⁸ IMF, 'Enhancing Macroeconomic Resilience to Natural Disasters and Climate Change in the Small States of the Pacific', IMF Working Paper 15/121.

⁷⁹ Ibid

Following Cyclone Pam in March 2015, which led to one of the worst natural disasters in Vanuatu's history, the programme ensured a rapid injection of USD 1.9 million in funds within 10 days to enable the Vanuatu government to address immediate needs. In 2014, Tonga was the first country to benefit from a payout under the Pacific Catastrophe Risk Insurance Pilot, with an immediate payment of USD 1.5 million in cash.

8.8 R4 Rural Resilience Initiative (Africa)

The R4 Rural Resilience Initiative (R4) demonstrates how risk reduction strategies and microinsurance schemes can be developed and implemented to meet the particular challenges of poor farming communities in Africa.

R4 is a comprehensive risk management approach to help poor farming communities in Senegal and Ethiopia become more resilient to climate variability and shocks and related natural hazards. R4 was launched in 2011 by Oxfam America and the World Food Programme (WFP) with the support of Swiss Re. R4 refers to the four risk management strategies that the initiative integrates, namely: improved resource management (risk reduction), insurance (risk transfer), microcredit (prudent risk-taking), and savings (risk reserves). R4 builds on the initial success of the Horn of Africa Risk Transfer for Adaptation (HARITA) initiative which gave poor farmers and rural households the option to pay for insurance by contributing their time and labour to climate adaptation measures, such as crop irrigation and forestry projects.

Under the R4 programme, farmers pay for insurance premiums through labour, in coordination with the government's work programme, in the same way that one would purchase an insurance product commercially. The labour performed involves activities that reduce climate risk. Through participatory capacity and vulnerability assessments, R4 farmers identify critical risk reduction activities needed for their community, such as small-scale water harvesting, increased soil moisture retention through improved agronomic practices, and other agricultural methods to improve crop production. Having identified the risk reduction strategies that can be undertaken, farmers can then purchase weather-index insurance from local insurers to address their risks that cannot be sufficiently reduced.

Governments and international development assistance help finance the 'insurance-for-work' option. The expectation, however, is that after a few years, people will be able to cover the premium cost themselves. By allowing vulnerable farmers to pay their premiums through risk-reducing labour, farmers benefit even when there is no payout—the risk reduction measures undertaken in their communities pay dividends, even during the wet years.⁸⁰

Swiss Re supports R4 as both a founding sponsor and exclusive technical advisor on insurance and reinsurance. Over recent years, Swiss Re has been investing in the development of innovative microinsurance schemes, such as weather and yield index insurance products, to manage systemic risks. The company's knowledge of climate-related risk and agricultural insurance solutions plays a vital role in increasing risk transfer capacity across Africa and other parts of the developing world.

R4 thus brings together the public and private sectors in a strategic, large-scale initiative to innovate and develop better tools to help the most vulnerable people build resilience. R4 also extends the risk management benefits of financial services, such as insurance and credit, to vulnerable populations. Moreover, R4 shows how creative approaches to risk management can be both effective and affordable.

⁸⁰ The Geneva Association: The Geneva Reports 'Risk and Insurance Research: Insurers' contributions to disaster reduction—a series of case studies' (No. 7, May 2013)

9. Conclusion

Increasing disaster risk due to rapid urbanisation, poor land-use planning and management, unenforced building codes, lack of disaster preparedness, degraded ecosystems, climate change and other risk factors is a clear sign of unsustainable development pathways.

Disaster resilience entails everyone being risk aware, and making risk-informed choices and decisions. At the heart of the resilience challenge is collaboration. This report has shown how effective multi-stakeholder partnerships can build disaster resilience at all levels of society—from districts, municipalities and cities, to countries and regions. Together with the earlier outputs of the PSI Global Resilience Project, this report has also shown that there is a significant disaster risk reduction gap—there is insufficient understanding and action to prevent and reduce disaster risk. It has highlighted the need for insurers, governments, businesses, NGOs and communities to work collaboratively in closing this disaster risk reduction gap, in addition to closing the insurance protection gap around the world—the financial gap between economic losses and insured losses.

Furthermore, disaster risk reduction initiatives are usually not designed to link risk transfer solutions such as insurance, and vice-versa. This is a missed opportunity to adopt integrated disaster risk management. Understanding the links between disaster risk reduction and insurance solutions is crucial to achieving greater disaster resilience. Increasing disaster risk will increase the cost of insurance and can ultimately make insurance unaffordable. This could lead to government becoming the insurer of last resort. Conversely, by reducing disaster risk, insurance solutions become more viable, affordable, accessible and scalable.

Closing both the disaster risk reduction gap and the insurance protection gap is imperative to protecting hard-won development gains and to shaping disaster-resilient development pathways. In this context, UN global policy frameworks on sustainable development culminating this year—from the UN Sustainable Development Goals, to the Sendai Framework for Disaster Risk Reduction and the expected universal agreement on climate change—all offer an unprecedented opportunity for collaboration. These global frameworks are opportunities for the insurance industry to work together with governments and other key stakeholders in building disaster resilience, and in promoting economic, social and environmental sustainability.

It is our hope that more insurers around the world will heed this call to action and step up to the role they need to play to help build a risk-aware, resilient and sustainable society.

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PSI Principles for Sustainable Insurance

The UNEP FI Principles for Sustainable Insurance Initiative (PSI Initiative)

'The Principles for Sustainable Insurance provide a global roadmap to develop and expand the innovative risk management and insurance solutions that we need to promote renewable energy, clean water, food security, sustainable cities and disaster-resilient communities.'

Ban Ki-moon, UN Secretary-General

Launched at the 2012 UN Conference on Sustainable Development, the UNEP FI Principles for Sustainable Insurance serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities.

Endorsed by the UN Secretary-General and insurance CEOs, the Principles have led to the largest collaborative initiative between the UN and the insurance industry — the PSI Initiative. As of November 2015, nearly 90 organisations have adopted the Principles, including insurers representing approximately 20% of world premium volume and USD 14 trillion in assets under management. The Principles are part of the insurance industry criteria of the Dow Jones Sustainability Indices, FTSE4Good, and Brazil's BM&FBOVESPA Corporate Sustainability Index.

The vision of the PSI Initiative is of a risk aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society. Its purpose is to better understand, prevent and reduce environmental, social and governance risks, and better manage opportunities to provide quality and reliable risk protection.

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