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The role of insurance supervisors in climate risk insurance

Making the vulnerable more resilient to natural disasters

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with support of
Hui Lin Chiew and
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List of Abbreviations

A2ii	Access to Insurance Initiative
ADB	Asian Development Bank
AfDB	African Development Bank
AICI	Agricultural Insurance Company of India
ARC	African Risk Capacity
BIA	Bangladesh Insurance Academy
BICSA	Bundled Solutions of Index Insurance with Climate Information and Seed Systems to manage Agricultural Risks
ASSAL	Asociación de Supervisores de Seguros de América Latina (Association of Latin American Supervisors)
CBO	Community Based Organisations
CIMA	Conférence Interafricane des Marchés d'Assurance (Inter-African Confederation of Insurance Markets)
CNAAS	Compagnie Nationale d'Assurance Agricole du Sénégal (National Agriculture Insurance Company of Senegal)
CCRIF	Caribbean Catastrophe Risk Insurance Facility
COAST	Caribbean Oceans and Aquaculture Sustainability Facility
CSR	Corporate Social Responsibility
CRI	Climate Risk Insurance
DRI	Disaster Risk Insurance
DRF	Disaster Risk Financing
DRR	Disaster Risk Reduction
GAR	United Nations Global Assessment Report on Disaster Risk Reduction Gross
GDP	Domestic Product
GFDRR	Global Facility for Disaster Risk Reduction
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
FCA	Financial Conduct Authority - UK
FSEC	Fund for Natural and Man-made disasters of Morocco
IAIS	International Association of Insurance Supervisors
IC	Insurance Commission of the Philippines
ICMIF	International Cooperative and Mutual Insurance Federation
ICRM	Integrated Climate Risk Management Approach
KYC	Know Your Costumer
LARG	Latin American Reinsurance Group
MBAs	Mutual Benefit Associations
MCII	Munich Climate Insurance Initiative
MEFIN	Mutual Exchange Forum on Inclusive Insurance
MFIs	Microfinance Institutions
MiN	Microinsurance Network
MNOs	Mobile Network Operators
MSME	Micro, small and medium sized enterprise
NGO	Non-Governmental Organisation
PCAFRI	Pacific Catastrophe Risk Assessment and Financing Initiative
PCDIP	Philippines City Disaster Insurance Pool
PCIC	Philippines Crop Insurance Corporation
PMFBY	Pradhan Mantri Fasal Bima Yojana

PPP	Public Private Partnerships
RAISAX	Registry of Foreign Insurers and Intermediaries of the Agricultural Insurance in Colombia
RMS	Risk Management Solutions
SDGs	Sustainable Development Goals
SFC	Superintendencia Financiera de Colombia (Colombian Financial Supervisor)
SMEs	Small and Medium Enterprise
TCFD	Task Force on Climate-related Financial Disclosures
TCIP	Turkish Catastrophe Insurance Pool
UK	United Kingdom
UN	United Nations
UNISDR	United Nations Office for Disaster Risk Reduction
USD	United States Dollar
VAT	Value Added Tax
WB	World Bank
WFP	World Food Programme

Glossary

Build back better – The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment.

Climate change – A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.

Climate change adaptation – Adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects that moderate harm and exploit beneficial opportunities. This can include: (a) adapting development to gradual changes in average temperature, sea level and precipitation; and (b) reducing and managing the risks associated with more frequent, severe and unpredictable extreme weather events.

Climate risk – Natural disasters that affect vulnerable households, entrepreneurs, smallholder farmers, whether amplified or not by climate change.

Climate risk insurance – An insurance solution at the macro, meso and micro-level that aims to provide coverage against climate risks.

Disaster resilience – Disaster resilience is the ability of individuals, communities, organisations and states to adapt to and recover from hazards, shocks or stresses without compromising long-term prospects for development.

Disaster risk financing – Discipline that addresses the fiscal impacts and economic losses caused by natural hazards and supports countries to increase their financial resilience to natural disasters.

Disaster risk reduction – The concept and practice of reducing disaster risks through analysis and management of their causal factors. It reduces exposure to hazards, lessens the vulnerability of people and assets, improves management of the land and environment and preparedness for adverse events.

Index-based insurance – A form of insurance where payments to the beneficiary are triggered by a pre-agreed index (which should be objective and independent) and, once triggered, the amount of the payment is determined by the value of the pre-agreed index.

Insurance protection gap – The difference between the amount of insurance that is economically beneficial and the amount of coverage actually purchased.

Natural disasters – Exposure and vulnerability are the factors that make natural hazards become a natural disaster

Natural hazards – Natural hazards can be weather-related hazards, such as extreme temperatures, rainfall, wind speed, and storm surges, or such geophysical hazards as seismic activity and volcanic eruptions

Resilience – Being more resilient means suffering less overall damage from an adverse event, whether as a result of avoiding it, reducing its impact or enhancing recovery.

INTRODUCTION

Begum is a single mother with four children who lives in Kurigram, one of the poorest and most flood-exposed districts in Bangladesh. She does not carry out a specific productive activity, she has to do what she can to provide for her family. Almost every year, Begum has to sell her chickens and ducks at the lowest price in the market, in order to make enough income to afford the bamboo that she needs to reinforce her home against the next floods. She also puts aside some of the income as savings for survival during the flooding, as she will not be able to carry out her business activities as usual. During the flooding, Begum has to skip meals and defend her home from burglars. Her children cannot go to school and the family has to find shelter. When the flood has finally receded, she has to find resources to repair and rebuild her life. Begum's story is the story of millions of people around the world. Due to climate change, their situations will only become more precarious; and more and more people in the world will have to face Begum's situation.

Insurers can help build resilience of people like Begum. As risk underwriters, they can do so through three pathways: the first and foremost by offering risk transfer solutions in the form of appropriate insurance products. However, insurance cover is just one facet of risk management. Insurers can offer products and services that not merely transfer risk, but also encourage consumers to adopt more comprehensive risk management measures such as risk prevention, mitigation and reduction, in order to avoid or reduce losses. By lending their expertise as risk experts to initiatives and stakeholders beyond the insurance industry, insurers can help societies to better understand risks.

Yet, how and whether insurers contribute to climate risk solutions largely depends on the regulatory and supervisory environment. With this in mind, this paper aims to explore what insurance supervisors can do in order to reduce the insurance protection gap and tap on the wider role of the insurance industry, so that Begum and other small and micro-entrepreneurs, smallholder farmers and other vulnerable people can be protected directly or indirectly through insurance and sound climate risk management solutions.

Why should insurance supervisors take an active role in building resilience against climate risks? Insurance supervisors are instrumental to unlock responsible insurance market development and therefore have a key role to play. At the core, insurance supervisors have a mandate to ensure the financial stability of the insurance sector and protect consumers. This is founded on the recognition that insurance is a key instrument to manage risks and therefore a safe and sound insurance market should be guaranteed for the benefit of society. In recent years, insurance supervisors have been expanding their roles to also include promoting access to insurance and market development.

Furthermore, insurance supervisors are in a well-placed position to influence national-level strategies to managing climate risk. They can raise awareness amongst policymakers on how climate risk insurance can be instrumental to achieve high-level policy priorities such as rural development, food security, disaster risk reduction, climate change adaptation, financial inclusion and small and micro-enterprise development, amongst others. Insurance supervisors, in their unique position as a bridge between policymakers, the insurance industry and consumers, are best-placed to navigate these contexts, both in terms of aligning the interests of the different sectors as well as lending policy and technical expertise.

Various international agreements have set out goals that are key towards Disaster Risk Reduction (DRR), Climate Change Adaptation (CCA) and more broadly the Sustainable Development Goals of the 2030 Agenda for Sustainable Development. Indeed, all of these international agreements have emphasised that achieving outcomes towards these goals depends largely on the ability to engage in a meaningful way with a wide range of partners.

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The Sendai Framework for Disaster Risk Reduction 2015-2030, an international agreement signed by 187 United Nations (UN) member states that aims to reduce disaster risk, recognises that Member States have the overall responsibility for reducing disaster risk, but this responsibility is shared between other relevant stakeholders. Specifically paragraph 36 (c) provides that [Member] States should encourage "(…) financial regulators and accounting bodies, (…), to integrate disaster risk management, including business continuity, into business models and practices through disaster-risk-informed investments, especially in micro, small and medium-sized enterprises; engage in awareness-raising and training for their employees and customers; engage in and support research and innovation, as well as technological development for disaster risk management; share and disseminate knowledge, practices and non-sensitive data; and actively participate, as appropriate and under the guidance of the public sector, in the development of normative frameworks and technical standards that incorporate disaster risk management"[1].

Considering the above, insurance supervisors have both good reason and the means to take active steps to promote resilience against climate risks and natural disasters, particularly amongst the low-income and underserved population. This is from the perspectives of carrying their mandates as local regulators, as well as stakeholders in achieving international goals relating to DRR, CCA and the SDGs. The topic of supervisory roles in this regard is not yet explored at depth. Therefore, this paper aims to contribute to the discourse by sharing ideas and stimulating discussions as to what the roles of supervisors can be.

In this paper, the term "climate risk" will encompass natural disasters that affect vulnerable households, entrepreneurs, smallholder farmers, whether amplified or not by climate change. This concept is closer to the term "physical climate risk" which is a component of the more comprehensive concept of climate risk introduced by Mark Carney, Governor of the Bank of England, where climate risk is composed of physical risks, liability risks and transition risks. Considering the above, climate risk insurance (CRI) in this paper is defined as any risk transfer solution at the macro, meso and micro-level that aims to provide coverage against climate risks. **Box 1** provides some clarifications in this respect.

1 (UN, 2015)

lives and property of farming families, and covers loss of income after floods, excessive rain, drought and low temperatures[4].

2. **Meso-level solutions:** These solutions aim to directly protect organisations that provide key services to vulnerable communities, households, farmers, such as MFIs, cooperatives, credit unions, NGOs and humanitarian organisations. The individuals that use the services provided by these entities indirectly benefit from the insurance coverage. The organisation is both the policyholder and beneficiary. Examples of meso solutions are products that protect MFIs. In many communities, MFIs are the first entities that individuals turn to for post-disaster recovery loans. They also see their balance sheets affected in the aftermath of a disaster due to mass defaults, infrastructure damage, or service disruption. Generally, MFIs manage these risks by either not offering loans in exposed areas during certain periods of the year, or by adopting ex-post measures such as rescheduling, refinancing or writing off loans. Insurance could help MFIs to better manage their risk, leading to better financial performance, lower interest rates, and most importantly, more stable access to credit for impacted communities when they need them the most. Other examples are products that aim to protect humanitarian organisations by ensuring that they have the capital required in the aftermath of a disaster.

3. **Micro-level solutions:** These insurance solutions aim to directly protect the low-income and underserved population against financial losses caused by natural disasters that could be direct or indirect. They are either the policyholder of an individual policy, or the insured and beneficiary of a group policy. The premium could be paid by themselves or through subsidies offered by a wide range of institutions. Examples of these products are agriculture insurance products such as the India's crop insurance scheme, Pradhan Mantri Fasal Bima Yojana (PMFBY), that covers approximately 40 million farmers against natural calamities, pests and diseases, and the R4 Initiative of the World Food Programme (WFP) in Sub-Saharan Africa covers approximately 88,000 farmers against drought. Micro-level solutions are not only targeted to smallholder farmers, and there is a wide range of products aiming to protect SMEs and any individual in general. Examples of this are the products developed by the Microinsurance Catastrophe Risk Organisation (MiCRO) in Guatemala, El Salvador and Colombia protecting the business interruption of any small and micro-entrepreneur caused by drought, earthquake and excess rain, or the Livelihood Protection Policy of the Munich Climate Insurance Initiative (MCII) in Jamaica, Saint Lucia, Grenada, Belize and Trinidad & Tobago. Also relevant are traditional property products, such as fire insurance that typically includes coverage of natural disasters such as floods, excess rain, earthquake, amongst others.

4 China has generally seen much innovation and product rollouts in the area of CRI. Swiss Re and Groupama AVIC are also working closely with the People's Government of Aba Tibetan, Qiang Autonomous Prefecture of Sichuan Province, in order to strengthen resilience in China's Mao County through a multi-peril parametric solution. The country-level natural catastrophe programme insures Mao County and the Tibet Plateau against earthquakes, landslides, heavy rainfall and public safety accidents (Chen, 2019). More recently, in 2019, an agriculture natural catastrophe parametric programme was launched to cover seven counties in the Shaanxi Province, where extreme poverty is predominant (Chen, 2019). Similar solutions are being offered in the Philippines, where with the support of the World Bank, Nephila, Munich Re, Swiss Re, AXA, Hannover Re, Hiscox Re, Allianz Re and SCOR a Catastrophic Risk Parametric Insurance Program was designed to protect 25 disaster-prone provinces and the national government against typhoon and earthquake. The solution allows the provinces and the national government to respond more rapidly and effectively to the impact of natural disaster events. The premiums are financed by the National Disaster Risk Reduction and Management Fund (Artemis, 2017) (Business Mirror, 2018).

This paper is a thought-provoking piece that aims to provide a fresh perspective on supervisors' role in reducing the insurance protection gap in respect of climate risks. The paper provides several ideas and supervisors are invited to explore them and analyse how appropriate they could be for their own jurisdictions. This paper does not focus on the insurer's own financial soundness nor business continuity against climate risks.

In the first section, this paper emphasises why we must take action urgently and how the insurance industry can build resilience through different pathways. In the second section, this paper will explore what role supervisors could play in order to build resilience forthwith.

1. SETTING THE SCENE: A CALL FOR URGENT ACTION

1.1 The need to build disaster resilience for the most vulnerable

The prevalence and severity of natural disasters are on the rise due to climate change. Natural disasters such as tropical storms, hail, floods, droughts, hurricanes, landslides, wildfires, earthquakes, amongst others are becoming more frequent and severe because of global warming[5]. The frequency of weather-related events has increased six-fold since 1950s[6] and the trend is likely to continue. Temperatures will most likely continue to rise, precipitation patterns will continue changing, heat waves and droughts will be more intense, sea levels will rise, hurricanes will become stronger and more intense and the arctic is expected to become ice free[7]. Studies predict that the number of drought days could increase by more than 20% in most of the world by 2080, the global volume of glaciers could decrease up to 85% in 2100[8], and sea levels could rise another one to four feet by 2100. Specifically, for Bangladesh a one-meter sea level rise would inundate 18% of Bangladesh's land and will likely affect 27 million people by 2050[9].

Climate risks affect vulnerable and marginalised segments of the population disproportionately. Vulnerable countries and segments of the population are more likely to suffer more adverse outcomes from natural disasters. According to the World Bank from 1995 to 2014, 89% of storm-related fatalities were in lower-income countries[10] and, for instance, developing Asia accounted for almost 55% of the disaster fatalities worldwide from 2000 to 2018[11]. Assuming similar exposure to natural disasters, the impact is more acute in developing countries due to more inequality, lower incomes, weaker institutions, limited risk management strategies, amongst other factors. Within the local population, vulnerable segments such as smallholder farmers, small and micro entrepreneurs (SMEs) and households do not have the safety nets to bounce back after a shock. They have fewer assets and savings, irregular incomes, they work in informal economies, are faced with greater asymmetries of information and power, amongst other aspects. Also, marginalised communities tend to live in risk-prone areas.

Estimations of losses caused by natural disasters are concerning but they only provide a partial indication of the real losses suffered by the most vulnerable. The total asset losses from natural disasters across 116 countries is on average US$ 327 billion a year according the

5 According to researchers, climate change is a factor that intensifies hurricanes on the U.S coast as CO2 and greenhouse gases are helping to diminish the wind shear that can act as a barrier to storms (Ting, Kossin, Camargo & Li, 2019). (Mcgure, 2012) (Mcguire, 2016)

6 (Climate Wise, 2016)

7 (NASA, 2018)

8 (Hallegattte, et al., 2016) (Barcena, Samaniego, Galindo & Ferrer Carbonell, 2018) (NASA, 2018).

9 (Thomas, et al., 2013)

10 (Hallegattte, et al., 2016)

11 (ADB, 2019)

2015 United Nations Global Assessment Report on Disaster Risk Reduction (GAR)[12]. More specifically for low and lower-middle income countries, according to a study of the catastrophe risk modelling company Risk Management Solutions (RMS) the average annual asset losses from natural catastrophic events in these countries is equal to US$ 29.1 billion[13]. These numbers are concerning; yet they only provide a partial indication of the economic shocks suffered. Many estimations do not account for longer-term losses or the disproportionate impact on vulnerable and marginalised segments of the population. Indeed, a recent study by the World Bank introduced the concept of "well-being losses" that considers not only the asset loss but also the different abilities of poor and non-poor people to cope with asset losses[14]. The report concluded that well-being losses are equivalent to consumption losses, which are 60% larger than asset losses. Therefore, considering that the GAR 2015 estimated total asset losses from natural disasters in these countries to be an average of US$ 327 billion a year, the well-being losses were approximately US$ 520 billion a year. This figure is clearly much larger than the widely reported asset losses.

Natural disasters offset poverty alleviation efforts and set back the vulnerable and marginalised from rising out of poverty. According to the World Bank, estimates for 89 countries found that if all natural disasters in 2017 had been prevented, the number of people in extreme poverty – those living on less than $1.90 a day – would have fallen by 26 million[15]. Taking the example of Senegal, between 2006 and 2011, 45% of poor Senegalese households escaped poverty, but 40% of non-poor households fell into poverty, a large part due to natural disasters[16]. According to the World Bank, the same situation depicted for Senegal could occur in other countries, indeed climate change could push an additional 100 million people into extreme poverty by 2030[17]. Climate change is reducing global GDP, it is expected that it will be reduced by 7.11% by 2100 and it is also increasing global economic inequality[18]. In that sense, climate change is exacerbating all the factors that make countries and vulnerable communities suffer more acutely.

12 (UNISDR, 2015)

13 (RMS, 2017)

14 (Hallegatte, Vogt-Schilb , Bangalore , & Rozenberg , 2017)

15 Ibidem

16 (Dang , Lanjouw, & Swinkels , 2014)

17 (Hallegattte, et al., 2016)

18 (University of Cambridge, 2019). Indeed, a recent study showed that even though global economic inequality has narrowed over past decades, that gap would have narrowed by about 25% more, had global warming not been a factor. (Diffenbaugh & Burke, 2019)

1.2 The role of the insurance industry in building climate risk resilience

Insurers can play a crucial role in building resilience of low-income and underserved populations against climate risks. As risk underwriters, they can do so through three pathways: first and foremost, by offering risk transfer solutions in the form of appropriate insurance products; secondly, by proactively integrating holistic risk management perspectives in their products; and third, by lending their risk expertise to initiatives beyond the insurance industry. Additionally, while not a focus of this paper, **Box 2** provides some insights on how insurers can also build resilience as institutional investors.

A key role of insurers as risk underwriters is to offer appropriate and innovative insurance products. Insurers and reinsurers can build resilience of governments, households, smallholder farmers and small businesses by guaranteeing that losses will be indemnified in the event that the insured suffers a disaster-related loss. At the micro level, this encourages the accumulation and increase of income, assets and capital; it enhances peace of mind and it enable insureds to manage their risks more efficiently without resorting to harmful risk coping tools. This also has benefits to the economy as a whole. Evidence suggests a causal relationship between insurance market activity (life and non-life) and economic growth[19]. Countries with robust insurance markets recover faster from the financial impacts of extreme natural disasters, whereas countries with low insurance penetration experience declines in economic growth and fiscal losses[20]. However, many insurance products available today are not adequate for addressing climate risks faced by the low-income and underserved.

Insurers and reinsurers can proactively adopt a more holistic risk management perspective in their product offering. As risk experts, insurers can also offer products and services that not merely transfer risk, but also encourage consumers to adopt integrated risk management approaches in order to avoid or reduce losses. Insurance is not the silver bullet to effective climate risk management, but rather one piece of the DRR puzzle. Insurance is a risk transfer tool that that is appropriate for managing high-severity residual risks of low frequency that cannot be reduced or managed otherwise (see **Figure 1**). In the case of frequent and low-severity risks, the most effective responses could be investment in better disaster-resilient infrastructure, education to promote risk understanding, strengthening of community prevention measures and early warning systems, amongst others (**Figure 1**).

19 (Arena, 2008) (Ward & Zurbruegg, 2000) (Outreville , 1990) (Haiss & Sümegi, 2016) (Outreville, 2011) (Lester, 2016)

20 For instance, in 2010 Haiti and New Zealand were hit by two physically similar earthquakes, however the economic consequences were different mainly because of insurance. Indeed, 81% of the direct losses suffered by the earthquake in New Zealand were covered by mandatory insurance products, whereas the coverage in Haiti was below 1% (Von Peter, Von Dahlen & Saxena, 2012). (Golnaraghi, 2018) (Von Peter, Von Dahlen & Saxena, 2012)

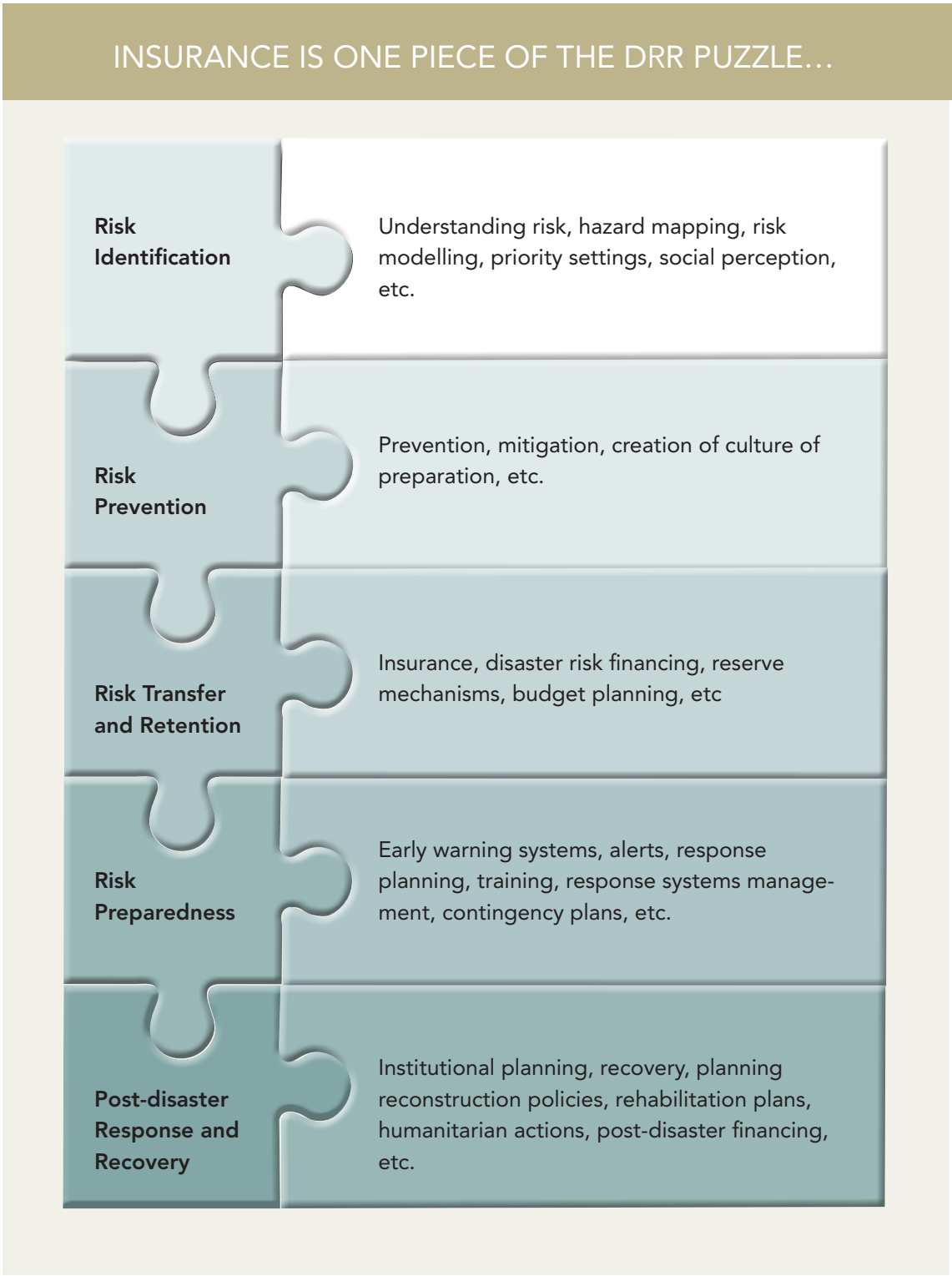
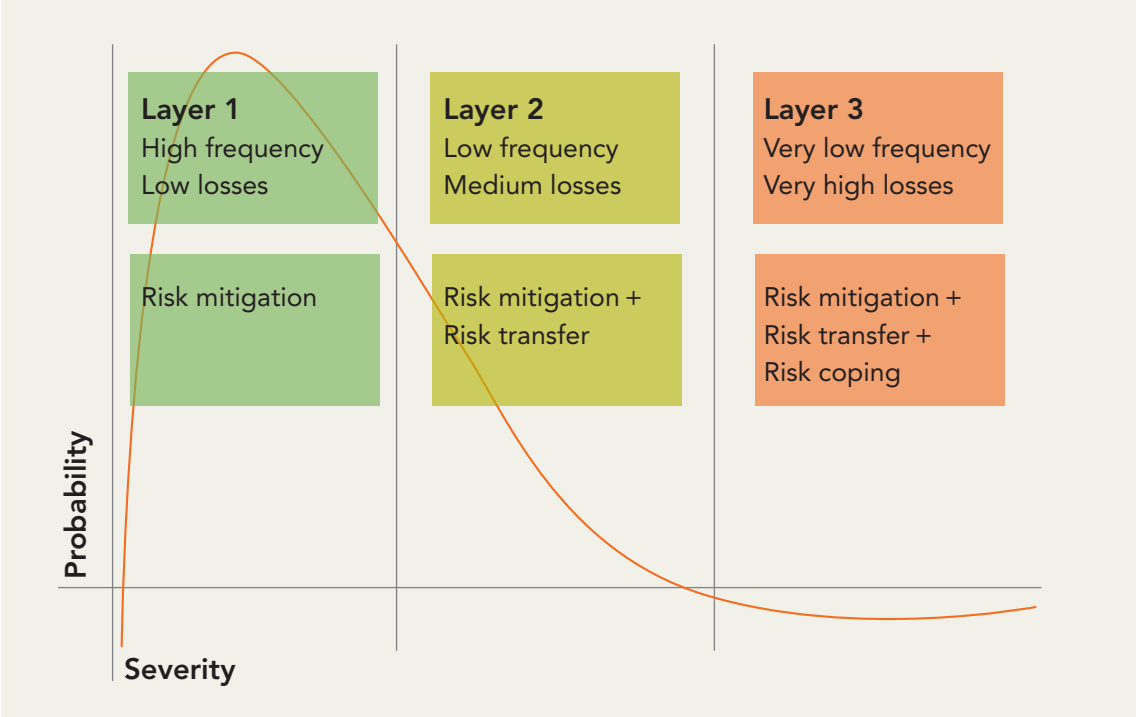


Figure 1: **Insurance is not the silver bullet**
Source: Adapted from (World Bank, 2016)

…AND PART OF A LAYERED APPROACH TO MANAGING RISKS



Insurers are in a position to integrate into their business models ways to offer, incentivise or encourage the adoption of comprehensive disaster risk reduction approaches. For instance:

- **Offer products that contribute to broader integrated risk management initiatives,** such as a large-scale programmes aiming to build resilience from a holistic point of view[21]. For instance, the R4 Programme of the WFP combines four interventions: risk transfer for instance through microinsurance products; creation of risk reserves, for instance through the creation of voluntary saving groups; risk reduction for example through conservation measures in agriculture; and smart risk-taking for instance by promoting productivity for instance by facilitating access to credit and encouraging livelihood diversification. The R4 is currently offered in several countries across sub-Saharan Africa, including Ethiopia, Senegal, Malawi, Zambia, Kenya and Zimbabwe, covering approximately 88,000 farmers as at 2018. Similar projects are being launched frequently, for instance in October 2017 a project known as Bundled Solutions of Index Insurance with Climate Information and Seed Systems to manage Agricultural Risks (BICSA) was launched in India. Interestingly, there is a trend developing integrated risk management solutions, as these added services that build resilience are also providing tangibility and therefore making a more appealing case for insurance.

21 Such comprehensive approaches to DRR are supported by a recent study by the World Bank, which concluded that if governments adopt "resilient packages" the gain could be equivalent to a US$ 100 billion increase in annual global consumption: "expanding financial inclusion, disaster risk and health insurance, social protection and adaptive safety nets, contingent finance and reserve funds, and universal access to early warning systems would also reduce wellbeing losses from natural disasters. If all countries implemented these policies in the proposed "resilience package," the gain in well-being would be equivalent to a $100 billion increase in annual global consumption" (Hallegatte, Vogt-Schilb, Bangalore & Rozenberg, 2017).

- **Offer products that incentivise or help the insured to adopt resilience measures.** For instance, in Australia, Suncorp has developed insurance products with explicit premium reductions to encourage North Queenslanders to strengthening their homes against cyclones in the context of the "Protecting the North" project in Queensland[22]. Also, in Turkey, purchase of mandatory earthquake policies has been incentivized by offering 20% discount at the time of annual renewal of the policy or offering substantial discounts if the buildings were built after 2007, along with evidence of the existence of an insurance policy[23].

- **Provide complementary tangible "resilience services"[24] that reduce vulnerability.** Some of this can be provided as bundled services. These services could be: providing regular maintenance, assessment of exposure, weather information and early warnings, amongst others. These services could include upgrading the property to improve its resilience, regular maintenance, recovery and repairs, and financial compensation. For instance, AIG offers a "premium wildfire protection service" to its private client group, where crews are deployed to apply fire retardant when policyholders are threatened by wildfire in California and Colorado[25]. This type of services could be replicated for programmes or products serving underserved groups.

As experts in risk management, insurers could also voluntarily lend their expertise to initiatives beyond the insurance industry to promote risk understanding. The insurance industry (including insurers, reinsurers, brokers, loss adjusters, actuaries, consultants, amongst others), as risk management experts, can build tools to better quantify climate risks, build robust datasets and assess vulnerability. Insurers are a vital source of key information to understand risk through models, datasets, forecasting tools and observations, amongst others. This is particularly important in the CRI context where the lack of quality data is an important obstacle for all entities dealing with climate risk.

- **Supporting the development of other disaster risk financing tools.** The industry is supporting the modelling of the Forecast Based Financing and the Drought Finance Facility that aims to benefit international humanitarian organizations through the Start Network. It is also supporting the design of other financing facilities such as the World Bank of Pandemic Emergency Facility, which has an insurance component. The industry is also assisting with the modelling of disaster risk financing tools for governments such as catastrophe bonds, contingency funds for natural disasters and contingency credit solutions.

- **Sharing of models with national and local governmental entities and disaster risk reduction authorities** to improve their vulnerability models, hazard data, urban planning, transport infrastructure, climate counteractions, hazard-proof structures, risk management strategies, amongst others. For instance, the insurance industry actively provides technical expertise in the New Jersey Resiliency Network that supports

22 (SUNCORP, 2018)

23 (ADB, 2019)

24 A study of ClimateWise noted that insurers could provide "resilience services" that will draw on aspects of facilities management, disaster recovery, 'build and operate' contracts, and insurance" (University of Cambridge Institute for Sustainability Leadership (CISL), 2016).

25 (Herweijer , Ranger & Ward, 2009)

municipalities in strengthening their local resilience to climate risks. The South African insurer Santam contributes to the Living Lands project in Port Elizabeth by providing risk expertise. The Ministry of Agriculture, Irrigation and Water Development of Malawi holds and monitors the Africa Risk View Software (ARV) that quantifies weather related food security cost in the region and is a dataset created in the context of the sovereign insurance programme ARC, with the support of the WFP. In this respect, a recent study of the Grantham Research Institute on Climate Change and Environment of LSE found that there is a "clear scope for a dynamic interaction between insurers and other actors such as governments, planners, property developers, investors, farmers, or individuals where symbiotic use and generation of climate risk information can advance mutual goals"[26].

- C**reating innovation hubs or incubators** to promote and disseminate latest developments and analyses on climate risk, including risk mitigation and adaptation measures and new sources of data. Have such centralised hubs can also help strengthen relationships with research initiatives that are involved in the field[27].

- **Contributing via CSR activities.** Tokio Marine has been involved in mangrove planting activities across the Asia Pacific region since 1999 as part of its CSR activities[28]. It is noteworthy that in India, insurers are required by regulation to allocate a percentage of their business to CSR.

- C**ontribute to policymaking on resilience** and ensure that regulation unlocks opportunities to boost resilience through strong dialogue and capacity building to policymakers, regulators and supervisors. For instance, they can provide consultation, create public-private committees, and they could even "provide skilled staff on secondment to government departments and agencies to help bridge the gap of language and approach between the public and private sectors"[29] .

- **Support other private sector partners in climate risk management.** La Positiva, an insurer in Peru, supports a financial institution that distributes agricultural insurance products in improving their climate risk assessments of potential clients. Risk assessments can also help entities in the agricultural value chains diversify the locations of suppliers and transport links, construct new resilient facilities, amongst others.

Despite the potential, both in developed and developing countries, the contribution of the insurance industry is far from being fully harnessed. The total economic losses from natural catastrophes in 2018 were US$ 155 billion, however less than half were insured (76 billion)[30]. Recently, a study by the ADB found that across Asia including Japan, just over 8%

26 (Surminski, Barnes & Vincent, 2019)

27 (Golnaraghi, 2018)

28 (University of Cambridge Institute for Sustainability Leadership (CISL), 2016)

29 Ibidem

30 (Sigma, 2019). Bear in mind that the single biggest natural catastrophe insurance loss-event of 2018 was Camp Fire in California (US$ 12 billion). Therefore, occurring in a developed economy.

of catastrophe losses since 1980 were covered by insurance[31]. Specifically for low income and lower-middle income countries, the RMS study found that the average annual asset losses from natural catastrophe is equal to US$ 29.1 billion, but only US$ 0.9 billion of these losses are covered by insurance (approximately 3% of total losses)[32]. For agriculture insurance for smallholder farmers in the developing world, a report of ISF advisors estimated that that the percentage of smallholder farmers who have agriculture insurance coverage is less than 20% globally, with Sub-Saharan Africa being particularly low at less than 3% in (see **Figure 2**).

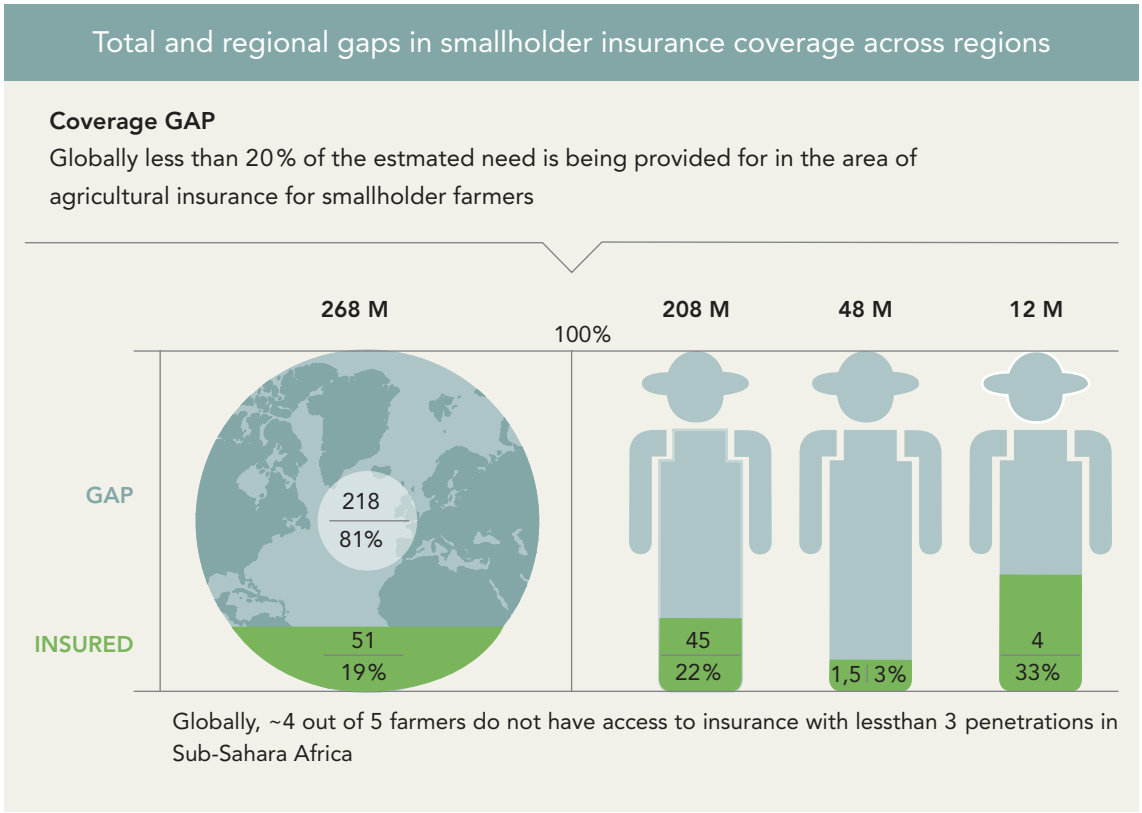


Figure 2: Protection gap of smallholder farmers

Source: (ISF, 2018)

31 (ADB, 2019)

32 (RMS, 2017)

BOX 2

THE ROLE OF THE INSURANCE INDUSTRY AS INSTITUTIONAL INVESTORS

The insurance sector plays a key role as institutional investors in the economy, as it aggregates domestic savings and channels them into "long-term investments" in capital markets. Together, insurers and reinsurers are one of the most important global institutional investors. The global insurance industry manages around a third of the world's investment capital, approximately US$ 30 trillion[33]. As institutional investors, insurers and reinsurers could contribute towards DRR and CCA in two main ways.

Firstly, through directly investing in investments that enhance climate resilience and adaptation, they could fill an urgent need for investment: US$140 million to US$300 billion per year by 2030, escalating to US$280 billion to US$500 billion annually by 2050[34]. Examples of such investments include:

- Infrastructure such as flood-defence infrastructure projects, cyclone-safe evacuation centres, replanting mangrove forests to absorb storm impacts and prevent coastal erosion or irrigation infrastructure such as reservoirs.
- Financial assets, such as shares or bonds of companies or governments that promote resilience and adaptation, green bonds financing climate-adapted water infrastructure, or clean energy bonds[35].
- Resilient property that is resilient to climate risks, such as communication links, power stations, rail infrastructure that can operate despite sea level rise, extreme hot weather and floods. By making these investment choices insurers will reinforce desirability of resilience and this will lead to an increase of demand for these assets and resilient projects.

Governments and international donors are currently the predominant investors of this type of assets. Insurers, despite the mutually reinforcing link between resilience and insurance, currently contribute to a limited extent[36].

Secondly, insurers can actively reduce their carbon investment footprint. Currently, less than 0.5% assets invested by the world's 80 largest insurers are in low-carbon investments. Most insurers do not factor in climate risks in investment decision making. 9 in 10 investments strategies in the sector fail to align with the Paris Agreement goal. Nonetheless there are some signs of insurers starting to work towards this goal. Global insurers are adopting policies aiming to phase out coal-related underwriting and investment. AXA was the first global investor to initiate divestment from coal, and the first to phase out the insurance coverage of coal clients. Zurich recently committed

33 (University of Cambridge Institute for Sustainability Leadership (CISL), 2016)

34 (UNEP, 2016)

35 (Climate Bonds Initiative, 2018)

36 (University of Cambridge Institute for Sustainability Leadership (CISL), 2016)

to UN climate pledge and shared plans to lower fossil fuel exposure, while Chubb published their climate policy on the same[37]. Insurers are also now exploring strategies such as no longer underwriting risks for companies whose revenues or energy production are substantially based on coal, and consciously choosing companies that invest in green and clean technologies. In order to ensure accountability, insurers taking steps ensure disclosure of climate-related financial information. All these efforts are part of the integration of ESG considerations into their investment process[38]. Initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) that aims to promote clear, comparable and consistent disclosure of information are another important step.

1.3 The barriers to reduce the insurance gap

The insurance industry is keen to expand its role in building disaster resilience[39], but it has identified various obstacles to harness that role. These obstacles relate to policy, regulation and supervision, as well as market demand and supply factors. In 2019, the A2ii carried out a survey to explore the obstacles that practitioners face when designing and implementing solutions to manage climate risks and natural disasters (see **Figure 3**). The findings are broadly consistent with a 2018 study by the Geneva Association[40], which drew out the external hurdles that hinder insurers' contribution[41].

Roughly three-quarters of the respondents of the survey noted that regulation and supervision could be an important obstacle in hindering innovation. Specifically, they refer to 5 obstacles that are summarised in **Figure 3**. The respondents also proposed some solutions to address the obstacles that they identified (see **Figure 4**). A number of the obstacles and solutions listed are not exclusive to climate-related aspects, but rather address the supervisor's overall approach to innovation. These issues are also largely similar to issues that often arise in inclusive insurance development. Similar ones include allowing wide range of different distribution channels, enabling digitalisation processes and reducing taxes. A solution that is more specific to climate risks and natural disasters however is the suggestion to permit index insurance.

37 (Rensurance News, 2019)

38 (Golnaraghi, 2018)

39 There are several clear signs to this. This is reflected in the 2014 Climate Risk Statement of the Geneva Association, which aggregates the world's largest insurers and reinsurers (The Geneva Association, 2014). To date, 66 companies have signed the Principles of Sustainable Insurance (PSI) launched in 2012 that (UNEP FI, 2012). This commitment was reiterated in a recent study comprising interviews with 62 C-level executives from 21 companies from the insurance industry which concluded that they "want to contribute more" (Golnaraghi, 2018). Insurers and reinsurers also participate actively in global and regional platforms that aims to explore ways to harness their contribution, such as the Insurance Development Forum (IDF) and InsuResilience. However, the potential and interest have yet to be fully realised.

40 (Golnaraghi, 2018)

41 External hurdles hindering the role of insurers as risk underwriters: (i) Limited access to risk information and related risk pricing difficulties, (ii) Public policy, regulatory and legislative issues, (iii) Consumers lack awareness about insurance, (iv) Weakness of domestic insurance markets, (v) Limited take-up of disaster insurance, (vi) Regulatory barriers to access global reinsurance, (vii) Scalability and sustainability of insurance programmes.

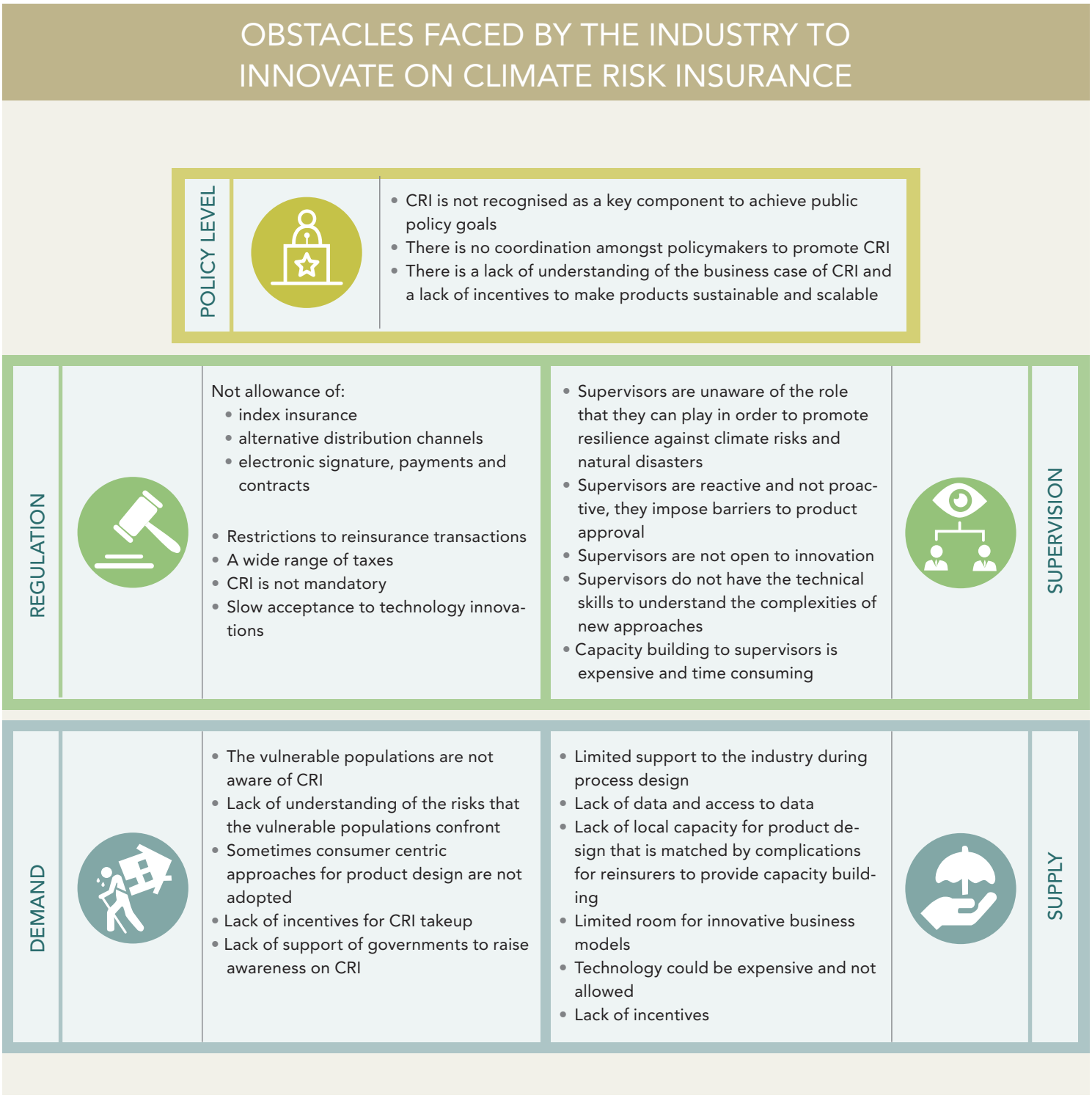


Figure 3: Obstacles to CRI according to the industry

REGULATORY AND SUPERVISORY OBSTACLES

1. Index insurance is not allowed

Not having clear regulation that defines and allows index insurance discourages supervisors to allow these innovative products

2. Supervisors do not understand innovative approaches

Supervisors do not understand the complexities of new approaches that are not explictiy recognised by the regulation. It is extremely time consuming to build that capacity and this delays products approval.

3. Alternative distribution channels are not allowed

Entities that can be used under innovative selling approaches are not allowed to act as distribution channels.

4. Limitations to the process of digitalisation

Not allowance of electronic signatures, electronic contracts and electronic payments. Allowance of airtime deduction is discouraged.

5. Restrictions to reinsurance transactions

Reinsurers face trade barriers when providing insurance capacity to markets with underserved population. There are restrictions to cross border reinsurance transactions.

6. Taxes are an obstacle to affordability and client value

Taxes and fees discourage the private sector to design affordable products and also make products more expensive therefore unaffordable.

Figure 4: Regulatory and supervisory obstacles

THE SOLUTIONS PROPOSED BY THE RESPONDENTS

1. Recognition of CRI is key for policymakers but it is not the silver bullet

- All policymakers should be aware of the role of CRI to achieve policy goals
- A climate smart agriculture comprehensive policy where CRI is part should be discussed and adopted
- CRI as a key component of social safety nets
- Awareness of other disaster risk reduction and disaster risk financing tools
- Understand that there should be a business case for CRI
- Resilience against climate risk goes beyond CRI, insurance products to protect health and against accidents are equally or more important

2. Creation of multi-stakeholders task-forces to improve accountability, coordination, dialogue and experience sharing

- It is not only about recognition but the creating of concrete steps to move forward
- Cooperation and constant dialogue between the private and public sector, between regulators and other government agencies and between supervisors and the industry and between supervisors of all the participants of the value chain
- Enable safe space discussion platforms for regulators, supervisors and the industry to share lessons and experiences

3. Regulation should promote responsible innovation

- Universal acceptance of index insurance products
- Embracing technology to enable the design products with value and to effectively protect consumers
- Adopt sandboxes approach
- Recognition of CRI as mandatory products when they pass certain standards agreed by the regulator
- Allow new distribution channels, new risk takers and new business models
- Allow airtime to pay premiums
- Adopt a base level model of regulation globally
- Require disclosure of climate risk by the public and private sector
- Include climate related risks in traditional fire insurance products as opt out covered risks

4. Comprehensive capacity building for supervisors and regulators

- Promote understanding with supervisors and regulators about the need to close the protection gap and their roles to promote resilience
- Investment of their time and resources of supervisors to understand the market particularities and mapping risks
- Provide training about the complexities of innovative approaches used in CRI

5. Supervisors should adopt a proactive approach

- Be proactive by monitoring products ensuring that they have value for consumers
- Be in constant dialogue with the industry in order to understand complexities
- Be open minded to find solutions
- Have a clear vision to develop the CRI market and constantly assess barriers to develop it
- Active participation in product design phases
- Allow sandbox approaches to enable innovations
- Flexible and speedy approval process

6. Funds need to be mobilised to build resilience

- Recognition of subsidies or other financial incentives to the industry at least for the early stages of operation
- Incentivise risk sensitive investments by the public and private sectors to fund resilience
- Create a fund for R&D of climate risk insurance solutions
- Invest in building climate risk reduction awareness

7. It is not about quantity but quality

- It is essential to understand the preferences of the end consumer
- Monitoring and evaluation (M&E) is key

8. Awareness on risk exposure and reduction should be promoted

- It is essential to promote awareness by end consumers about risk exposure and climate risk reduction
- It is essential to promote awareness of available solutions with all stakeholders

Figure 5: Solutions proposed by the industry

2. THE ROLE THAT SUPERVISORS CAN PLAY

Supervisors are well-placed to catalyse action to strengthen resilience against climate risks. The following sections will explore how insurance supervisors can do so via two pathways: firstly, developing the market by stimulating supply and demand of valuable and responsible climate insurance solutions (2.1). The second pathway is by promoting the spread and adoption of climate risk management understanding and practices internally as well as among critical stakeholders, including by actively harnessing the role and expertise of the insurance industry as risk experts (2.2). It is recognised however that the measures that supervisors can feasibly carry out is very much shaped by their country context. In countries where supervisory mandates and resources are focused mainly on financial stability and market conduct, supervisors could have less resources or flexibility to explore roles beyond traditional supervisory activities as opposed to countries where supervisors have a broader insurance development mandate and flexibility to influence policymaking. Large-scale, national-level policy or regulatory measures will also need to factor in the political and policy environment.

2.1 Stimulating the market for climate risk insurance

2.1.1 Supply

Climate risk is an insurance risk that is becoming more and more complex to understand and manage. Offering CRI requires specialist technical expertise and datasets. In many markets, insurers operating in the domestic market primarily offer 'traditional' product lines to market segments that are familiar to them, where they rely on well-established pricing and underwriting models and data sources. Insurers are often reluctant to enter into new and complex lines, partly because they lack know-how and data, and partly because of uncertain profit prospects. Compliance costs and the regulatory burden add another layer of uncertainty: supervisors typically require insurers to meet certain requirements and expectations when taking on new risks or launching new distribution models, and many insurers see product approval processes as onerous and time-consuming, especially where regulatory requirements need to be adapted to enable new business models.

There are some options that supervisors can explore to ease some of these challenges. The following sections explore how supervisors can stimulate supply by: enabling risk carriers within the domestic insurance market (2.1.1.1); and enabling innovative products, channels and business models (2.1.1.2).

2.1.1.1 Underwriting capacity within the domestic insurance market

Insurance markets in developing countries often lack the capacity to design and implement innovative risk transfer solutions, particularly those that protect the low-income and underserved. Often, local insurance underwriting capacity is limited, but the industry may also face challenges with access to reinsurance. Furthermore, local teams often lack actuarial skills, product design and underwriting expertise and a general understanding of climate risks as

well as the needs of underserved segments. In this respect, insurance supervisors could play a meaningful role by taking enabling approaches in the following areas:

1. **Capacity building in the local industry.** Some countries have taken active steps to develop local talent. One way is through the establishment of industry training institutes, such as the Bangladesh Insurance Academy (BIA) or the National School of Insurance in Brazil. The National Insurance Commission of Ghana also supported the participation of local insurers in international capacity building initiative and conferences. Supervisors themselves also often participate in or organise regional industry or supervisory dialogues. Supervisors could use these platforms as opportunities to discuss and stimulate the industry's thinking on the topic of CRI. Where supervisors have the resources, they could also embark on more targeted initiatives such as supporting the creation of specialised training agencies in the country.

2. **Access to global reinsurance.** Global reinsurers play a crucial role by providing reinsurance capacity to the local insurance market. As many have global experience and expertise relating to CRI solutions, reinsurers often also provide technical support in product design and pricing, risk modelling and exploring innovative business models. Regulatory requirements can effectively enable or impede industry access to reinsurance. The list below sets out some examples:

    - Some countries set a minimum local retention threshold[42] in reinsurance arrangements for insurance products against certain natural disasters. While such thresholds may be in the interest of financial stability, they may go above the level of retention that local insurers are willing or able to take on. This could dissuade them from offering climate risk products.

    - There are also countries who require insurers to cede a minimum level to local or government-owned reinsurers, such as 50% in the case of Bangladesh. If public reinsurers do not have the expertise or capacity to support the solutions, this may further stifle the offering of appropriate products.

    - Some countries impose an income tax on reinsurance premiums, which impacts pricing. The Tax Code in Armenia stipulates that reinsurers without a permanent local establishment must pay 5% of incomes derived from reinsurance fees as profit tax. A targeted tax exemption could help reduce premiums, making reinsurance premiums more affordable for local insurers. While tax regulations are not within the purview of insurance supervisors, supervisors usually have sufficient influence to raise the issue with the relevant policymaker or authority.

    - Some countries impose restrictions of cross-border reinsurance, which further limits access to reinsurance.

42 Often, the level of climate risk retention by local insurers in reinsurance arrangements are very low (typically 10 to 20%), particularly in the initial stages. Such limited retention is a mechanism to cope with the lack of capacity and skills of local insurers, and the goal is to increase the retention as local capacities are built. However, a hard regulatory limit stifles the ability of local insurers to retain a level that is consistent with their risk appetite.

- In some cases, the size of the business brought by an insurer is not large enough for global reinsurers, which could mean either not having access to reinsurance or having access on inferior terms and conditions. In this case, risk pooling platforms where insurers join forces to improve the conditions of insurance and reinsurance contracts are positive. This is the case of the Latin American Reinsurance Group (LARG) created by cooperative insurers of Latin America with the support of the International Cooperative and Mutual Insurance Federation (ICMIF) in order to confront the challenges in obtaining reinsurance for microinsurance products due to the low premium volumes of these products. Since 2004, LARG negotiates the reinsurance coverage for the microinsurance portfolio of all the members, as a single entity. This has helped these insurers to obtain better pricing, terms and conditions due to economies of scale.

3. **Licenses for insurers with expertise.** Insurers who have a good global track record or expertise in CRI can also play an important role. In enabling such players to operate in the market, supervisors could potentially accelerate the provision of CRI in the local market by virtue of the spill over of expertise and stimulation of industry interest in the business line. However, as many of such insurers may be foreign insurers, supervisors will have to factor in the national policy stance on financial market liberalisation.

4. **Government-led insurance programmes.** There are several countries where the government directly funds insurance cover against natural disasters, either through a public insurer or through a dedicated public insurance fund. Supervisors can contribute by providing advice on the legal, regulatory and financial considerations in the set-up of such funds, or in capacity building for public insurers. However, most of the time supervisors are excluded of these discussions. Examples of government-led schemes include:

    - In India the National agriculture insurance Scheme PMFBY, is implemented by the public agricultural crop insurance company, the Agricultural Insurance Company of India (AICI) and some private insurers. This model is considered as one of the largest models in the world. As of 2018, it covers 40 million farmers.

    - In the Philippines, the Philippines Crop Insurance Corporation (PCIC), a government-owned insurer offers different insurance programs covering crops and livestock, in 2015 it was protecting 486,837 individuals.

    - In Morocco, the law n.110–14 issued in 2016 provides the creation of the Solidarity Fund for Natural and Man-made disasters (the FSEC) and the offer of mandatory insurance for this type of disasters. While the implementation of the fund is on hold, it is expected that the FSEC will be fully functional in 2020.

5. **Coinsurance pools.** In countries where one single insurer does not have the capacity or the skills to offer CRI, the creation of coinsurance pools has unlocked opportunities for the development of CRI. Many are founded on public-private partnerships (PPP), where the government provides support through subsidies, reinsurance, or taking on the risk directly. Supervisors could play a role by providing advice in the setting up of the pool or setting clear regulatory perimeters to ensure that these pools can effectively operate, while preserving financial stability or market competition. For example, supervi-

regional collaborative platforms[45]. This approach has been adopted in the context of regional integration and insurance market liberalisation, such as in the case of the European Union.

- Another option is to have targeted exceptions for specific products that are deemed critical. Colombian law[46] allows overseas insurers to issue agriculture insurance policies in Colombia from abroad, directly or through authorised intermediaries. The Superintendencia Financiera de Colombia – the financial supervisor of Colombia keeps a registry of such insurers and their intermediaries: the Registry of Foreign Insurers and Intermediaries of the Agricultural Insurance (RAISAX)[47]. This approach comes with potential risks: SFC does not regulate these overseas insurers and their intermediaries. Accordingly, policyholders of products underwritten by these entities are not considered to be "financial consumers", which limits their ability to file financial consumer protection actions before the SFC[48]. This could leave consumers in a vulnerable situation. Supervisors may need to find alternatives to ensure appropriate protection.

8. **Technical service providers (TSPs).** Specialised entities[49] that have technical knowledge on CRI solutions can help to deepen underwriting skills and capacity in the industry. Depending on their specific niche, they can offer a range of support from product design, implementation, brokerage, financial education, consumer protection, provision of technology platforms to claims processing, amongst others. Some entities participate as part of technical assistance agreements or more broadly in the context of donor-funded projects[50]. In terms of their regulatory status, TSPs typically operate as outsourcing service providers, such as in the case in Armenia and Madagascar, brokers and agents, or they may not be subject to regulation.

9. **Potential of leveraging other risk transfer mechanisms**. Unserved and underserved populations often leverage a variety of community structures and risk transfer tools, some of them informal, to manage risks. Technological innovations have resulted in a myriad of platforms that support such tools. These two factors are particularly relevant for CRI where microfinance organisations, savings and credit cooperatives and other types of entities actively offer risk management solutions against natural disasters. In Bangladesh, PKSF, an apex organisation that aggregates MFIs provides microinsurance solutions to MFIs and has set up a Covariant Risk Fund to manage the risks of natu-

45 However, cross-border insurance also raises several concerns in the context of cross-border supervision. This paper provides some examples of challenges of cross-border insurance in the European Union (Schoenmaker & Sass, 2016). This model could be interesting in countries where projections of scale are low because of size and population. Certainly, this alternative does not only involve insurance supervisors as it is politically sensitive and complex, and concerns relating prudential stability, consumer protection, regulatory capacity and business integrity should be considered. These challenges have been confronted by the Association of Southeast Asian Nations (ASEAN) where Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam are members (Adams, Irwin & Capparelli, 2015).

46 The law 1450 of 2011

47 (SFC, 2018)

48 (Herrera , 2019)

49 Examples include ACRE Africa, PULA, MicroEnsure, MiCRO, Celsius Pro, Farm Force, Farm Drive, amongst others. Many research institutions are also playing a key role in designing and implementing these solutions, amongst them the International Research Institute for Climate and Society of the Earth Institute of Columbia University, or the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

50 (ISF, 2018)

ral disasters of these MFIs. Supervisors are invited to explore the reasons behind the existence of these models and the business case that supports them. The Insurance Commission of the Philippines moved to formally license Mutual Benefit Associations (MBAs). One of the biggest MBAs in the country, CARD MBA, has played a key role building resilience in the aftermath of the Typhoon Haiyan in 2013. According to a study of the Institute for Sustainability Leadership of the University of Cambridge "mutual microinsurance is likely to be most effective in combination with other financial mechanisms, such as access to credit and emergency aid"[51].

2.1.1.2 Innovative products, channels and business models

When coffee growers in Colombia and Guatemala were asked about top-of-mind risks, they indicated price volatility, which "increases at a statistically significant level with a climate shock". Supervisors however may deem a price volatility product as a future or a derivative rather than insurance, thus discouraging industry interest in pursuing such insurance products. In most developing economies, futures or derivatives markets are rudimentary or not available. Even where such capital market instruments are available, they are rarely affordable for smallholder farmers. In the end, the farmers lose out the most.

This anecdote illustrates how CRI can entail exploring new target segments and risks in order to meet the needs of the vulnerable. The industry may need to pioneer approaches to product design, distribution and servicing which fall outside definitions, ideas and practices that are familiar to the industry and supervisor alike. The injection of innovative ideas into the market rests on the industry's ability to test new ideas beyond tried-and-tested models, learn from mistakes, find solutions that work, and eventually offer them on a sustainable basis. The perfect solution is not achieved at the first trial. It is thus important that supervisors adopt proportionate supervisory approaches that do not unduly prevent new ideas from being implemented. The following are some perspectives that the insurance supervisors could consider:

1. **Giving room to test new innovations:**

    - **Allowing case by case pilots and promoting long-term strategy for pilots.** More than a decade ago, pilots in inclusive insurance have provided crucial lessons learnt to design valuable and sustainable products. There should be room for pilots on climate risk insurance, but it is essential to have a strategy beyond the conclusion of the defined pilot phase[52]. Markets where small and unscalable pilots have been widespread are showing signs of being tired and therefore mistrust in these solutions is becoming prevalent. If pilots are considered successful, a strategy to scale up and transform these into regulated product offerings on the market may be necessary. If the pilot is not successful, a strategy to wind up the pilot in an orderly manner, protecting any remaining customer interests, would be necessary. Supervisors may also have to manage impact on consumer trust in insurance in order to avoid consumer apathy to future insurance initiatives.

51 (University of Cambridge - Institute for Sustainability Leadership, 2019) (Swiderek & Wipf, 2014)

52 See the IAIS Issues Paper on Index Based Insurances, Particularly in Inclusive Insurance Markets (June 2018) for a discussion on regulating index insurance and managing pilots.

- **Allowing regulatory sandboxes.** In the InsurTech space, an increasing number of supervisors are implementing this by way of regulatory sandboxes[53]. Sandboxes initiatives give space to practitioners to innovate but in a structured and contained way in order to ensure consumer protection is not unduly compromised. Some supervisors also use 'thematic sandboxes'[54] that are scoped to advance specific, focused policy objectives. Whether supervisors choose to have a centralised, broad sandbox or a thematic sandbox, it is important that the respective sandboxes are streamlined and do not create more regulatory confusion or resource constraints that further impede the ability of supervisors to respond to innovation.

- **Promoting innovation hubs.** Innovation hubs are another common innovation strategy deployed by financial regulators. Where regulatory assessment criteria or expectations are not clear, it can cause the perception that supervisors are not open to innovation or transparent. One critique put forth by the industry in the A2ii survey is that the supervisor has "too much discretion" in approving or rejecting products. Innovation hubs provide a clear signal and a formal platform for the industry to clarify regulatory requirements surrounding their proposed innovation directly with the regulator. The Financial Conduct Authority (FCA) of the United Kingdom (UK), pioneer of the regulatory sandbox, found that such contact has reduced the time and cost of getting innovative ideas to market.

- **Improving product approval times.** Long turnaround times also delay the implementation of projects, pushing up operational costs for practitioners. Such an experience can dissuade insurers from innovating.

- **Using flexible regulatory instruments.** Similar to digital insurance models and InsurTech, CRI innovations evolve very rapidly. A regulatory framework is unlike to exhaustively cover all innovations that are taking place and those to come. Therefore, supervisors are encouraged to strategically deploy the regulatory instruments available to them in a manner that still gives them some flexibility to respond to innovations. For instance, a definition that is written into primary legislation, thus requiring parliamentary approval, will likely require lengthy processes to change. However, a definition written in a regulatory framework or a circular can be more flexible, as supervisors have the authority to amend these regulations themselves. Supervisors could push for a broad provision in the insurance law (such as explicitly recognising index insurance), but provide specifications and details in regulations or circulars issued by the supervisor.

2. **Being open to new frontiers in insurance, while harnessing the old:**

- **Index insurance.** In El Salvador, Guatemala, Kenya, and other countries, supervisors had allowed index insurance pilots to take place despite lack of a specific

53 Regulatory Sandboxes are schemes set up by supervisory authorities that offer the potential for any eligible firm to participate in the sandbox and enable companies to test innovations in a market pursuant to a plan agreed and monitored by the supervisor. Innovation Hubs are a dedicated point of contact for firms to raise enquiries and to seek non-binding guidance on regulatory requirements and expectations surrounding FinTech. From various sources; see the summary of the 2018 IAIS-A2ii-MIN Consultative Forums, InsurTech – Rising to the Regulatory Challenge.

54 See https://www.cgap.org/blog/growing-trend-financial-regulation-thematic-sandboxes

regulation on index insurance at that time. The experience and evidence gained from the pilots guided and catalysed the eventual enacting of such regulations in some jurisdictions. Different approaches have been adopted to regulate index insurance around the world, with differing risk appetites[55]. The main challenges identified by supervisors regarding index insurance have been the application of the indemnity principle in the context of basis risk issues and the existence of insurable interest. Considering these legitimate concerns, in June 2018, the IAIS published the Issues Paper on Index Based Insurances, Particularly in Inclusive Insurance Markets in order to provide guidance to supervisors on how to apply a proportionate approach to index insurance and the A2ii produced a paper on the topic called Index Insurance: Status and Regulatory Challenges. Supervisors may wish to consider these guidelines and the approaches adopted in other regulatory frameworks when confronted with index insurance products in their jurisdictions.

- **New boundaries on what can be insured and who has an insurable interest.** CRI product innovation will see boundaries to the traditional concepts of insurability and insurable interest being pushed. For instance, the insurance industry has been testing new approaches such as insuring natural ecosystems that promotes resilience and provides key services to people. This is the case of the Insurance for Reef Restauration in Mexico, where the insurance industry together with the Natural Conservancy, the Mexican state government, the Cancun and Puerto Morelos Hotel Owner's Association are sharing the costs to protect the coral reef by creating a solution to protect a stretch of the Mesoamerican Reef[56]. Furthermore, it is important to consider the cascade of losses generated by natural disasters in the short, mid and long term, and the myriad of entities and individuals that could be affected. This implies the design of products covering not only direct and immediate losses, but also indirect and consequential losses caused by natural disasters in the short, mid and long term. Similarly, the cascade of losses involve a wide range of entities or individuals who could have an economic interest to protect themselves against those losses, therefore they could have an insurable interest.

- **Access to comprehensive range of insurance cover.** Covering risks other than climate risk and natural disasters for the unserved and underserved also builds resilience. Having a wide range of insurance cover that protects against other risks will help vulnerable individuals, SMEs, smallholder farmers, and households be more resilient as a whole, therefore potentially being less severely impacted in the face of climate shocks. Many supervisors in different jurisdictions have long been adopting proportionate approaches to develop broad access to insurance, as summarised in the paper Proportionate Regulatory Frameworks in Inclusive Insurance: Lessons from a Decade of Microinsurance Regulation by the A2ii. There are

55 The use of index insurance products (weather index, satellite index or area yield) in Africa and Asia is widespread, as it is seen as an appropriate alternative to address one of the most important constraints in reaching scale; the need for individual claim assessments. In Africa, 62% of the insurance schemes are index insurance solutions, and 14% are hybrid solutions that mix components of index and indemnity insurance. In South and East Asia, 64% are index insurance solutions and 14% are hybrid. In Latin America, index insurance products only represent 39% of the agriculture schemes. In that sense, advances in technology, such as satellite imagery, blockchain, creative weather stations, amongst others, are paving the way towards more innovative approaches in providing climate risk insurance. Despite this emergence of index insurance products in certain regions, index insurance products are not widely recognised by regulatory frameworks.

56 (Tercek, 2018)

several papers issued by the IAIS and the A2ii that provide guidance to supervisors to enable responsible market development, such as the IAIS Issues paper on Conduct of Business, the IAIS Application paper on Regulation and Supervision in Inclusive Insurance Markets and the Application Paper on Product Oversight in Inclusive insurance.

- **The potential of traditional property insurance products.** Besides specific innovative CRI for the unserved and underserved, traditional property insurance products that are available in the market also offer an opportunity. These products could be accessible to the generally unserved and underserved population, by being linked with mortgages in the context of social housing projects, or could be provided as business coverage to small and micro entrepreneurs or smallholder farmers.

- **Meso-level solutions.** As set out in **Box 1**, CRI is implemented as well via meso-level entities, such as local government offices or private sector entities such as MFIs. Developing and implementing such schemes is often a multi-stakeholder effort, and critically dependent on the buy-in of meso-level institutions. However, insurers or whichever party initiates the CRI solution may not have an avenue to engage the meso-level institution, particularly if it is a government organisation. Likewise, the meso-level institution might be looking to implement a CRI solution, but might not have an avenue to engage the industry or identify appropriate insurance experts. Therefore, depending on the scope of the supervisor's mandate and capacity, supervisors could also be in a position to 'matchmake' the different stakeholders by initiating, supporting or championing efforts to implement meso-level CRI schemes.

- **Linkages between macro, meso and micro level solutions.** The development of sovereign risk pooling mechanisms has also encouraged the development of linked solutions, such as the ARC Replica. This has opened an interesting debate about the synergies between macro, meso and micro solutions[57].

3. **Enable a wide range of distribution channels and delivery strategies.** Distribution is a key cost component of insurance business. In the past decade, much of the innovations that have made insurance more affordable and inclusive has been in distribution. CRI is no exception, in that innovative distribution strategies will be critical to finding cost-efficient climate risk solutions. Some regulatory aspects affecting distribution of CRI are as follows:

   - Ability to leverage a wide range of aggregators and transactional platforms. Alternative distribution channels such as MFIs, Savings and Credit Cooperatives, Cooperatives of Producers, NGOs, networks of MFIs and cooperatives, input providers and other agribusiness companies, Mobile Network Operators (MNOs), TSP, remittances companies, amongst others, are essential for the development of CRI. However, the A2ii Survey found that the majority of respondents consider that there are still regulatory barriers that hinder their use as distribution chan-

57 (Fernandez, Dubreuil, Gotora , & Kyuma , 2018)

nels or transactional platforms. Supervisors are invited to adopt proportionate approaches to allow distribution channels and innovative transactional platforms and consider the IAIS guidance, such as the IAIS paper on Conduct of Business in Inclusive insurance published in 2015.

- Digitalisation of the insurance value chain. The use of technology is extremely critical in many aspects of the insurance value chain of CRI. For instance, technology plays a vital role in innovative products such as index insurance, where advanced modelling is required to design reliable indexes and remote sensing is key to ensure scale. Technology is also required to geo-localise clients, communicate with them constantly, enrol them, collect premiums and provide payouts in a timely and transparent manner. Thanks to technology Pula provides weather-index insurance products using satellite data, registers consumers using a mobile app, provides essential information to farmers via the app and automates payouts via text messaging. However, in order to achieve that level of digitalisation of the insurance value chain a myriad of regulatory requirements may need to be enabled: electronic payments, automatisation of claims settlement, online dispute resolution mechanisms, electronic signatures, electronic contracts, electronic KYC verification, calculation platforms, amongst others. It is important that such regulations do not disproportionately hamper the feasibility of implementing such models and at the same time protect effectively consumers. Supervisors are invited to consider the guidance of the IAIS Issues Paper on Conduct Business and the IAIS Application Paper on the Use of Digital Technology in Inclusive Insurance.

- Bundling can strengthen demand and awareness for insurance, but also comes with consumer protection risks[58]. However, bundling may be a necessary practice in CRI as insurance. Indeed, 90% of the index insurance products mapped by the Syngenta foundation are bundled with loans, agricultural inputs or the provision of valuable information to clients, such as weather and price information[59].

- Risk-pooling to purchase insurance collectively. Governments have created sovereign risk pooling mechanisms facilities that had led to positive outcomes such as: (i) improving the conditions of insurance and reinsurance contracts by insured parties, by reducing premiums because of the reduction of variability of total losses experienced by the group and by enabling profit retention by the pool; (ii) providing a platform to increase their disaster risk manage knowledge, capacity amongst members and the adoption of more holistic approaches of risk management; and (iii) facilitating business aggregation that would not be independently appealing for the insurance industry. This risk pooling approach is currently being replicated at the local level in the Philippines with the "Philippines City Disaster Insurance

58 A lesson from inclusive insurance is that bundling with tangible services can reduce the intangibility of insurance for consumers, thus raising awareness and provide a stronger value proposition. However, it also creates the risk that consumers are 'nudged' into buying coverage they do not need or are not aware that they have paid for the insurance cover. There a few types of bundling strategies: (i) bundling of CRI with other financial services, such as the provision of insurance with loans and savings; (ii) bundling different type of life and non-life products in order to offer "protection packages"; (iii) offering insurance linked to value added services that could be of more value for consumers, such as the provision of remote weather and price information, inputs, health care, mobile phone services, technical assistance, amongst others; and (iv) allowing in-kind compensations so pay-outs are more tangible and visible.

59 (ISF, 2018)

Pool" (PCDIP), where 10 cities decided to join efforts to reduce the costs of insurance premiums by diversifying risk and supporting the first layer of loss caused by typhoons and earthquakes via pool reserves[60]. Similar approaches could be adopted by networks of MFIs, cooperatives, NGOs, Community Based Organisations (CBOs), amongst others. The networks could aggregate the business of all members enabling risk diversification and therefore premium reduction. They could also create pool reserves that could support the first layer of losses, which would be consistent with the adoption of a layered approach to disaster risk transfer that would build resilience.

2.1.2 Demand

One of the main obstacles for insurance take-up are demand constraints and they generally relate with awareness, appeal, trust, culture, behavioural biases and affordability. Indeed, none wakes up one day wanting to purchase an insurance product[61]. In this section we will explore how supervisors could stimulate demand for responsible and affordable CRI products that are needs-based.

BOX 3

TO COMPEL OR NOT TO COMPEL? THE POTENTIAL OF MANDATORY INSURANCE

In order to cope with an important demand constraint, in Turkey the government decided to introduce a risk transfer scheme where earthquake insurance was made compulsory for all residential buildings that fall within municipality boundaries. In 2006, it was found that insurance penetration of catastrophe insurance in the country had tripled compared to 2000, covering approximately 2 million Turkish homeowners (16% of the insurable housing stock) and making TCIP the largest insurance programme in the country[62]. Similar approaches have been adopted in India, where there is compulsory for farmers who take up loans to purchase the partially subsidized crop insurance scheme Pradhan Mantri Fasal Bima Yojana (PMFBY) offered by AICI. In September 2019, the Ministry of Finance of Morocco announced plans to implement a mandatory insurance against disasters, including natural disasters and terrorism, in 2020[63].

Supervisors could explore the possibility of advocating for laws to make insurance mandatory in critical CRI areas. This could be at the micro or meso level. While this helps to immediately ensure that the target population is covered by insurance, mandatory insurance has its drawbacks and challenges. Mandatory insurance has a long history in other insurance lines, such as motor insurance and health insurance. From

60 (Benson, 2019) (ADB, 2018)

61 Or maybe unless the need was recently perceived… This is the case of Turkey, where sales of earthquake insurance have shot up after a 5.8 magnitude earthquake struck Istanbul on 26 September 2018. (Middle East Review, 2019)

62 (Gurenko, Lester, Mahul, & Oguz Gonulal , 2006)

63 (Middle East Insurance Review , 2019)

these experiences it has been observed that such mandatory insurance could stifle innovation in the particular product line. Policyholders may also not be aware of the benefits and how to make a claim. If product features are standardised by regulation and offered by multiple insurers, it could lead to premium undercutting. Yet if offered through a centralised fund or entity, it is also operationally challenging to ensure that servicing and claims are properly carried out.

Stimulate insurance awareness as part of a more comprehensive approach of risk management awareness. Many insurance supervisors today take a leading role in running insurance awareness programmes[64] , many of which as part of broader financial inclusion and financial literacy strategies. This role is in line with ICP 19.13.4, which provides that the supervisor should promote consumers' understanding of insurance contracts.

There is evidence that insurance awareness effectively stimulates demand, however, it is important to be cautious and realistic, because better awareness and knowledge of insurance does not always translate into higher demand. For instance, there are studies showing that consumer education seems to stimulate demand for index insurance but has no effect on health insurance. At the same time there are studies showing that consumer education does have an important impact on renewals more than first-time sales, as clients might test a product but not renew it if is confusing.

Enhance industry capacity to develop needs-driven products for the underserved in order to boost demand based on genuine needs. The reality is that many insurance products today do not respond to the needs and particularities of consumers. In the inclusive insurance field, this situation is likely compounded, as insurers have even less information on and interest in the needs of the low-income and underserved[65]. A challenge that is persistently expressed by the industry is that they do not know that market, and they do not have data and tools to design needs-driven and affordable products[66]. Supervisors could address this information gap in a few ways:

- **Funding national market studies.** The Colombian supervisor, the SFC, collaborated with Banca de las Oportunidades, a governmental entity taking the lead on financial inclusion, to offer national demand studies to inform the understanding of the state of financial inclusion in the country.

64 Examples include: Microinsurance awareness programmes in Guatemala or the Philippines; or by establishing legal obligations on supervised entities to create insurance awareness programs for consumers such is the case of Colombia and South Africa; or by leading the implementation of PPP to provide impactful insurance awareness programs such it is the case of Ghana, Peru and India. Specifically, in Ghana, the National Insurance Commission, jointly with the insurance sector have designed a comprehensive insurance awareness tailored to different segments of the population and available in 36 languages. In Peru, the Ministry of Agriculture with the support of the private sector has also taken the lead to design financial education material on the agriculture insurance programme that is subsidised by the government.

65 According to a recent study of Capgemini, less than a quarter of businesses feel their insurance coverage is adequate (The Economist, 2019). A critical finding from the microinsurance landscape studies of Africa and Latin America is that insurance against natural disasters is highly needed but the product offering is still poor (Microinsurance Network and Minich Re Foundation, 2018) (Microinsurance Network, Munich Re Foundation and Microinsurance Centre, 2015).

66 (A2ii and Microinsurance Centre , 2017)

- **Investing in open-source datasets and infrastructure.** Supervisors could create "technical public goods" such as models for certain perils, or platforms providing weather data and historical losses that is publicly available to all.

- **Adopting more robust monitoring and evaluation processes.** For examples, supervisors could collect segregated data and key performance indicators on CRI, inclusive insurance, or low-income targeted CRI to monitor product performance from a consumer outcome point of view. Going a step further, supervisors in the UK and Australia have also started publishing comparative data on premiums and claims to incentivise healthy competition among insurers and promote informed consumer decisions.

Take steps to introduce wider cost efficiencies in the insurance market that ultimately translate to affordability. As elaborated in section 2.1.1.2, there are many regulatory aspects in which supervisors could make changes in order to enable more cost-efficient distribution models. In order for the cost savings to ultimately benefit consumers however, any reduction in insurers' expenses needs to translate to lower premiums. A potentially more direct way of reducing the out-of-pocket premium expense for consumers is through consumer taxes. Supervisors are also in a position to engage with policymakers on tax requirements for insurance products against climate risks and natural disasters. In Nicaragua for example, agriculture insurance is exempted from VAT. In Malaysia, resulting from annual budget proposals by the regulator to the Ministry of Finance, inclusive insurance products were made exempt from stamp duty in 2018.

2.2 Championing Climate Risk Insurance

Insurance supervisors are often in a position to shape the contribution of the insurance industry towards building resilience. They can do so not only by the adoption of proportionate regulatory and supervisory approaches. Supervisors, in their unique position as a bridge between policymakers, the insurance industry and consumers, are best-placed to navigate the different stakeholders, both in terms of aligning the interests of the different sectors as well as lending policy and technical expertise. Considering this, supervisors can play a key role to articulate the national dialogue around CRI in order to ensure awareness, recognition and coherence in the design and implementation of CRI interventions. Supervisors can be the champions of CRI and be the piece of the puzzle that will ensure alignment amongst all stakeholders. This role is extremely important in order to build awareness of CRI among policymakers and support them in achieving public policies. Supervisors can also help overcome the lack of communication and coordination amongst policymakers and between the public and private sector.

Build internal expertise and capacity on CRI. In the A2ii Survey on CRI (**Figure 3**), the industry indicated concerns that supervisors may not have sufficient expertise on CRI. Such a concern may lead to the industry preferring to avoid innovation in order to avoid risk of potential sanctions, holding protracted discussions with the supervisor or onerous product approval processes. Supervisors are therefore encouraged to proactively tap into the vast amount of discussions and expertise circulating on CRI today. Participation in international capacity building events on CRI and disaster risk management generally can help supervisors gain exposure on best practices in other jurisdictions. Supervisors can also leverage the experience of peers

through regional and global associations such as ASSAL, the IAIS and the A2ii. If resources allow, such opportunities are ideally attended by the different levels of staff and departments to ensure that the knowledge is transferred throughout the organisation. In turn, supervisors can share the newfound expertise among the local industry and policymakers by initiating their own platforms for dialogue.

Engage with policymakers on the role of insurance in other areas of public policy. By spreading awareness and leading discussions at the political and policymaker level on how insurance contributes to policy goals and the SDGs, supervisors can ensure that any opportunities to embed insurance in policy and regulatory measures are recognised and taken up. Such policy goals include: disaster resilience, social security, poverty alleviation, gender inequality, environmental protection and general economic development. Supervisors are also encouraged to raise awareness among fellow authorities and policymakers on their expertise and interest in insurance. They can also promote that awareness in the context of financial inclusion committees, or any other multi-stakeholder platform at the governmental level. This ensures that they are consulted when insurance-related initiatives arise, but is also helpful for government entities that are exploring but are not familiar with insurance. This in turn strengthen the outcomes of supervisors' own goals to have more friendly insurance regulatory environments, and more broadly "more friendly regulatory environments and policies".

Actively participate in local platforms aiming to design and implement CRI interventions. Dialogue and coordination between private and the public sector entities is key in order to develop good ideas and ensure responsible and appropriate implementation. Developing a CRI initiative involving the government often entails the setup of a platform or taskforce that brings together all the relevant stakeholders: ministries of agriculture, environment, finance and disaster risk reduction; local governmental entities, the industry, consumer representatives, technical experts and research institutions, amongst others. It is important the supervisor participates in such a taskforce, or is at least kept up to speed on progress and able to intervene where necessary. In engaging with these platforms, supervisors may also wish to ensure that the insurance industry is duly consulted.

Supervisors can proactively draw on the wider role of the insurance industry as risk management experts. As elaborated in section 1.2, the role of the insurance industry as risk underwriters can go beyond insurance product development. A recent study of the Geneva Association showed that currently the insurance industry is actively sharing its risk knowledge, modelling and pricing expertise with a wide range of public and private sectors, in order to harness risk awareness and promote risk-based decision making[67]. Supervisors have intimate knowledge of the technical capabilities of insurers, given they supervise them and approve new CRI products. At the same time, supervisors would likely be involved in multi-stakeholder platforms that have been set up to focus on climate risk. Supervisors are thus in the best position to identify and rope in the industry expertise that is needed to contribute to developing national CRI solutions.

67 (Golnaraghi, 2018)

CONCLUSION

Natural disasters are continually pushing vulnerable individuals like Begum into poverty and despair. Because of climate change, the severity and frequency of losses will worsen over time, and Begum's situation will become more and more precarious. This impacts her life in the short, medium and long term, but also her district and more widely, the whole country. Economic growth and poverty alleviation will continue to be set back. Even though insurance is not a silver bullet, it is part of the puzzle that can help Begum and her community become more resilient against natural disasters and therefore change her fate. Nonetheless, currently the insurance gap is very wide and despite the much-discussed benefits of insurance, no suitable insurance products are available for Begum.

The global insurance industry is aware of the problem and there is an increasing willingness to contribute to build resilience by: (i) offering valuable insurance products to Begum; (ii) integrating holistic risk management approaches so their products support Begum in reducing her risk exposure, preparing better before the shock, for instance through an early warning system, or mitigating losses suffered; and (iii) contributing their expertise to initiatives beyond the immediate insurance industry, to help society better understand risk; for instance, by supporting the Kurigram district in developing thorough vulnerability models and hazard-proof structures.

Supervisors are in a unique position to make vulnerable individuals like Begum more resilient to natural disasters and circumstances today call for urgent action. The active involvement of supervisors can indeed make a significant difference. Firstly, they can harness the role of the insurance industry by enabling innovations that lead to the supply of responsible and appropriate insurance solutions that benefit Begum, while pushing the insurance sector to apply integrated risk management approaches. Secondly, supervisors could stimulate demand for needs-based CRI products. Thirdly, supervisors can act as catalysts of CRI in their countries, by making policymakers aware of the potential of CRI and liaising to ensure that interventions are valuable and sustainable.

This discussion on supervisors' role in building resilience is just starting and this paper provides a roadmap to continue the discussion. Supervisors are invited to keep exploring innovative ways to make the most of their role and discuss these amongst their peers, the public and private sectors. It is important that supervisors keep abreast of market developments relating to climate risk and remain active contributors in the discourse. All this could lead to identifying other ways and mechanisms to reduce the insurance protection gap, so Begum can be protected through insurance and sound climate risk management solutions.

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