Opportunities for Regional Cooperation in Disaster Risk Financing
The Economic and Social Commission for Asia and the Pacific (ESCAP) serves as the United Nations’ regional hub promoting cooperation among countries to achieve inclusive and sustainable development. The largest regional intergovernmental platform with 53 Member States and 9 associate members, ESCAP has emerged as a strong regional think-tank offering countries sound analytical products that shed insight into the evolving economic, social and environmental dynamics of the region. The Commission's strategic focus is to deliver on the 2030 Agenda for Sustainable Development, which it does by reinforcing and deepening regional cooperation and integration to advance connectivity, financial cooperation and market integration. ESCAP's research and analysis coupled with its policy advisory services, capacity building and technical assistance to governments aims to support countries’ sustainable and inclusive development ambitions.

Opportunities for Regional Cooperation in Disaster Risk Financing
Acknowledgements

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Foreword

Disaster risk is outpacing disaster resilience in Asia and the Pacific. It is the region most affected by natural disasters and accounts for half of global economic losses. By 2030, annual losses in the region are expected to be over $160 billion, which is close to 0.6% of the region’s GDP, up from 0.1% in the 1970s. Yet only 8% of disaster losses are insured in the region. A large protection gap is growing as disaster losses increase. Financing is essential if we are to mitigate and cope with disaster risk. Donors, governments and multilateral development banks have gradually scaled up financial assistance for disaster risk reduction and climate change adaptation. ESCAP has provided funding for over a decade through its multi-donor Trust Fund focused on supporting an Indian Ocean tsunami early warning system, and strengthening disaster and climate preparedness. Innovative financing mechanisms that help transfer risk also have a key role to play. Risk financing instruments such as catastrophe bonds, parametric insurance and contingent credits, have emerged as a corollary of investments in disaster risk reduction that are a necessary part of comprehensive disaster risk reduction efforts.

A series of innovations in the past few decades have revolutionized the cost-effectiveness of disaster risk financing mechanisms. Innovations such as catastrophe risk modelling, the creation of parametric insurance instruments for risk transfer, and the convergence of traditional reinsurance markets and broader global financial markets have made it possible to transfer larger volumes of natural hazard risk to global markets more cheaply and effectively. Using these innovations, multi-state risk pooling is scaling up social safety nets and supporting governments’ short and medium-term response to disasters for vulnerable countries around the world.

The opportunities and challenges offered by sovereign risk pools in Asia and the Pacific are the focus of this study. Disaster risk financing is burgeoning. The Pacific Catastrophe Risk Insurance Company (PCRIC), set up as a multi-national sovereign risk pool in 2012, has been instrumental in the recovery process following Tropical Cyclone Pam. The risk pool provided immediate relief to Vanuatu with a payout of US$1.9 million, and helped the country with a rapid liquidity injection in the immediate aftermath of the disaster, demonstrating the importance of disaster risk financing as an integral part of sustainable and inclusive development.

Setting up risk pools and expanding the use of risk transfer mechanisms in Asia-Pacific requires strong commitments and coordination among countries. As a convening platform, ESCAP can bring value to the coordinated uptake of disaster risk financing mechanisms in the region. Highlighting the challenges and opportunities for both the public and private sectors, the study notes the multiple roles ESCAP can play - including providing access to a Trust Fund, hosting a technical assistant facility, providing a clearing house for knowledge and expertise, and coordinating donor contributions. This study should help the region’s policy makers and strategists understand the opportunities in disaster risk financing better and take the action needed to build resilience and achieve our Sustainable Development Goals to leave no one behind.

Dr. Shamshad Akhtar
Under-Secretary-General of the United Nations
and Executive Secretary, United Nations Economic
and Social Commission for Asia and the Pacific
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1 Introduction
This chapter provides an introduction to global activities in the area of disaster risk financing. In particular, it summarizes the current state of play of sovereign risk transfer in Asia-Pacific and discusses the potential catalytic role that the Economic and Social Commission for Asia and the Pacific (ESCAP) could play in expanding the use of sovereign risk transfer to build resilience across the region.

In subsequent chapters, the following core themes will be discussed: Chapter 2 presents the global landscape and relevant experience in sovereign risk financing; Chapter 3 presents key innovations in disaster risk transfer which have underpinned its recent expansion in the development space; Chapter 4 explores the feasibility of sovereign risk financing and potential models for its wider use across the Asia-Pacific region; and Chapter 5 outlines the resources available to ESCAP, exploring how they might be best deployed to support sovereign risk financing.

1.1 Background

This section provides a brief overview of disaster risk financing. It discusses the growing prominence of risk transfer in the development space from the perspective of policy and innovation.

1.1.1 Recognition in economic development policy

As a development financing tool, disaster risk financing is gaining more recognition for its ability to build resilience to external natural catastrophe shocks, as a result of its three key pillars:

- Improving risk assessment and awareness
- Developing coordinated and pre-agreed post-disaster plans
- Implementing effective financial protection measures

Much of this momentum has been driven by successful sovereign risk pools in the Caribbean (Caribbean Catastrophe Risk Insurance Facility, CCRIF-SPC), Africa (African Risk Capacity, ARC) and the Pacific (the Pacific Catastrophe Risk Insurance Company, PCRIC). These sovereign risk pools have effectively helped governments safeguard national budgets and protect the lives of their citizens against the impacts of disaster.

In some cases, these sovereign risk pools have catalysed sub-sovereign initiatives at the meso-level (e.g. loan portfolio default protection for lending institutions, especially for low-income populations and sectors particularly exposed to natural disaster risk such as agriculture) and at the ‘micro’ level (e.g. weather index micro-insurance). Other meso-level and micro level risk financing schemes have been piloted around the world, though with mixed results and have often faced challenges in scaling up and/or not meeting client or sponsor expectations.

The post-2015 development agenda has cemented disaster risk financing as an integral and necessary part of achieving sustainable and inclusive development. This is evidenced across multiple instruments: the recognition of financial protection as a key element of resilience in the Sendai Framework for Disaster Risk Reduction; the mainstreaming of resilience to climate and other natural disaster shocks in the Sustainable Development Goals and its supporting financing mechanisms laid out in the Addis Ababa Action Agenda; the recognition of insurance as a key mechanism to managing “loss and damage” under the Paris Agreement; and the prominence of structured risk management approaches, including risk transfer, as a tool to address the global humanitarian system as discussed at the World
Humanitarian Summit. With an expected increase in the impacts of climate change on the frequency and severity of extreme weather events, disaster risk financing has become fully mainstreamed into the development agenda.

The adoption of the InsuResilience targets by the G7 under the German presidency in 2015 further added to this momentum, with G7 countries committing an additional 400 million people to be directly or indirectly covered by climate risk insurance. Under the German presidency of the G20 in 2017, the InsuResilience concept was expanded. At the twenty-third Conference of Parties to the UN Framework Convention on Climate Change held in Bonn, the InsuResilience Global Partnership\(^1\) was launched, bringing together multiple strands into a single framework for supporting the broader use of risk transfer to build resilience to climate and other natural disaster risk.

1.1.2 Innovation

A series of innovations has revolutionised the management of natural catastrophe risk in the past three decades. This comes after almost no change in the insurance industry and global risk marketplace for the last three centuries.

These innovations have resulted in a huge increase in the appetite for catastrophe risk transfer in both developed and developing countries, which has led to a reduction in the price of catastrophe risk transfer. This is particularly the case when catastrophe risk transfer is appropriately packaged. Three key innovations are described below:

- The development of catastrophe risk modelling in the late 1980s and its mainstreaming in the 1990s brought together natural hazards science, engineering and actuarial mathematics to completely change the way that natural disaster risk was understood, managed and priced.
- The creation and deployment of parametric insurance instruments, which began as a limited suite of weather derivatives serving the energy and agricultural sectors in the United States and a few other places, became available for almost all natural hazard risks globally. This enabled insurance penetration to reach countries and regions where traditional indemnity products had not gained traction – at least not for natural disaster risk. Parametric insurance instruments are now also being tested for forecast-based financing tools\(^2\) that could trigger financial flows to support near-term preparedness in advance of a disaster occurrence.
- The convergence of traditional reinsurance markets with broader global financial markets through what is generally termed alternative risk transfer (ART) and the emergence of catastrophe risk as an investable asset class through insurance-linked securities (ILS).

As a result of these innovations, it is now possible to transfer larger volumes of natural hazard risks to the global markets more cheaply and efficiently (in terms of frictional costs) than ever before and arguably with less uncertainty about future pricing and capacity.

Figure 1 illustrates these pricing and capacity developments in Asia and the Pacific with a steady increase in capacity alongside a historically volatile, but now low pricing.

Figure 1: Guy Carpenter Asia-Pacific limit and rate-on-line (ROL) indices

Source: Guy Carpenter.  
Note: Premium divided by amount of coverage (maximum payout) used as a metric of insurance pricing.

Figure 2 presents two global views of pricing of catastrophe risk. Figure 2a is based predominantly on traditional reinsurance market pricing and almost exclusively on indemnity insurance transactions. Figure 2b is based on ILS transactions, some of which are parametric in nature. Notable features include the substantial reduction in volatility of global risk pricing (Figure 2a in particular), and the historically low pricing of catastrophe risk (both Figures.)

Figure 2a: Global property catastrophe rate-on-line (ROL) index – 1990 – 2016

Source: Guy Carpenter

All data measured at 1/1 *Preliminary
In summation, the following observations can be made:

- Disaster risk financing, as a critical element of holistic natural hazards risk management, has emerged over the past 10 – 15 years in the global economic development space. It has also been consolidated into an area of intense focus and support in the post-2015 development agenda.

- The global risk market has become an accessible and highly competitive avenue to transfer natural catastrophe risk, triggering the development of innovative mechanisms to facilitate this at the regional, national and sub-national levels.
1.2 Sovereign risk financing in Asia and the Pacific

The Asia-Pacific region is highly vulnerable to natural disasters. As highlighted in the ESCAP Asia-Pacific Disaster Report 2015\(^3\), in the 10 years leading up to 2014, 1.4 billion people were affected by natural disasters. This amounts to 80 per cent of the global total, with damage estimated at half a trillion dollars or 45 per cent of the global total.

While some governments across the region have developed sophisticated disaster risk financing strategies to address the inherent vulnerabilities of their economies and the lives and livelihoods of their people, many have made little or no progress. These countries are increasingly at-risk as their economic development continues to build value without the required resilience.

The more developed economies have achieved higher penetration rates using traditional as well as alternative risk transfer mechanisms in the private sector across businesses and individuals (Figure 3). Asia overall maintains a huge protection gap and therefore represents an opportunity for expanding the use of risk transfer to build resilience.\(^4\)

**Figure 3**: Non-life insurance penetration as a percentage of gross domestic product in 2015

![Non-life insurance penetration as a percentage of GDP](image)

*Source: OECD Global Insurance Statistics.*

Figure 4 illustrates the size of the protection gap in Asia where both the risk and the gap are greatest.

One significant step taken at the national level over the past decade has been the creation and operationalization of multi-national sovereign risk pools. Fifteen Pacific Island States have access to such a pool. However, thus far the take-up rate has been limited with only five States currently participating. The risk transfer volumes have also been very modest.

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Building one or more sovereign risk pools in Asia has been a key component in discussions around enhancing the resilience of national economies to natural disaster risk in a cooperative and cost-efficient way.

**Figure 4: Size of the protection gap globally in early 2017**

![NATURAL DISASTER RISK in USD Billions](image)

Source: AIR Worldwide.

### 1.2.1 Introduction to sovereign risk pools

Catastrophe risk pools provide a mechanism for States to participate in risk transfer transactions in a cost-efficient and mutually supportive way. For developing countries, there are a number of advantages to transferring natural disaster risk through a pool, including:

- **Diversification of risk** – Covering each country's risk in a pool to the 1 in 100-year level, for example, requires much less capital than if each country were to cover the same level of risk on an individual basis. Diversification occurs across multiple perils as well as geographical areas. Diversification does not reduce the risk (measured by the average annualised or expected loss), but does reduce the capital requirement to cover the full risk spectrum.

- **Shared costs of programme development and operations** – Catastrophe risk models are complex and expensive. They are best developed and maintained on a regional or global level based on consistent standards to manage costs. Insurance operations require specific technical capacity and support services, which are more cost-effective when performed in a pool of States rather than among individual States.

- **Large reinsurance transaction size** – This creates a better proposition to global markets, thus reducing cost.

The advent of parametric insurance created an opportunity to consider alternative mechanisms to cover government assets and operations for natural catastrophe risk. While many governments self-insure, few do it in the context of a holistic risk management framework where the costs and benefits
Opportunities for Regional Cooperation in Disaster Risk Financing

of such an approach are compared to alternatives. Developing countries, and in particular the small island States, face severe consequences from large disasters that can impact economic growth both in the short-term and for many years afterwards. Economic consequences could be mitigated through better preparedness and earlier action. Economic analyses suggest at least a 4 to 1 benefit to early action across a range of natural disasters.

When Hurricane Ivan swept through the Caribbean in 2004, the consequences were devastating. Beyond the heavy loss of lives and livelihoods, governments across the region struggled to cope with the scale of the impact. Recovery was greatly delayed due to a lack of financial resources. By the end of that year, heads of government of the Caribbean Community (CARICOM) formally requested the World Bank to look into an insurance scheme to support rapid government response after natural disasters – a business interruption insurance for States. Over the next two years, a consulting team devised and implemented the CCRIF concept; and the CCRIF was launched in 2007 with 16 State members, including all those impacted by Hurricane Ivan.

With donor grant capital and a willing reinsurance market providing additional support, CCRIF was able to underwrite US$600 million of risk using a parametric approach. Under this scheme, there would be risk-based pricing and rapid objective payouts, ensuring fairness and transparency across the pool of participating countries. Although technically considered an insurance transaction, such a multi-national programme could be viewed as a joint reserve mechanism with contribution levels selected by individual participants, and a rules-based access mechanism to ensure in the long term that each participant received the same portion of the joint reserve through payouts and relative to the premium (contribution) made.

By combining resources, this approach could provide a much higher quantum of available capital over an individual sovereign contingency fund. It could also bring discipline to the management and protection of the funds so that they were there when really needed.

Since the launch of CCRIF in 2007, risk pools have been developing, and now potentially cover close to 100 countries for multiple perils – the majority of which are developing nations with many amongst the most vulnerable. CCRIF itself has expanded to include countries in Central America (including the Dominican Republic and Panama). The African Risk Capacity (ARC) was launched in 2012, issuing its first insurance contracts in 2014. In the Pacific, the PCRAFI programme facilitated insurance transactions for a number of Pacific Island States starting in 2012, and on 1 November 2016 issued its first policies from a capitalised underwriting entity, PCRIC making it a true sovereign risk pool.

Alongside development of the multi-State pools, the FONDEN programme in Mexico has also brought similar risk transfer tools to the federal government, introducing greater financial and operational efficiencies to Mexico’s comprehensive disaster risk management programme. Mexico issued its first sovereign catastrophe bond in 2006, providing parametric coverage for major hurricane or earthquake impacts; and in 2011, it supplemented the catastrophe bond coverage with an indemnity programme. The recent World Bank catastrophe swap transaction for the Government of the Philippines is designed to facilitate the creation of an integrated sovereign risk financing programme operating at several levels within the Philippines, and replicates in some ways, the FONDEN programme approach in Mexico.

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5 A catastrophe bond is a capital market instrument, in which the investment risk is in the form of insured losses in a defined portfolio. The coupon paid reflects the level of insurance risk and is therefore equivalent to the premium in a normal insurance contract, with partial or full bond default being equivalent to an insurance payout.
1.3 A facilitating role for ESCAP

With this landscape of high and growing risk, the large protection gap between that risk and what is covered by risk financing tools, and the demonstrated commitment of leaders in the region to address this issue, the time is ripe for action towards expanding the use of risk transfer tools across Asia and the Pacific. Experience from other regions shows that action needs to begin predominantly at the national level. A multi-State risk pooling approach has many advantages, particularly as a first step and catalysing influence.

For multiple countries to pool their risks, a system of trust and transparency is needed. Each country must be reassured the system is fair, and what they receive from the pool over time will be based on what they put in. As a regional, inter-governmental convening platform for Asia and the Pacific, ESCAP is uniquely positioned to facilitate the development of such a pooling mechanism.

As observed in the Secretariat’s note to the fifth session of the Committee on Disaster Risk Reduction of ESCAP held in Bangkok in October 2017, ESCAP has three key advantages in serving as a focal point:

- Convening power as the most inclusive inter-governmental platform in Asia and the Pacific
- Experience in delivering knowledge products and services through regional cooperation
- Management of the existing Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness

Later in this report, after global good practices and lessons learned have been assessed and the benefits of regional cooperation analysed, the possibility of ESCAP setting up a regional facility for risk pooling will be further explored.

This could be done by creating a dedicated Multi-Donor Trust Fund which could provide both risk capital and supporting knowledge products and services.

The analysis will also include a review of other initiatives on disaster risk financing in Asia and the Pacific region, including within the UN system (and its related multi-lateral development banks), through individual or groups of bi-lateral donors, and other regional entities.

In closing, it is important to emphasise that sovereign risk pooling in Asia-Pacific requires coordination of both initiatives and partners to ensure that the architecture which evolves is appropriate to the needs of the region. As will be later described, in all three multi-national risk pools currently operating, the technical expertise resides in a private sector vehicle, created to serve the public-sector clients of each facility. The “sponsoring” regional agency in all cases will be the one best able to bring countries together, and to present the economic case for risk financing in an accessible way. None of these sponsoring regional agencies have inherent insurance expertise; indeed, providing the “supply” of sovereign risk insurance is well tested. Instead, they helped to create demand by providing a regional platform for building capacity and mutual trust, and this is the key to successful sovereign risk pooling.

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2
Good Practices and Lessons Learned in Risk Financing
Risk financing can be defined as the deployment of financial tools and processes to mitigate the impact of events, which have a negative effect on financial flows required to support an enterprise. Risk financing may be arranged in advance (ex ante) or on the occurrence of an event and identification of the need (ex post). The former is generally considered both more efficient and more effective than the latter, and the remainder of this section deals primarily with ex ante risk financing.

Ex ante risk financing builds resilience in a business, organisation or government, all of which operate more effectively and efficiently when budgets and capital flow are not disrupted by external shocks beyond the control of the enterprise.

2.1 Introduction to risk financing

The most common form of ex ante risk financing is insurance. In simple terms, insurance is a transaction in which a risk holder (individual or business) pays a relatively small premium on a regular basis to a risk-taker (insurance company) who is then contracted to provide a relatively large payout should a covered event (e.g. car accident, natural disaster) occur.

In indemnity insurance, the size and nature of the payout is directly linked to the actual loss, so that the crashed car is replaced, or the damaged home is repaired back to its prior state. In parametric (also called index-based) insurance, the amount of the payout is dictated by an objective measure of the causal event (e.g. the speed of the wind in a cyclone), though in more sophisticated modelled loss parametric mechanisms, such objective measurement is translated into an actual loss estimate.

In all forms of insurance, analysis of the risk is required to set a fair and viable price. An insurance company must on average collect enough premium to cover the payouts it expects to make, plus its operating costs less investment income it may make on the capital it holds.

If exposed to particular types of events which can impact multiple policy-holders simultaneously (called covariant risk), insurance companies have to hold enough capital to pay all of the claims at once, so risk – and payouts - cannot be spread through time. Holding such potentially large amounts of capital is expensive, so insurance companies holding covariant risk use reinsurance, which is insurance for an insurance company against catastrophe events. In turn, reinsurance companies operate and spread their risk globally, lessening both the geographical and time-concentration of the risk they hold.

Other forms of ex ante risk financing include contingency funds, pre-defined budget re-allocation, contingent credit lines and alternative risk transfer mechanisms such as catastrophe bonds. Catastrophe bonds, known as “cat bonds” package risk such that it can be held within the large capital market space rather than just in the restricted reinsurance space.

Risk financing generally takes a layered approach (Figure 5), providing flexibility through a range of mechanisms to respond to events with different levels of severities, requiring different quanta of financing required on different timescales (Figure 6). It has been shown that making relatively small amounts of financing available and deploying them quickly can significantly reduce the overall negative financial impact of a natural catastrophe event.
Figure 5: Simplified concepts of layering of financial tools to manage sovereign risk of different frequencies and severities

Not all instruments serve the same purpose and governments can take a layered approach to financial protection by combining instruments with different characteristics.

Such risk layering ensures that cheaper sources of money are used first, with the most expensive instruments used only in exceptional circumstances.


Figure 6: Resource requirements through the different phases of post-disaster actions

2.2 Risk financing in the public sector

Traditionally, the public sector has not engaged in risk financing, or at least not in an overt way. In the developed world, sovereign balance sheets are considered robust and the risk sufficiently dispersed in space and time to allow for full risk retention. Risk reduction, including preparedness, has generally been viewed through a humanitarian lens with economic aspects left mainly un-addressed.

However, over the past several decades this has increasingly changed. Three key factors have driven this change:

- An increase in risk globally which is outpacing broader economic development due to concentrated population growth in urban areas and along coasts, and increased volatility of weather as a result of climate change.
- A recognition that in the development arena, and for small and fragile economies in particular, disaster shocks cannot necessarily be financed internally due to tight fiscal space and high debt burdens amongst other things. This is increasingly the case for developed countries as well.
- Awareness that financing the current humanitarian response system is not sustainable. Greater attention needs to be given to the efficiency of the ex post financing model and to the equitable sharing of risk between the donor and recipient communities.

Governments have always played a central role in emergency relief, recovery, and reconstruction in the aftermath of disaster. During and directly after a disaster, governments and in the case of developing countries, international partners provide emergency relief to the affected population, which can range from food aid distribution to the drainage of water in flood zones. Such disaster response expenditures require immediate access to liquidity and swift mobilisation and targeting of funds to mitigate the negative impact of disasters on people and assets. If public infrastructure is damaged (and not insured), governments will also need to pay for significant reconstruction costs.

Disasters also have long-term macroeconomic impacts that can affect States’ budgets, debts, and development pathways. Unbudgeted response expenditure has a high opportunity cost, disrupting long-term investment strategies across all sectors. For example, Hurricane Ivan in 2004 led to an economic damage equivalent twice the annual GDP in both Grenada and the Cayman Islands. In Grenada, budget reallocations and new debt created fiscal challenges that will likely be playing out for 15 years.

2.2.1 Impact on the most vulnerable

For developing countries, we must also look beyond the headline economic shock. Statistics on macroeconomic and fiscal impacts do not reflect the indirect impact that disaster losses can have on poor and marginalized communities, nor the longer-term impact on human and economic development. Often, the absolute economic losses of the poorest households are small relative to the wealthy, and thus the impact on poorer communities can be overlooked or underestimated in the analysis.

A recent World Bank report found that when accounting for impacts on well-being, natural disasters cost the global economy US$520 billion (or 60 per cent more than usually reported) and forced some 26 million people into poverty every year8.

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In respect of households and communities, the impact of disaster and climate shocks on poorer communities may be more stark. The impact of disasters on human capital (nutrition, education, and health) can severely affect households’ earning potential. Moreover, within a household, the impacts of disaster can be distributed unevenly. For example, mortality rates as a result of disasters are higher among women; and negative impacts on nutrition and school performance disproportionately affect girls. Women and infant girls often bear the brunt of both the direct and indirect impacts of disasters.

2.2.2 Risk financing as part of a comprehensive risk management system

A comprehensive approach to disaster risk management is needed to build resilience to the impact of external shocks. This requires not only an understanding of how to reduce hazard, exposure and vulnerability, but also an established coordinated and pre-agreed post-disaster plans backed by effective financial protection measures. Not all disasters and crises can be prevented, so governments must be ready to manage the impact of residual risk. To manage and mitigate the impact of increasingly complex threats, it is critical to move away from traditional humanitarian support systems financed with funds raised after an event towards an approach that emphasises preparedness based on national response systems.

In their recent book, Clarke and Dercon outlined key elements for an effective approach to disaster preparedness and crisis response. Such a comprehensive approach is increasingly being recognised as best practice, and integrated into the design and implementation of risk financing solutions across a range of development actors and programmes. This approach is comprised of three elements:

- **A coordinated plan for post-disaster action agreed to in advance.** A single, credible disaster response plan that explicitly defines stakeholder responsibilities (who or what will be protected against what, and who will pay for what) supported by a clear decision process, clarifying risk ownership amongst the relevant actors – State government, development and humanitarian partners, individuals, households and communities.

- **A fast, evidence-based decision-making process.** Identifying in advance a set of objective and transparent rules to guide decision making that are grounded in early warning and post-disaster data and information.

- **Pre-planned financing to ensure that the plan can be implemented.** Funds to cover the implementation of a plan are critical (including before the need materialises, through forecast-based-financing), as well as ex ante risk financing to ensure funds are available quickly when, and only when, they are needed. This also binds partners to respond in the agreed way.

2.3 Risk financing for development

A growing number of donors, development partners and international financial institutions are supporting financial protection solutions in developing countries, recognising the benefits of a proactive approach to managing the financial impacts of disasters within a broader risk management framework.

The post-2015 development agenda has embraced disaster risk management and financial protection as key elements for building resilience and securing development gains:

- **The Sendai Framework for Disaster Risk Reduction** adopted by UN Member States in 2015,
guides global efforts to prevent new and reduce existing disaster risk through 2030, highlighting financial protection as a key element of resilience.

- **The Addis Ababa Action Agenda** adopted in July 2015, sets the level of ambition for financing the Sustainable Development Goals (SDGs). Climate and disaster resilience are mainstreamed across the SDGs and their associated targets, ensuring that global development priorities over the next 15 years will integrate climate and disaster risk management considerations.

- **The Paris Agreement of the UN Framework Convention on Climate Change**, which entered into force in October 2016, recognises (under Article 8) the need for comprehensive risk assessment and management including the use of insurance to address loss and damage from climate change.

- **The World Humanitarian Summit**, held in May 2016 discusses a structured risk management approach including risk financing as an important tool in fixing the global humanitarian system.\(^\text{11}\)

The G20 Ministers of Finance first discussed the benefits of financial protection against disasters as part of the agenda during the Mexican presidency of the G20 in 2012. As part of their G7 presidency in 2015, Germany sponsored InsuResilience, an initiative to expand climate risk insurance coverage to an additional 400 million people in developing nations by 2020; and as part of their G20 presidency in 2017, Germany continued to play a leading role.

The Vulnerable 20 (V20) Ministers of Finance, representing a group of countries that share a vulnerability to climate and disaster risks, is also promoting joint risk financing solutions to protect against the financial shocks of climate risks.

At the 2017 UN Climate Change Conference in Bonn (CoP23), the InsuResilience Global Partnership was launched, bringing together the G20 and V20 initiatives into a single platform for the promotion, funding and implementation of climate risk insurance solutions.

### 2.3.1 Key features of an effective disaster risk financing solution

Experience to date\(^\text{12}\) has indicated that there are a number of features critical to effective deployment of risk financing in the development space:

- **Risk information**: Can the chosen instrument help countries understand and price their risk? Does it incentivize investments in risk reduction and preparedness? Does the instrument support risk-based pricing?

- **Cost of capital**: How cost effective is the instrument in accessing financial resources post disaster, both in absolute terms (i.e. the cost of delivering US$1 worth of disaster response) and relative to other instruments available? Recent work by the World Bank\(^\text{13}\) with the support of DFID provides a robust quantitative framework to evaluate cost-effectiveness.

- **Timeliness**: Can the selected instrument make funding available at the right time?

- **Discipline**: How well can the instrument support post-disaster spending discipline, accountability and transparency?

- **Ownership**: How well can the instrument clarify risk ownership? Is the entity paying the cost (e.g. premium) of the instrument also the entity that bears the risk?

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Most of the examples of risk financing in developing countries have been implemented at the State level to cover response and early recovery needs for both sudden and slow onset events. In almost all cases, engagement has been with individual governments, though usually as part of a pool of countries in a given region acting together to bring economies of scale, operational efficiency, and risk diversification benefits.

Some middle-income countries have moved beyond broad national coverage to address risk financing for specific sectors (e.g. agriculture), specific losses (e.g. public housing) and specific investments (e.g. large infrastructure projects). As well, in some cases risk financing has been used to fill gaps in the private insurance market, such as mandating coverage for homeowners against earthquake damage.

Case studies of prominent examples of risk finance used in development / humanitarian response are briefly described in the following sections.

### 2.3.2 Global risk pools

Since the launch of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) in 2007, risk pools have been developed to address multiple perils, potentially covering more than 70 countries in Africa, the Caribbean and Central America and the Pacific. Many of these countries are amongst the most vulnerable in the world.

The CCRIF has since been expanding gradually and now includes countries in Central America (e.g. the Dominican Republic and Panama). The African Risk Capacity (ARC), launched by the African Union in 2012, issued its first insurance contracts in 2014. In the Pacific region, a programme facilitated insurance transactions for a number Pacific Islands States starting in 2013, and in November 2016 issued the first policies from the newly created catastrophe risk pool, the Pacific Catastrophe Risk Insurance Company (PCRIC).

As of November 2017, these three programmes (CCRIF, ARC and PCRIC) covered 24 countries, providing an aggregate coverage limit of over US$800 million. In all cases, these programmes worked directly with Ministries of Finance as the policyholders. Key activities from each of these pools are summarised below.

#### Caribbean Catastrophe Risk Insurance Facility

The Caribbean Catastrophe Risk Insurance Facility (CCRIF) started as a Cayman-domiciled captive insurer serving the 20 Member and Associate Member States of the Caribbean Community (CARICOM) by providing parametric earthquake and tropical cyclone insurance policies. CCRIF is wholly owned through a purpose trust, operating for the benefit of the participating countries. It reconstituted in 2014 as a segregated portfolio company (SPC), enabling the setting up of separate underwriting pools with differentiated capital (cells). CCRIF now also offers an excess rainfall policy, and includes a cell dedicated to underwriting risk in the COSEFIN countries (Central America plus the Dominican Republic and Panama).

CCRIF offers modelled loss type parametric policies, in which a hazard parameter (or a set of parameters) is the sole variable input to a catastrophe risk model that is locked at the start of the insurance period. The hazard variable is then converted to impact and then to loss. The CCRIF models use a consistent gridded exposure dataset across all perils they cover, and attempt to capture the large-scale impacts of natural catastrophes on national and local economies.

The policies of CCRIF are highly customisable with pricing based solely on the quantum of risk transferred (measured by expected loss and variability of those losses). Some limitations are put in place to constrain the risk transfer transaction such that it targets that portion of the risk profile where
such insurance provides a cost-effective solution. This generally provides coverage which triggers every 10 years or so and ensures larger payouts for larger events up to a limit at the 1 in 100-year to 1 in 200-year range. Earthquake policies tend to have less frequent trigger levels due to the lower frequency of damaging earthquake events, while excess rainfall policies have a more frequent trigger level, but transfer a smaller quantum of risk.

CCRIF is designed as a business-interruption type coverage, providing rapid liquidity to States to deal with the immediate, unbudgeted needs in the weeks and months following a disaster. Given the risk inherent to any parametric insurance contract, CCRIF coverage may not be well-suited to cover specific infrastructure damage or long-term rebuilding programmes. But, it can provide the financial leeway to put in place more cost-effective financing mechanisms for full post-disaster recovery. CCRIF does not place any formal constraints on the use of payout funds. But, it does increasingly monitor the use of payout funds to foster knowledge-sharing of best practices, and as a source of evaluation data.

CCRIF utilises the international reinsurance markets only when and to the extent it is efficient to do so, in order to leverage its own capital to provide much greater aggregate coverage than would otherwise be the case. The objective nature of the parametric contracts used for risk transfer, along with the diversification of the portfolio, allow for attractive pricing from international markets, including capital markets.

CCRIF offers single-year contracts on a parametric basis with risk-based pricing that is constant across the whole pool. Coverage for each peril is priced and purchased separately, and the portfolio of risk underwritten by CCRIF is reinsured in the international markets to ensure that premium pricing to participants captures the benefits of diversification.

The business targets for CCRIF include maintaining efficiency in operations, capturing a risk-appropriate return on its capital, upholding a commitment to pay claims even for the most extreme (e.g. 1 in 1,000-year) events, and offering the lowest possible premium pricing to its clients. As capital has been accumulating, CCRIF has been lowering the long-term premium pricing metric and has also used short-term premium discounting (implemented on an equal basis across the pool) to maintain participation and provide best value to its client countries.

During September and October 2017, CCRIF paid out almost US$60 million to client countries impacted by Hurricanes Irma and Maria and affected by heavy rain associated with another tropical system. All of the payouts made to the eight different countries were done within 14 days, providing the ultimate proof of concept for CCRIF during its tenth anniversary year. It had fully delivered on its mandate since Hurricane Ivan in 2004 - the last major multi-island hurricane impact in the region. As the Caribbean begins to rebuild, and looks to further enhance resilience, CCRIF will play a central role in delivering on both its existing, but also new products and services to the sovereign nations it serves.

### African Risk Capacity

The African Risk Capacity (ARC) is comprised of two entities, a treaty-based international organisation, the ARC Agency (a specialised agency of the African Union formed at the direction of the Ministers of Finance) and an affiliated insurance company, ARC Ltd, domiciled in Bermuda as a mutual insurer. ARC Agency is ultimately under the control of its Conference of Parties, which appoints a Governing Board, and its operations are undertaken by a Secretariat. ARC Ltd has its own board of seven Directors, and operates on commercial principles as the underwriter of policies to ARC Agency member states.

ARC Ltd offers parametric insurance policies with respect to the key climate risks faced by African States. This currently includes drought and cyclone but will soon expand to include flood. The drought policy uses rainfall as the variable input parameter, and the in-house modelling platform of ARC, Africa RiskView (ARV), converts that rainfall into an affected population estimate (in low rainfall situations)
Opportunities for Regional Cooperation in Disaster Risk Financing

ARV has been designed as a transparent and customisable tool (a "glass box" as compared to the traditional "black box" catastrophe risk models), used by member to both appropriately model their risk profile as a basis for purchasing insurance and as an early-warning tool. For cyclones, ARC has leveraged the experience of CCRIF to offer a very similar product to exposed countries in the southwest Indian Ocean, including an early-warning component embedded in ARV (which CCRIF also offers to its clients, though not in a constant modelling platform equivalent to ARV). The flood product was still in development at the end of 2017, and will likely be a hybrid coverage capturing both food security needs and direct asset and livelihood impacts.

The loss and payout calculations of ARC Ltd are completed on a similar timescale as that of CCRIF. However, a significant additional step is required prior to the payout being made. States receiving a parametric payout from ARC Ltd are required to develop, and obtain certification (from a group of experts and peers) on a final implementation plan (FIP) for the use of the payout funds before a payout can be made. This FIP builds on an Operation Plan, which also must be certified (again after both technical and peer review) prior to the original purchase of the insurance coverage. While this approach tends to make payouts from ARC occur on a timescale of a few weeks, it is critical to ensuring that the most vulnerable communities are able to fully access the benefits of early action. There is a 4.4:1 cost-benefit ratio to early action through ARC versus the traditional international appeals-based humanitarian response mechanism. Thus, it can be said that ARC is contributing significantly to risk reduction through this government-led action.

ARC Ltd is capitalised through interest free loans from two bi-lateral development partners, DFID on behalf of the United Kingdom government and KfW Development Bank, through a Mauritius-domiciled Trust, on behalf of BMZ and the German Government. ARC Ltd operates on mutual principles such that any underwriting profit is used to accumulate capital to the ultimate benefit of the premium-paying clients. ARC Ltd has a substantial investment portfolio and very low operational costs. It has also established highly cost-efficient access to the international risk markets, providing capacity to underpin expansion of ARC's insurance programme, alongside the capacity building in risk understanding, early warning and contingency planning, all of which are critical to ensuring the long-term sustainability of the programme.

ARC Ltd clients and governments select coverage parameters in a similar way to CCRIF participants; some limits are placed on risk transfer parameters, and generally ARC Ltd policies are constructed to pay out every 3 to 5 years commensurate with the high frequency of droughts in many African countries. Trigger levels for cyclone and flood policies will be somewhat higher, covering risk in the 10 to 100-year return period range.

Pacific Catastrophe Risk Insurance Company

The Pacific Islands sovereign risk pool was originally set up as a series of World Bank coordinated risk transfer transactions for 5 Pacific Islands from a total of 15 covered by catastrophe risk modelling, all within the Pacific Community (SPC). The original Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) project began by building up an understanding of risk through compiling and databasing detailed exposure and vulnerability information as well as commissioning a probabilistic catastrophe risk model covering tropical cyclone and earthquake (plus tsunami) hazards.

Supported by a Japanese trust fund administered by the World Bank, risk transfer transactions were initiated with five countries in early 2012. The World Bank Treasury acted as an agent to pool and transfer risk to the international risk markets. Premiums for participating countries (except for the Cook Islands which joined later) were either heavily or fully subsidised from the trust fund.

By the time of the renewal of country insurance policies came up in November 2016, operations had
Opportunities for Regional Cooperation in Disaster Risk Financing

partly migrated to an insurance company, the Pacific Catastrophe Risk Insurance Company (PCRIC), owned by the PCRAFI Foundation. The PCRIC was formed in the Cook Islands under a decision made by the Ministers of Finance of the Pacific Island Countries (PICs) at the 2015 Forum Economic Ministers Meeting (FEMM).

When the 2017 renewal came around, PCRIC underwrote 100 per cent of the risk from the five participating countries. PCRIC then purchased reinsurance on the open market to cover some of that risk, with the remaining covered by capital provided by a multi-donor trust fund from a number of bi-lateral donors including Japan, Germany, the United Kingdom and the USA.

PCRIC continues to use the catastrophe risk model developed on a proprietary basis by AIR Worldwide, which is available via free license to participating countries. AIR Worldwide is externally, however only under a fee-based license. Parametric policies are settled on a modelled loss basis. Exposure data is available separately as part of a substantial GIS database managed by the Pacific Community (SPC).

By the end of November 2017, after almost six years of operation, PCRAFI / PCRIC had made payouts totalling US$3.2 million to two separate countries – one for cyclone and one for earthquake. As with the other sovereign risk pools, payouts flowed quickly (usually within 2 weeks) and directly to the national treasury. There were also some ‘soft’ restrictions on the use of funds and reporting back on that use.

2.3.3 Other risk financing modalities in development

Global coverage for non-State actors

While several actors in the development and humanitarian space have investigated the use of risk financing tools to manage their liabilities more efficiently and effectively, there is only one programme that is operational – the Pandemic Emergency Financing Facility (PEF) of the International Development Association (IDA) of the World Bank Group. The PEF launched in mid-2016, although actual risk transfer didn’t take place until mid-2017. It was created to provide rapid financing to IDA member countries facing potential infectious disease epidemics. Depending on the level of preparedness, resources from PEF (a small fully funded pot of finance above which sits a parametric risk transfer window) would flow either to the country or to pre-qualified international partners to implement response.

Other initiatives which have yet to reach fruition include:

- Several large international NGOs wishing to access reliable financing for rapid humanitarian response.
- UN agencies investigating the use of insurance instruments to leverage existing donor funding streams, including WFP (through the Replica Coverage program of ARC14) and OCHA (related to extending the capacity of CERF15).
- Several bilateral donors investigating the use of risk financing to reduce volatility in their humanitarian response budgets.

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Opportunities for Regional Cooperation in Disaster Risk Financing

Several middle-income countries have developed risk financing solutions that could be applied in Asia-Pacific. These include:

- **The Natural Disasters Fund (FONDEN)** in Mexico provides comprehensive risk management services at the federal level while also supporting the federated states. It is funded by an annual levy on the federal budget ensconced in law. It includes risk financing for federal infrastructure and a contribution to state infrastructure, which supports public housing, delivering post-disaster rebuilding assistance (via a rules-based process) and protection through an indemnity insurance policy. FONDEN also had until 2016, and then again from mid-2017, a higher layer of parametric insurance protection for earthquakes and cyclones via a catastrophe bond. One tranche of this bond triggered in full for an earthquake offshore close to Oaxaca State on 7 September 2017.

- **The Turkish Catastrophe Insurance Pool (TCIP)** in Turkey is a government-backed private market insurance programme for homeowners in earthquake-prone areas of the country. Though run wholly within the private sector, the insurance programme was capitalised with support from development actors, and the government enacted a legal requirement for coverage to be purchased by those owning property in the most exposed areas. TCIP is supported by the international reinsurance and capital markets.

- **Philippines Government Service Insurance System (GSIS) Programme** in the Philippines builds on six years of intensive partnership with the World Bank, which resulted in the preparation of the first national catastrophe risk model by AIR Worldwide, and the adoption of a disaster risk finance strategy by the Department of Finance. The programme provides the local currency equivalent of US$206 million in coverage on a parametric basis against losses to national government assets from major typhoons and earthquakes, as well as coverage to 25 participating provinces against losses from major typhoons. GSIS is a government-owned insurance agency with the World Bank Treasury acting as the reinsurer, and ultimately transferring the risk of GSIS via retrocession to a panel of international reinsurers.

The two key lessons to be gleaned from these three examples of national risk financing programmes are:

(a) One instrument is unlikely to be capable of multiple uses; as such, careful design is critical to ensure that the specific target problem is addressed in the most efficient and effective way by the designed instrument deployed as the solution.

(b) National risk financing programmes take time to build, and building must be incremental.

### 2.3.4 Recent advances in risk financing for development

Recently, there have been a number of advances supporting the expanded use of risk financing tools in the development space. The most important is the concept of concessional insurance, as a subset of broader concessional financing delivered by multilateral development agencies and other...

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development actors. This idea has been floated as a means of achieving greater penetration for risk financing tools and products, which in turn will provide greater resilience for States, communities and ultimately individuals.

While the details are still being worked out on how concessional insurance might be delivered and who might be eligible, some preliminary concepts are being discussed within the framework of the InsuResilience Global Partnership, particularly around what key features of a concessional insurance programme should be in place given experience to date.

- Insurance proceeds must finance pre-agreed preparedness plans, and implementers of the plan must be held accountable for delivering assistance quickly and efficiently.
- Insurance must be part of an integrated risk management programme, which clearly identifies what is being covered and to what extent. Risk transfer should be complementary to investments in risk reduction.
- Insurance products should be part of an economically sustainable and fair insurance system that is able to respond to both large and small disasters. Products should be designed to reliably pay out when needed.
- Information (e.g. risk assessments) related to risk financing should be fully transparent, and interactions with the private markets should be on an open and competitive basis.

Another significant advance has been in the area of risk understanding. Risk assessment and modelling has broken out of its highly specialised and often proprietary box, and is now becoming more widely deployed across the risk management space, in a more accessible and transparent manner. An example from the Asia-Pacific is the ASEAN-UN Joint Strategic Plan of Action on Disaster Management 2016-2020, AADMER17 “AWARE”, Priority Programme 1. The programme is led by ESCAP and focuses on enhancing risk assessment and improving risk awareness of the ASEAN member States.

2.4 Risk financing activities in the Asia-Pacific

This section attempts to capture some of the key developments in sovereign parametric insurance and risk pooling in the Asia-Pacific region over the past few years amongst various multilateral and some bilateral institutions. The following review is by no means comprehensive. It tries instead to identify key documents and projects, providing intelligence on the most recent work by each of the main institutions involved. It highlights some of the various seminars and workshops that have been held in the region on this subject. It does not further discuss PCRIC or the recent Philippines transaction, both described earlier in this chapter, but does cover at a higher level the recent activities initiated under the InsuResilience Global Partnership.

It is perhaps useful to highlight that despite the significant amount of activities surrounding sovereign risk financing for development in the region, and the recognised need for risk transfer to take place (as described in Chapter 1), the actual volume of sovereign natural disaster managed through risk transfer each year has been minimal.

2.4.1 Asia-Pacific Economic Cooperation

In 2013, the OECD produced a report entitled “Disaster Risk Financing in APEC Economies”\(^\text{18}\), which proposed three roles for a disaster risk financing strategy: disaster risk management, financial protection of all segments of society, and financial management of government exposures. The report also presented a number of priorities for strengthening financial resilience in APEC economies, including improved data availability and quality, capacity building and raising awareness, enhancing coordination amongst countries, and promoting insurance and risk markets.

The 2013 OECD report was summarised in a presentation during the 2015\(^\text{19}\) APEC meetings in the Philippines. Further discussions continued at that 2015 APEC meetings with presentations from ASEAN and ADB (see below), and then at the APEC meetings in Peru in February 2016\(^\text{20}\) and in Vietnam in February 2017\(^\text{21}\).

The OECD work in this area for APEC, and for the G20 during Mexico’s chairmanship in 2012\(^\text{22}\), culminated in the recently published “OECD Recommendation on Disaster Risk Financing Strategies”\(^\text{23}\). This document provides useful guidance across a number of areas relevant to the role that ESCAP could play in this region. Specifically, the report makes the following recommendations:

- Establish a strategy under the leadership of Ministers of Finance or other relevant national authority for managing the financial impacts of disasters.
- Promote comprehensive risk assessment processes.
- Support the effective management of the financial impacts of disasters by all segments of the population and economy, and encourage the development of risk transfer markets for disaster risks.
- Effectively manage the financial impacts of disasters on public finances.

APEC has a technical working group on this issue\(^\text{24}\), for which the Philippines is the current chair. An update on progress in the area of disaster risk financing was provided to Ministers of Finance at the 24th APEC Meeting in Vietnam in October 2017\(^\text{25}\), with the following recommendations:

- Improve the capacity of natural disaster forecasting as a basis for enhancing the quality of budgeting in response to disaster risks, and develop quantitative tools for assessing the disaster risks and developing a set of databases on disaster risks.
- Develop a strategy on natural disaster risk financing and improve the legal framework on...

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natural disaster risk management in order to enhance implementation of policies regulating disaster risk financing.

- Diversify the financial resources in disaster risk management, including State budget, insurance, special financial funds and other resources.
- Develop the disaster risk insurance market in order to create active financial sources which help to lessen the burden on government budget and transfers risk into markets.
- Strengthen cooperation to foster better sharing of information and experiences among APEC member economies and international organizations.

2.4.2 Association of Southeast Asian Nations

In 2011, ASEAN began implementing a roadmap on Disaster Risk Financing and Insurance (DRFI). An update was given at the 2015 APEC meeting in the Philippines. The coordination committee met early in 2017, with proceedings summarised in a short press release. At the time of this writing, Phase 1 of the DRFI Roadmap and Programme had been completed, and Phase 2, which will focus on the considerations and pre-conditions for establishing a regional risk insurance pool in the region, had not yet begun.

The ADRFI Programme is tasked to implement the roadmap as well as the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme. These two complementary regional policies highlight the importance of integrating disaster risk management into the economic development agenda to build resilience against natural disasters and climate change.

An early key outcome of the ASEAN DRFI activities was the publication of a report based on work undertaken by the World Bank and GFDRR, entitled “Advancing Disaster Risk Financing and Insurance in ASEAN Member States: Framework and Options for Implementation” which was accompanied by substantial Technical Appendices. This work largely draws on prior and, at the time, ongoing work by the World Bank, which has already been discussed above in this Report.

The most recent ASEAN events were a training course held in Manila in May 2017 and a partners’ meeting in Jakarta in mid-September 2017 to build momentum for Phase 2 of the ADRFI Programme both events were supported by the German government via GIZ. Representatives of the KfW Insurance Solutions Fund made a presentation at the Partners’ Meeting on an early-stage concept for an emergency response risk pool linked to the AHA Centre (see below.)

2.4.3 Asian Development Bank

ADB first supported technical assistance in this area via the Natural Catastrophe Risk Insurance Mechanisms for Asia and the Pacific project which started in 2008 and eventually finished in 2012.
A preparatory conference was held with a "launching’ report". One of the spin-off projects was to look at urban risk in Indonesia, the Philippines and Viet Nam, while another was the formation of the Integrated Disaster Risk Management Fund and a Working Group on Disaster Risk Finance.

ADB have also supported a project in Bangladesh and are supporting several initiatives in the Philippines that include looking at options for a multi-city catastrophe risk pool which has just started.

ADB provided a brief update on DRF at the 2015 APEC Summit in the Philippines. ADB and the ADB Institute have co-sponsored several seminars and workshops with OECD. These have included seminars held in September 2015 in Manila and Kuala Lumpur, producing a summary report and a third regulator workshop, as well as another seminar in June 2016 in Tokyo.

The ADB Institute published a policy note on DFRI in January 2017 laying out the current ADB position. The policy note recognises States’ role in strengthening financial resilience to disasters through the use of disaster risk financing tools, and argues that both public and private sectors need to be involved in solutions, with the private sector as the ultimate holder of at least some of the risk.

2.4.4 World Bank

The World Bank has been very active in the area of disaster risk financing in Asia-Pacific. It has an ongoing programme in Viet Nam including risk modelling and DRFI strategy discussions. An earlier evaluation of the status of DRFI was prepared.

A report on DRFI in Indonesia in October 2011 entitled “Advancing a National Disaster Risk Financing Strategy – Options for Consideration” laid the framework for various activities, although these focussed at the national rather than multi-national level for Indonesia. A similar report was produced for Sri Lanka and Pakistan.

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The World Bank is also supporting risk modelling work in three countries (Lao PDR, Myanmar and Cambodia) that have signed an MoU to form a Southeast Asia Disaster Resilience Insurance Facility. Planned technical support from the World Bank will be through country-specific projects that are in early stages of development under the umbrella of a Southeast Asia Disaster Risk Management Project.

### 2.4.5 Other related work

Various UN agencies, including FAO, WFP, UNDP and ISDR, are increasingly supporting disaster risk financing work as part of their own mandates to build resilience and manage risk more effectively, and consistent with the Sustainable Development Goals. However, none has recently undertaken specific disaster risk financing work directly relevant to this review.

The Climate and Development Knowledge Network (CDKN), supported by the governments of the United Kingdom and the Netherlands, commissioned a project in Pakistan to investigate the use of disaster risk financing tools\(^\text{46}\), though again this was focused on the national level.

Recent work specifically on risk pooling included a study funded by the Rockefeller Foundation and GFDRR by the World Bank\(^\text{47}\). The United Kingdom through its Department for International Development commissioned a scoping study in late-2016, though the results of that study have not been publicly released.

KfW Development Bank launched its Insurance Solutions Fund in October 2017\(^\text{48}\) with an early focus was on Asia-Pacific, particularly identifying both regional and national risk transfer opportunities. An early concept note maps out ideas for a pooled fund, leveraged by risk transfer, to support enhanced financing for the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre\(^\text{49}\)). The AHA Centre currently operates on a skeleton budget and is required to raise funds ex post to facilitate appropriate rapid response and early recovery across all member countries. ESCAP played a key role in the formation of AHA Centre, and could provide valuable support in this new initiative to utilise ex ante financing tools to deliver even greater post-disaster response capabilities across ASEAN.

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3

Innovations in Disaster Risk Financing
This chapter provides insight into the technical aspects of risk transfer for States, elaborating in some depth on innovations which have now made risk transfer more accessible to developing and middle-income countries.

### 3.1 Risk transfer modalities

The different types of insurance instruments that play a role in enhanced natural disaster resilience for States may be classified into four broad groups:

- Direct sovereign disaster risk transfer
- Agricultural insurance
- Property catastrophe risk insurance
- Disaster microinsurance

#### 3.1.1 Direct sovereign disaster risk transfer

Direct sovereign disaster risk transfer instruments aim to increase the financial response capacity of governments in the aftermath of natural disasters, while also protecting long-term fiscal balances through the use of risk transfer instruments such as insurance and insurance-linked securities (e.g. catastrophe bonds, catastrophe swaps and weather hedges). Building a risk financing strategy, governments are often better served by retaining the bulk of their natural disaster risk, using risk transfer mechanisms to either manage the extra volatility within their budgets or access immediate liquidity after a disaster.\(^{50}\) However, as described in Chapter 2, there have been significant developments in expanding the role of insurance beyond the provision of short-term liquidity – the primary purpose of the three existing risk pooling mechanisms – to enable, for example, the scaling up of social safety nets and crowding-in of partners to support governments’ short and medium-term response.

#### 3.1.2 Agriculture insurance

Agricultural insurance has traditionally been a tool deployed by States to address the contingency liability it holds to serve rural populations, particularly those exposed to extreme weather events. According to Mahul and Stutley, “agricultural insurance is one of the financial tools agricultural producers can use to mitigate the risks associated with adverse natural events – events that climate change may render more frequent and more severe in the future.”\(^{51}\) These tools provide cover for catastrophes impacting crops and livestock, and have been most effective when applied within a framework for agricultural risk management. This is briefly described below.

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Holistic agricultural risk management

Insurance is one among a number of tools for mitigating the negative impact of disaster risks. It should be applied within a broader framework for agricultural risk management alongside other financial tools for the mitigation of disaster impacts, such as physical mitigation measures, and institutional and market development initiatives.

The World Bank promotes a proactive approach to the financial management of agricultural production risk, viewing it as one component within a comprehensive disaster risk management strategy. This approach focuses on addressing the impact of residual risks remaining after cost-effective risk mitigation techniques (e.g. irrigation, pest treatments) have been implemented. Under this framework, agricultural risk financing – insurance, credit and products to manage price risk (e.g. forward sales, futures contracts and options) – is presented as one of four key risk management pillars which include institutional capacity building, quantitative assessment of risks to agricultural production and agribusiness segmentation (Figure 7).

Figure 7: Framework for financial management of agricultural production risk

Source: World Bank

There are many types of agricultural insurance, but generally they can be classified into two broad categories: traditional crop insurance products, and index-based weather insurance products. Each of these categories is discussed below drawing on two resources produced by the Agricultural Risk Management Team of the World Bank. Traditional crop insurance

Traditional agricultural insurance relies on the principle of indemnity. The insurance product responds to an actual loss by providing the amount required to replace that loss. There are two broad types of traditional insurance:

- **Named Peril Crop Insurance (NPCI):** This type of insurance assesses losses that occur due to a specific peril(s) through field assessments. This makes it easy to determine actuarially-sound premiums, as long as historical weather series and loss data exist. However, NCPI is subject to moral hazard issues, which arise when insured parties alter their behaviour to increase the potential likelihood or magnitude of a loss. This can happen because farmers may not take appropriate precautions against crop damage if they are insured.
• **Multi-Peril Crop Insurance (MPCI):** This type of insurance establishes an insured yield as a percentage of the historical average yield. If actual yield is less than the insured yield, an indemnity is paid. Yield guarantee insurance is attractive to farmers since it covers drought, flood, high winds, and other naturally occurring weather damage, but it has a number of weaknesses:
  
  • It may be actuarially unsound, essentially covering highly spatially correlated and uninsurable risks.
  • In the case of plant disease and pest damage, it is hard to disentangle management failures from external factors.
  • The cost of normal premiums can be exorbitant. Government subsidies are therefore often needed to increase farmer participation rates, and the programme ends up being an income transfer scheme disguised as a risk management tool.
  • It can be subject to adverse selection, which occurs when the potential insured has better information than the insurer about the likelihood or magnitude of a loss, and thus uses that information to self-select whether or not to purchase insurance.
  • It can be subject to moral hazard.
  • It can be costly to administer.

**Index-based products**

Index-based products compensate farmers based on changes in an index (generally weather-related but also other factors) rather than an assessment of actual amounts of damage. The index acts as a proxy for yield, and hence changes in the index should reflect changes in yield. There are two types of index based insurance products:

• **Area Yield Index:** This type of insurance provides a payout based on realisation of an index highly correlated with farm-level yield short-falls. The indemnities are paid based on estimates of the yield in defined areas, such as a community administrative area. A threshold is established that is less than the expected area yield and indemnities are paid to all farmers whenever the realised area average is less than the threshold.

• **Weather-based Index Insurance:** The indemnity is based on realisation of a specific weather parameter measured over a pre-specified period of time at a particular weather station or via remote sensing. Payout occurs when the realised value of the index exceeds a pre-specified threshold or when the index is less than the threshold. This type of product is appropriate for highly correlated risks, and where there is a strong and quantifiable relationship between weather risk and yield loss.

The notable advantage of index based insurance over traditional indemnity-based products is its ability to provide farmers with disaster assistance quickly after the loss or damage has occurred. The farmer therefore does not have to wait until the claim has been verified, making this tool attractive to potential capital providers. The ability to pay out quickly has a particularly high value in certain settings, particularly the low-income sector. Hess, Wiseman and Robertson in their 2006 study in Ethiopia, found that $US1 made quickly available after a weather event could save as much as $US5 in prevented impacts.

53 Ulrich Hess, William Wiseman and Tim Robertson, “Ethiopia: Integrated Risk Financing To Protect Livelihoods and Foster...
On the other hand, an important issue to keep in mind when reviewing and assessing agricultural index-based products is basis risk. Basis risk is the potential mismatch between contract payouts and the actual loss experienced. This is the main disadvantage of index-based insurance products. Emerging research on the economic impact of basis risk has provided more insight into how to better design products, and highlights the need for effective benefit distribution mechanisms.⁴⁴

Weather index products are less susceptible to adverse selection⁵⁵ or moral hazard.⁵⁶ Monitoring costs are low, which can lead to more affordable premiums. Thus, they are often promoted as a very flexible instrument, well suited for low-income individuals and communities with limited resources in disaster-prone areas.

Besides the issue of basis risk, this type of insurance is limited by its heavy dependence on the availability of sufficient data for developing risk models of probable loss and is therefore often suited to regions or countries with long historical weather data series, good coverage by weather stations, and easy access to satellite imagery.

### 3.1.3 Property catastrophe risk insurance

Property catastrophe risk insurance (PCRI) policies cover disaster-related damage to physical assets or loss of income arising from damage to a physical asset. These insurance policies can take the form of household and contents insurance, or insurance cover for commercial and industrial assets (typically as an ‘all-risks’ policy). Loss of income and alternative living expenses can be covered although such policies are not as widespread. Underwriters tend to be selective in granting cover where disaster risk is high.

Although the industrialised countries of North America, Western Europe and parts of Asia-Pacific enjoy a high level of insurance penetration, many countries in Africa, Asia, Latin America and the Caribbean have limited access to non-life insurance, with hardly any catastrophe insurance available. State support for the development of more accessible property catastrophe risk insurance is a key element of holistic risk management, and may include subsidised premiums for low-income households along with regulatory and market reforms to provide incentives for take-up.

Risk Management Solutions and Lloyd’s (RMS & Lloyd’s) provides some key considerations in assessing the role of traditional property catastrophe insurance in climate change adaptation, in coastal areas in particular:⁵⁷

- Adaptation is key to ensuring future insurability. Risks arising from natural catastrophes are insurable, but adaptation measures are vital to maintaining the availability of affordable insurance, particularly for existing coastal properties. Adaptation methods could include elevating properties, reinforced cladding and flood defences such as sea walls. No single approach provides full protection against all losses, and combinations of adaptation measures are essential to provide maximum protection levels. However, there is a cost attached to adaptation which governments and policyholders must consider. Individuals and businesses

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⁵⁵ Adverse selection occurs when insurance buyers perceiving a high probability of loss seek to buy insurance to a much greater degree than those perceiving a low probability of loss, with the probability of loss being known only – or to a greater degree – by the insurance buyer.
⁵⁶ Moral hazard is a term to describe the reduction in risk-preventative behaviour by those covered by an insurance policy relative to those not covered by insurance.
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may need incentives to take adaptation seriously.

- Society, business and the insurance industry must be flexible in their response to climate change. Climate change projections are uncertain, and a wide range of scenarios should be considered when planning for the future. Climate change models must be constantly updated to reflect evolving scientific information, and these advances should be taken into account in adaptation decisions.

- Household and business property valuations should take into account levels of future risk. A property which has been adapted is more valuable because the risks for the home or business owner are reduced. In some areas, where defences are not introduced or maintained, properties could lose value if they are uninsurable, and the withdrawal of private insurance coverage could eventually precipitate a ‘managed retreat’ from the highest risk areas by property-owners.

- The insurance industry has a key role to play in promoting adaptation. By setting premiums at a level which reflects the underlying risk, insurers promote the concept of risk-based pricing and enable individuals to understand their risk profiles better, as well as the costs and benefits of investing in adaptation components.

- Better quality data will help the insurance industry conduct more accurate risk analysis. All parties involved in the insurance chain must push for improved data quality and geographical resolution in order to ensure a more full and proper risk analysis.

In many markets where high penetration is the norm, the property insurance tools currently in use are flawed, creating disincentives for pro-active risk reduction and not allowing the market to price in the full cost of risk. In the United States, for example, water and earthquake damage are not included in a standard homeowners’ policy. Federal and state programmes have been put in place; however, these programmes have generally had very low take-up and are difficult to price appropriately which has resulted in their subsidization – directly or indirectly.

In newly developed insurance markets, there is an opportunity to design programmes that address these issues in a more appropriate way, enabling insurance to play a more complete role in risk management, including complementing and rewarding risk reduction.

3.1.4 Disaster microinsurance

Microinsurance is the protection of low-income people against specific perils in exchange for regular premium payments proportionate to the likelihood and cost of the risk involved.\(^{58}\) Disaster microinsurance refers to policies designed for low-income populations, providing cover for physical assets or livelihoods in the event of a disaster.

Disaster microinsurance can be considered a subset of agricultural and property catastrophe risk insurance as it targets a specific consumer segment – the poor. Low-income groups in developing countries are particularly susceptible to natural disaster risks. This susceptibility will only increase in the face of climate change. State support to low-income, vulnerable communities to better manage this risk, effectively sharing the risk burden can be more efficient and in many cases more effective than direct State action and financing.

Microinsurance can also be a useful tool to manage these risks. According to Mechler et al. microinsurance provides low-income households, farmers and businesses access to post-disaster liquidity, thus securing their livelihoods and enabling reconstruction.\(^{59}\) Since insured households and farms are more creditworthy, insurance can also promote investments in productive assets and higher risk/higher yield crops, encouraging investment in disaster prevention if effectively designed.

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\(^{58}\) Craig F. Churchill, Protecting the Poor: A micro insurance compendium (Geneva, ILO, 2006).

\(^{59}\) Reinhard Mechler, Joanne Linnerooth-Bayer and David Peppiatt, “Microinsurance for Natural Disaster Risks in Developing Countries: Benefits, Limitations and Viability”, A ProVention/IIASA study, draft (ProVention Consoritum, 2006).
It is important to note that risk pooling and informal insurance are not new amongst low-income groups. Informal risk sharing schemes have been around for generations and are particularly prevalent in developing countries. However, they have been generally limited in their reach, and benefits have typically covered only a small portion of the loss.

It is also equally important to make the distinction that although microinsurance is often loosely used to refer to general risk prevention and management techniques (e.g. savings set aside for emergency purposes, such as insurance funds), in this context it involves an element of risk pooling. Churchill describes a situation in which those in a risk pool do not suffer a loss during a particular period and in exchange pay for the losses experienced by others. Insurance thereby reduces vulnerability as households replace the uncertain prospect of losses with the certainty of making small, regular premium payments. This risk pooling function means that insurance is a much more complicated financial service than savings or credit.

Microinsurance is designed to supply easily accessible policies that are highly affordable to low income households, especially for natural disasters. According to the Geneva Association, “[Microinsurance instruments] can be applied on a stand-alone basis as risk financing instruments that provide effective and timely disaster assistance from the national to the local level, or they can be embedded into credit products, thereby greatly facilitating access to financing for [individuals].”

**Box 1: Climate Risk Adaptation and Insurance in the Caribbean Project**

The Climate Risk Adaptation and Insurance in the Caribbean project seeks to address climate change, adaptation and vulnerability by promoting weather-index based insurance as a risk management instrument in the Caribbean. The project has developed two parametric weather-index based risk insurance products aimed at low-income individuals and lending institutions exposed to climate stressors.

- **Livelihood Protection Policy**: Targeted at individuals, this product helps protect the livelihoods of vulnerable low-income communities by providing swift unbureaucratic cash payouts following extreme weather events (e.g. high wind speed and heavy rainfall). This crucial support will reduce poverty and vulnerability by enabling individuals and communities to recover quickly following a disaster.

- **Loan Portfolio Cover**: Targeted at lending institutions, this product is a loan portfolio hedge that can help create a space of certainty for institutions with credit portfolios exposed to natural disaster risk. As loan portfolios are insured against climate risk, investment can reach areas previously considered too risky for traditional lending. In the short run, this creates a win-win situation for the lender and borrower, while also contributing to economic development in the region in the long run.

This project is of particular interest in the context of sovereign risk pooling. A key partner has been CCRIF, which has provided technical inputs, convening power and has made available risk capacity as necessary to assist in achieving lowest possible risk transfer pricing. The launch of the Livelihood Protection Policy has demonstrated the catalytic effect that a sovereign risk pool can have on promoting understanding of and capacity to better manage natural disaster risk at the national level, including State support for insurance mechanisms that serve low-income populations.

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60 Churchill, Protecting the Poor (see footnote 58).
3.1.5 Summary of risk transfer instruments

Table 1 summarises the different risk transfer modalities that can be used across all of the settings described above. It presents a continuum from traditional indemnity products through more sophisticated products to simple parametric products.

It is important to note, however, that there is a sharp divide between indemnity insurance and all other forms of parametric insurance that significantly influences the cost of risk transfer in any given situation. In highly developed and long-standing insurance markets, the pricing differential may be modest, but in many emerging and developing countries, the differential is likely to be substantial. The pricing for catastrophe risk, particularly if it is diversifying from a global perspective, is dictated to a significant degree by the uncertainty surrounding the quantification of risk being transferred. Where payouts are made based on subjective criteria with little experience to draw on, uncertainty will be high. Where payouts are made based on objective criteria, such as the independently measured speed of wind, that uncertainty is greatly reduced.

**Table 1: Summary of risk transfer instrument types**

<table>
<thead>
<tr>
<th>Loss Adjustment &amp; Moral Hazard</th>
<th>Basis Risk &amp; Payout Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indemnity</td>
<td></td>
</tr>
<tr>
<td>Scheme pays on actual loss</td>
<td></td>
</tr>
<tr>
<td>No basis risk</td>
<td></td>
</tr>
<tr>
<td>High cost of loss adjustment</td>
<td></td>
</tr>
<tr>
<td>Loss adjustment results in payment delays</td>
<td></td>
</tr>
<tr>
<td>Modelled Loss Basis</td>
<td></td>
</tr>
<tr>
<td>Model pays based on estimated loss from a catastrophe model</td>
<td></td>
</tr>
<tr>
<td>Basis risk should be low but still real</td>
<td></td>
</tr>
<tr>
<td>Requires time and expense to build the catastrophe model</td>
<td></td>
</tr>
<tr>
<td>Catastrophe models are good for homogeneous exposures (e.g. domestic property) but less suitable for complex risks</td>
<td></td>
</tr>
<tr>
<td>Parametric Index</td>
<td></td>
</tr>
<tr>
<td>A simplified version of a modelled loss</td>
<td></td>
</tr>
<tr>
<td>Formulae estimate hazard at certain reference points (e.g. wind speed, ground shaking, rainfall)</td>
<td></td>
</tr>
<tr>
<td>Additional formulae estimate the loss resulting from this hazard</td>
<td></td>
</tr>
<tr>
<td>Lower basis risk than pure parametric but higher than Modelled Loss</td>
<td></td>
</tr>
<tr>
<td>Parametric</td>
<td></td>
</tr>
<tr>
<td>An event occurs, payment is made</td>
<td></td>
</tr>
<tr>
<td>Simple and relatively predictable</td>
<td></td>
</tr>
<tr>
<td>Event definition made by a verifiable independent agency</td>
<td></td>
</tr>
<tr>
<td>High basis risk: smaller events may cause a large loss; a large event may conversely cause fewer losses</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Benefits of moving to an ex ante approach using structured risk management tools

As discussed in earlier sections, an ex ante approach to disaster risk financing, and particularly risk transfer solutions, brings significant benefits.

A comprehensive and structured disaster risk management approach can build resilience to external shocks by understanding and reducing hazard, exposure and vulnerability, as well as coordinating pre-agreed post-disaster plans that are backed by effective financial protection measures. In a recent book, Clarke and Dercon outlined the key elements of an effective approach to risk management. Such a comprehensive approach is increasingly being recognised as best practice and integrated into the design and implementation of risk financing solutions across a range of development actors and programs (e.g. African Risk Capacity, Start Network Drought Financing Facility). The framework below is adapted from this best practice and encompasses three main parts: risk assessment, contingency planning, and risk financing.

3.2.1 Improved risk awareness and risk recognition

The fundamental starting point for a structured risk management approach is risk assessment, equipping the involved parties with a scientific and quantitative understanding of the hazards in their areas of operation, while also recognising the value of traditional and indigenous knowledge. Where possible, vulnerability and exposure information should be combined with hazard information to estimate the likely impact of particular hazard events both under particular scenarios (e.g. the recurrence of a historical event) and through a probabilistic perspective. This assessment and quantification of risk allows planners to understand the particular risk, amongst different crisis types, in a given sovereign investment or system, and the likelihood of that investment or system being undermined or disrupted. This risk recognition in and of itself is a valuable exercise. Such exercises shift the conceptualisation of natural disasters and crises from an unexpected surprise to a quantifiable and anticipated event. Such analysis can reveal the hidden liabilities facing a State (including within each of the constituent parts of its government, e.g. departments, quasi-government institutions, agencies and ministries) and support action to reduce or prepare for those liabilities.

3.2.2 Improved risk management

The second feature of a structured risk management approach is a coordinated and agreed to plan for post-disaster action. The response plan explicitly defines stakeholder responsibilities (who or what will be protected, against what, and who will pay for what), supported by a clear decision process. This process differs from traditional pre-disaster planning by combining operational and programmatic planning with clear financial preparedness to ensure that response plans can be acted upon in the event of a crisis. The financial incentives act as glue to bring different stakeholders to the table to discuss (and agree on) how their various needs and priorities could be built into the payout mechanism. The approach also works to clarify risk ownership, for example between a government, development and humanitarian partners, individuals, households and communities.

Once response plans for different risk scenarios have been agreed and costed, ex ante financing is arranged to be released in the event of a shock. After savings, the most common form of ex ante risk financing is insurance, a transaction in which a risk holder (individual, business) pays a relatively small

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63 Clarke and Dercon, Dull Disasters, 2016 (see footnote 10).
premium, based on risk and extent of cover, on a regular basis to a risk-taker (insurance company) who is then contracted to provide a relatively large payout if a covered event occurs (e.g. car accident, natural disaster).

In indemnity insurance, the size of the payout is dictated by the size of the actual loss, so that, for example, a damaged building is repaired back to its prior state. In parametric (also called index-based) insurance, the amount of the payout is dictated by an objective measure of the causal event (e.g. the speed of the wind in a cyclone).

There are some basic differences to consider between these types of insurance when assessing their suitability as risk financing mechanisms in a given situation. The speed of an insurance payout will be much quicker with parametric insurance because the event’s occurrence simply has to be recognised and verified. In contrast, in indemnity insurance, loss adjustment has a high cost and results in payment delays. One of the key benefits of risk financing in mitigating and recovering losses is the timeliness of funding: fast payment is fundamental to its value. Therefore, since the timeliness of funds post-shock significantly decreases the long-term costs of the shock, parametric insurance is the best fit for supporting immediate response and short- to medium-term recovery needs.

The simplicity and speed of parametric insurance comes at the cost of basis risk, which is the risk that event-triggered payouts may not relate accurately to actual loss. However, this risk is worth bearing where the speed and predictability of payment is paramount. Further, most States currently approach all risks as basis risks, so any shift towards predictability will reduce status quo basis risk. Of additional note is the relatively lower data requirements of parametric insurance products, since event triggers are transparent, relatively predictable, and based upon homogenous hazard data. For a sovereign risk pool, these are important features so that each member of the pool is equally represented from a data perspective, and the rules of engagement are transparently fair to each member of the pool.

Other forms of ex ante risk financing include:

- Contingency funds, or sovereign reserves that are held in a ring-fenced budget to be used only in the event of a disaster. Such funds are often hard to defend and, in developing countries, have a high opportunity cost.
- Pre-defined budget reallocation where agreed amounts are reallocated from different budget lines to meet unexpected needs. As with holding contingency funds, the opportunity cost of budget reallocation can be high.
- Contingent credit lines which comprise pre-contracted lending facilities, where the interest rate and other terms are agreed in advance. Such credit lines generally require a service fee to be paid regardless of whether funds are drawn down or not.
- Alternative risk transfer mechanisms such as catastrophe bonds and catastrophe swaps\(^\text{64}\), which package risk such that it can be held within the larger capital market space rather than just in the restricted reinsurance space.

Risk financing generally takes a layered approach, providing flexibility to use different mechanisms to respond to different severities of events (with different quanta of financing required) on different timescales. Relatively small amounts of financing available and deployed quickly often significantly reduce the overall negative financial impact. Figure 8 illustrates this approach, expanding on the somewhat simplified version presented in Figure 5.

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\(^{64}\) Catastrophe swaps are standard financial instruments in which a relatively small premium payment is 'swapped' for a promise to pay a much larger amount on the occurrence of a pre-defined event or loss.
It is important to note that eliminating, or at least reducing, risk is almost always the most cost-effective risk management strategy. A structured risk management approach will balance the long-term value of disaster risk reduction (DRR) measures such as building more resilient infrastructure or investing in community-level preparedness versus financial preparedness measures such as purchasing insurance. Investments in DRR can lead to lower costs in insurance premiums, thereby resulting in a direct financial incentive to invest in such measures.

3.2.3 Improved response

Investments in the scientific understanding of risk, combined with operational and financial preparedness are designed to promote better and more careful risk management and preparedness for crises. The first outcome of such an approach is to bridge the traditional development-humanitarian divide, where previously humanitarian responses often disrupting an existing development pathway.

A structured risk management approach seeks to quantify the inadequacies of leaving State investments, (e.g. in public infrastructure) exposed to a range of hazards. This promotes the establishment of shared, coherent goals to protect investments. Ex ante financial instruments allow development agencies or governments to pre-commit funds in the event of a shock, in a secure manner that would allow them to be disbursed rapidly under pre-agreed actions, in contrast to using traditional, more gradual funding channels.

Further, ex ante financing can also result in improved timeliness of response to a shock. Rather than passing around the ‘begging bowl’ for post-disaster donations that arrive gradually over time, pre-positioned financing can be released immediately in response to pre-agreed triggers, thereby...
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Substantially reducing response times. This has broad economic and social benefits. For example, it reduces the chance of pastoralists having to sell cattle as a coping mechanism after a drought; and it reduces the number of lost schooling days after a cyclone.

3.3 Case study: Drought resilience building for poor farmers in the ASEAN sub-region

There have been a number of disaster risk financing initiatives developed over the past decade to support drought risk management, some linked directly to broader social protection programmes, but most implemented on a stand-alone basis. They have included insurance at the State or national level (e.g. through the African Risk Capacity), as well as micro-insurance and agricultural insurance products designed specifically for the rural poor.

At the same time, social safety net programmes have been implemented or are being developed in many drought-exposed countries with the main aim of building resilience to climate risk, which threatens the livelihoods and economic prospects of tens of millions of smallholder farmers and their families in sub-Saharan Africa and parts of Asia-Pacific.

It is important to state in unequivocal terms that disaster risk financing in and of itself cannot support all of the needs of a social protection programme. Disasters are unusual occurrences, whereas social protection programmes are implemented to address ongoing chronic needs (which, for drought, are generally related to food security). Core funding for a social safety net programme is a stable need and requires a long-term budgetary commitment. However, when drought occurs, the chronic case-load is expanded, with many more households becoming food insecure at the same time. Risk financing can thus be an efficient way to address the resulting budget volatility, particularly in developing economies, where the opportunity cost of holding reserves to fund emergency scale-up is high.

In addition to bringing financial efficiency to address scalability needs in social protection mechanisms, risk financing can also incentivize risk reduction as part of an integrated risk management strategy. Recognizing the cost of disasters through analysing and quantifying risk (i.e. calculating the financing needs of a social safety net programme for an extended future period including a variety of scales of disasters) is useful in and of itself, as the true cost of risk must be explicitly recognized before the value in risk reduction can be made tangible.

As noted above, in addition to working through a formal social protection programme, risk financing tools can also be directly deployed to foster individual and household resilience to disasters, including drought. Many State-sponsored agricultural insurance schemes are essentially social protection programmes supporting the rural poor. By protecting farmers against the consequences of climate disasters out of their control, rural livelihoods are made more resilient, and risk-taking to increase productivity (for example by investing more up-front in high-yield seeds) is incentivized. Again, such instruments can directly incentivize better risk management, although such linkages are not necessarily straightforward.

Devereux effectively addresses social protection for drought in his paper on sub-Saharan Africa. It offers some important principles of social protection for food security, and introduces key implementation concepts including insurance.

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65 Clarke and Dercon, *Dull Disasters*, 2016 (see footnote 10).
The following two sections describe some examples of risk financing for social protection from around the world and examines the state of such programmes in Asia-Pacific. The final section discusses particular opportunities and challenges in deploying risk financing tools to support drought resilience in the ASEAN sub-region.

### 3.1.1 Examples of disaster risk financing to support social protection of the rural poor

The examples described below cover the three main modalities that have been tested and implemented globally, which link disaster risk financing with social protection for drought in the developing world.

#### Risk financing for funding emergency scalability in a social safety net: HSNP in Kenya

Kenya’s northern regions and, in particular, the four counties along the border with Ethiopia are arid with fragile livelihoods barely supported by pastoral livestock and subject to frequent droughts. Food insecurity is chronic. The Hunger Safety Net Programme (HSNP) has been developed over the past decade to address this need by making regular cash transfers to over 100,000 households: all of whom registered in the programme, underwent regular assessments of their poverty level, and set up a bank account to which the cash transfer could be made.

More recently, HSNP has included an index-based emergency payment mechanism to enable additional households to receive cash payments if drought conditions are revealed through a satellite-based vegetation index. Such households must already be registered and able to accept cash transfers. The scope of the emergency payments is dictated by both the poverty level of the household (so those closest to the poverty threshold level to qualify for regular cash transfers receive emergency support first) and the magnitude and spatial extent of the drought (as measured objectively through the vegetation index at the sub-county level.)

The scalability element of the programme provides a financing challenge which, in other contexts, is commonly solved by using risk financing tools. HSNP cash transfers are made bi-monthly, totalling US$5 million for every payment period. On average, emergency payments add an additional US$1 million but historically have reached as high as US$7.5 million in any single two-month period. That said, in many two-month periods, no emergency payment is needed. Because speed of payment is a critical element of the HSNP emergency scalability mechanism, funds for emergency payments need to be readily available. However, holding and managing a contingency budget to cover potential scalability needs is politically challenging and can be expensive due to the high opportunity cost of those funds in a development context.

A more efficient financing mechanism is risk transfer. Kenya and the African Risk Capacity’s insurance entity (ARC Ltd) are discussing an innovative mechanism that would displace all of the budget volatility from the scalability element of HSNP to the global risk markets. It would be packaged such that payments from the markets, triggered by a parametric insurance policy would always and exactly match the emergency cash transfer needs of the programme, occurring within the required time-frame. Based on the known appetite of global risk markets for parametric risk, ARC Ltd estimates that the marginal cost of risk transfer will be lower than that of any other risk financing mechanism.

#### Micro-insurance linked to a social safety net: R4 in Ethiopia

The R4 Rural Resilience Initiative (R4) is a comprehensive risk management approach to help...
communities build more resilience to climate variability and shocks. The R4 programme, now implemented by the UN World Food Programme (WFP) and Oxfam America, is a direct successor of the HARITA programme launched in Ethiopia in 2008 to build resilience to drought, and compliment the broader Productive Safety Net Programme (PSNP) operated by the Ethiopian government.\textsuperscript{69}

The goal of the R4 programme is to integrate four separate risk management elements into a holistic strategy to build resilience:

- Improved resource management through asset creation (risk reduction)
- Insurance (risk transfer)
- Livelihoods diversification and microcredit (prudent risk taking)
- Savings (risk reserves)

An impact evaluation of HARITA in its first four years\textsuperscript{70} found that insured farmers saved more than twice than those without any insurance, and as a result they invested more in seeds, fertilizer and productive assets, such as plough oxen. In Senegal, a more recent impact evaluation\textsuperscript{71} highlighted that despite two consecutive bad harvests (due to drought), R4 farmers were able to maintain their food security levels compared to farmers living in the same area and exposed to the same shocks.

Amongst the key innovations of R4, the following are most notable:

- Farmers can access weather index insurance by paying with their labour through Insurance-for-Assets (IFA) schemes. When a drought hits, compensation for weather-related losses protecting farmers from having to sell productive assets and stimulates faster recovery.
- IFA schemes can be built into existing social safety nets, such as PSNP in Ethiopia. Assets built-up through risk reduction activities promote resilience by steadily decreasing vulnerability to disaster risks over time.
- By protecting farmers’ investments in case of a bad season, R4 enables households to invest in riskier but more remunerative enterprises, as well as in seeds, fertilizers and new technologies to increase their agricultural productivity.
- Participants establish small-scale savings that are used to build ‘risk reserves’ which in turn reduced vulnerability to smaller drought events.

One key challenge with HARITA/R4 in Ethiopia has been the extent to which the model can be scaled up to reach a larger portion of the vulnerable population. Around 30,000 farmers are enrolled in R4 in Ethiopia, covering a total population of around 150,000, which is just 2 per cent of the PSNP beneficiary total.

\section*{Agricultural insurance as rural social protection: CADENA in Mexico}

The Component for the Attention of Natural Disasters (CADENA) programme\textsuperscript{72} was launched in 2003 by the Mexican federal government in partnership with the 32 Mexican states, targeting around 4.5

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The purpose of CADENA is to provide relief to smallholder farmers when crop failures occur, but to do so in a way that makes government expenditures more predictable. The federal government has promoted the use of insurance by subsidising up to 90 per cent of premium payments paid by state governments, while gradually reducing the percentage of funds it contributes to ex post relief. While individual farmers are not insured directly, state governments receive indemnity payments and distribute them to affected farmers. The programme began with drought index insurance covering small-scale maize and sorghum farmers in one state in Mexico. The programme has since expanded significantly, in both geographic scope and breadth of coverage. CADENA now utilises weather index insurance for a variety of perils in addition to drought, as well as area-based yield index insurance that provides payment when the average yield in an area, as determined by a random sample, falls below a threshold. CADENA also offers traditional and remote sensing index insurance for livestock.

While not focussed solely on drought, and more relevant to middle-income countries, CADENA provides an example of a comprehensive social safety net implemented wholly through insurance. A recent evaluation of CADENA\(^73\) found that:

- Payments from weather index insurance allowed farmers to cultivate a larger land area in the season following a weather shock.
- Households in municipalities receiving payment appeared to have larger per capita expenditures and income in the subsequent year.
- While the cost of insurance appeared to be higher relative to the payouts, the benefits exceeded the costs for a substantial range of outcomes.

### 3.1.2 Existing activities in Asia-Pacific

Social protection spending in Asia-Pacific is below the global average\(^74\), and relatively little focus is placed on preventing chronic or shock food insecurity. Meanwhile, the challenges of managing drought risk in Asia-Pacific are substantial. About 20 per cent of Asia’s rice-growing areas are thought to be exposed to drought risk\(^75\), which could potentially result in a major economic and social disruption, including food insecurity amongst the most vulnerable.

In the broader Asia-Pacific region, India has the world’s largest weather index insurance programme\(^76\), which alongside the bigger yield-based index insurance programme effectively acts as a social safety net for close to 25 million farms\(^77\) and more than 100 million people. Such a huge programme comes at very significant cost. There have been a number of attempts to introduce greater efficiency into the programme, as documented in a substantial volume of literature.\(^78\) The most recent overhaul

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Opportunities for Regional Cooperation in Disaster Risk Financing

and expansion was introduced by the Indian Prime Minister in February 2016 with the creation of the “Pradhan Mantri Fasal Bima Yojana” programme, which aims to reduce the burden of premiums on farmers significantly and expand coverage. It also promotes the use of advanced technologies to estimate losses accurately and accelerate payments to farmers. It is not yet clear how effective this programme will be. In its first year of operation, the number of covered farmers expanded by over 30 per cent and the amount of coverage also expanded on a per-farmer basis. However, overall actuarially-fair premium rates rose substantially (though farmers are actually paying less, meaning that subsidies have increased), and there have been challenges in loss adjustment and payout delivery. The new programme also failed to expand its reach to shareholder and tenant farmers, with its mandatory scope limited to farmers holding loans.

Elsewhere, weather-based index insurance has started to expand, including for drought in China and other agricultural insurance programmes (including for both crops and livestock) that have been or continue to be in place in Indonesia, Thailand, the Philippines, Bangladesh, Mongolia and Viet Nam amongst others. These programmes vary widely in scope, form and degrees of success.

In the ASEAN sub-region of particular interest (comprising Cambodia, Lao PDR, Myanmar and Viet Nam), Viet Nam has moved the furthest towards introducing agricultural insurance, albeit with mixed success. In general, financing the rural poor to build resilience for drought-related food insecurity related is in its earliest stages of consideration, and there are no substantive social protection or insurance programmes in place that could act as building blocks.

A key step was taken in August 2014 with the convening of the ASEAN Climate Resilience Network (ASEAN-CRN) Knowledge Exchange Event on Effective Policies for Promoting Agriculture Climate Insurance to Increase Resilience in Viet Nam. In addition to a broad exchange of ideas amongst ASEAN member States, some important issues emerged, which are of particular relevance to the four countries:

- Recognition of Viet Nam’s national agri-insurance scheme.
- Cambodia’s launching of a small agricultural insurance pilot in 2014, implemented by a civil service organization with funding from a non-governmental organization in the Netherlands.
- Specific requests for regional collaboration on capacity building from Cambodia, Lao PDR and Viet Nam.
- Lao PDR requesting advisory support for a national agricultural insurance programme.
- Viet Nam requesting collaborative support to pilot index insurance.
- Myanmar and Cambodia proposing bilateral collaboration in assessing feasibility for and piloting weather index insurance.
- Viet Nam and Cambodia proposing bilateral collaboration in the area of remote sensing technology.

Further, each of the four sub-regional countries presented an action plan on agricultural insurance. None, however, mentioned integrating insurance with social safety net programmes. Also, weather index and agricultural insurance appeared to be being viewed as stand-alone products rather than part of an integrated risk management system for the rural poor. As demonstrated by the three examples above, financing tools on their own cannot provide all the necessary facets of a social protection programme for the rural poor, even when specifically targeting a particular climate risk such as drought.

Another useful building block is the Drought Mechanism programme under ESCAP, which involves an early warning system via space-based monitoring. The ESCAP programme has pilots in both Cambodia and Myanmar. Early warning is a critical component of drought risk management; and as demonstrated by the African Risk Capacity, early warning combined with contingency planning and ex ante risk financing can reduce the overall impact of a drought by up to 4 to 5 times.

It is also important to link drought science, including monitoring and early warning to quantification of drought risk in terms of economic impact and livelihood impact, which is a required pre-cursor to cost-effective risk financing. The ARC Africa RiskView climate risk modelling and monitoring platform is an example of an integrated technical engine that supports risk profiling, early warning and insurance contract execution, all in an open and transparent manner and with a key focus on accessibility to participating countries.

3.1.3 Key opportunities and challenges

Within the ASEAN sub-region, there are a number of opportunities to deploy risk financing tools to support rural resilience against drought. The development and implementation of social protection programmes, specifically those which foster resilience to drought as well as broader climate resilience, have been on the rise in recent years. The post-2015 development agenda on climate risk management has created an environment of mutual support and learning surrounding the use of risk financing, driving a paradigm shift in the way disaster response works. This is evidenced in the emphasis on risk financing in the Paris Agreement and the Sendai Framework, the critical role of resilience within the SDGs, and the G7 InsuResilience initiative. The culmination of these efforts have slowly shifted the paradigm from an ex post financing model to an ex ante financing model – planned in advance and executed quickly and efficiently to save more lives and offer greater protection to the livelihoods of the most vulnerable.

The former model of broader social protection to foster resilience to food insecurity is also evolving with pre-registration of recipients rather than post-event needs assessments, and cash transfers rather than food aid. Scalable social safety nets have shown their potential to channel financing to those in need when a drought occurs. The use of risk financing tools to support such programmes has thus proven effective in marrying global risk market capacity with budget stability amongst developing countries.

Agricultural insurance has in the past been used as a social protection mechanism for the rural poor, but in most forms this approach has been expensive. The development of weather index insurance has created opportunities for other more efficient insurance programmes. But, when deployed alone and at the level of individual farmers, weather index insurance has proven to be a disappointment in its ability to foster resilience. However, when linked to other programmes within a holistic disaster risk framework, such as in the R4 programme described above, such insurance tools have proven more effective. There has also been more success in using index insurance tools at the macro level, as long as the financing benefits are able to flow quickly and efficiently down to those in need.

A relatively new development in the area of index-based insurance is forecast-based financing, in which some financing flows prior to an event using triggers based on scientific forecasts. This is particularly effective for slow-onset disasters like drought. While the issue of basis risk becomes even more challenging for forecast-based financing than for conventional index insurance, the early availability of even limited financing for pre-disaster deployment of emergency resources could lead

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to significant gains in resilience. Forecasting, however, is heavily dependent on remotely-sensed datasets. The ability to the use of space-based data at the regional level would thus be a critical element in the development and deployment of forecast-based financing. ESCAP could play a critical role in this respect, as evidenced in the Drought Mechanism programme.

A final challenge to mention is a technical one. Capturing the extent and severity of drought, and the impacts of drought on a population through remote sensing (e.g. NDVI, EVI) or through rainfall (e.g. SPI) or through modelling based on rainfall and other parameters (e.g. WRSI) is non-trivial. Any index-based approach, be it at macro level, meso-level or micro level, whether for direct insurance or to support social protection programme scalability requires an index that reasonably proxies the impacts of the drought on the target population. Many potential drought indexing tools are available for testing and have been used for risk profiling, but only a few have been used as a basis for drought risk financing.

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4
Feasibility and Financial Efficiencies of Regional Collaboration for Disaster Risk Transfer in Asia-Pacific
This chapter draws heavily on a policy brief produced by the World Bank in early 2017 for the German presidency of the G20. The author was one of three experts tasked with drafting the World Bank report on sovereign risk pooling. In that Policy Brief, 10 lessons were provided for the creation and bringing to scale of catastrophe risk pools. These 10 lessons are used here as a basis to explore the feasibility and financial efficiencies of regional collaboration for disaster risk transfer in the Asia-Pacific region.

4.1 Pools need strong political commitment at the national and international level

Sovereign catastrophe risk pools require strong political momentum and coordination among participating countries, especially during the design and preparation stage. A strong regional organisation is often critical to facilitate the political and policy coordination needed between participating governments.

One of the key challenges in the Asia-Pacific region is the multitude of regional political groupings, and wide range of geographies and socio-economic characters. As described in section 2.4, there are active sovereign disaster risk financing initiatives already in place in at least four regional organisations (SPC, APEC, ASEAN, ADB) and several parallel tracks within different sections of these organisations.

ESCAP can bring value by building political commitment across the full complement of countries in Asia and the Pacific, and has its strongest relationships with Ministries of Finance and Economy where disaster risk financing decisions must be made with appropriate financial and economic justification.

4.2 Pools often rely on strong donor support

Humanitarian and development donors have a role to play in creating incentives for investments in pre-agreed risk management and risk financing solutions (both at the country level and within donor organisations), and in reducing reliance on unpredictable and uncertain post-disaster humanitarian assistance. Concessional financing from donors or multilaterals may be necessary to create the enabling environment and incentives for systematic adoption of disaster risk finance and insurance solutions, including catastrophe risk pools.

Donor support for ex ante disaster risk finance is both strong and coordinated in the Asia-Pacific region. The InsuResilience Global Partnership was created to enhance what was already a well-coordinated approach to supporting disaster risk financing initiatives, with Germany and the United Kingdom taking the lead in the funding of vehicles for execution of early and later stage risk financing implementation projects – the DFID Centre for Global Disaster Protection and the KfW Insurance Solutions Fund.

In the case of Germany, this global leadership role builds on its historical support for funding disaster risk reduction in Asia including to ESCAP. Other G7 and G20 countries have expressed or committed

support for disaster risk financing initiatives in the Asia-Pacific, some on a bi-lateral basis and others through multi-stakeholder vehicles.

The relevant multilateral development banks (World Bank and Asia Development Bank for Asia-Pacific) have also demonstrated a strong commitment to support disaster risk financing initiatives, providing both technical assistance, and regional risk pool capitalisation and premium financing.

Coordination of available and willing support is critical to ensure effective use, and ESCAP has both the tools and the experience to facilitate this across the entire region. Further, ESCAP brings specific expertise to bear in risk assessment and capacity-building, areas that complement the capabilities of the multilateral development banks (MDBs).

### 4.3 Pools can strengthen disaster preparedness and crisis response

Catastrophe risk pools are part of a comprehensive approach to disaster risk management and play a key role in efforts to strengthen preparedness and crisis response.

Not all disasters and crises can be prevented. Governments need to be ready to manage the impacts of such residual risks through pre-agreed post-disaster plans, backed by pre-planned financing.

The process of developing such post-disaster action plans and identifying related costs can also generate risk information and create incentives to step up investments in prevention and adaptation to reduce risks in the first place.

It is critical that disaster risk financing in general, and risk transfer and insurance in particular, are part of an integrated risk management framework that incentivizes risk reduction, using risk transfer only where it is cost-efficient or where benefits of risk reduction (including more efficient response) materialize incrementally.

Risk transfer mechanisms can be used to efficiently move risk around and risk pools bring additional benefits, but neither directly reduces the underlying risk. In particular, pooling risk only reduces the amount of capital that a pool must hold to cover a certain severity of event for all pool participants. This reduction is relative to the amount each participant would have to hold for itself to cover the same severity of event. Thus, pools should be designed to maximise the additional benefits which come through better preparedness and faster, pre-planned response, along with the peer-pressure that goes with shared goals and commitments, which can be a powerful driver of such activities.

With its technical expertise and convening power, ESCAP is well-placed to ensure that risk pooling in Asia-Pacific is designed and implemented such that the value of better preparedness and response is fully captured.

### 4.4 Pools can foster policy dialogue on risk management and risk ownership

In addition to offering financial protection, catastrophe risk pools can facilitate regional policy dialogue and improved collaboration between participating countries and donors on risk reduction and risk management. They offer a vehicle to anchor (i) financial planning (with participation in a risk pool an integral part of a more comprehensive disaster risk financing strategy that brings together various financial instruments); (ii) contingency planning; (iii) ownership of and collaboration on the climate
risk management agenda between and within countries; and (iv) risk-informed investments in risk reduction through the pricing of climate and disaster risks.

In addition, pools help clarify who “owns” the risk and encourage countries to plan for disaster response. Many developing countries still rely on appeals-based mechanisms and seek donor assistance to help fund relief and response activities following a shock. Although it may come at no cost to the recipient country, such aid is unpredictable and uncertain, and often takes time to materialise.

It has become apparent in recent years that better understanding and more openness about risk ownership is a critical element of disaster risk management. For least-developed countries, the risk ownership discussion must take place between the State and its international partners, both on the humanitarian response side (usually the first responders after natural disasters) and on the development side where much of the burden of long-term recovery falls, often through broken development pathways and extended timelines. For middle-income countries and emerging economies, the ownership discussion must take place between the Government and its population. What risk is held by the State as a legal or moral obligation? And, what can be reasonably expected to be taken on by individuals and businesses? For developed States, discussions may take place within the government about risk ownership moving down to individual departments and sub-governmental entities.

Across these discussions, there is a need to develop common understandings of risk, and the most efficient and effective tools to manage that risk, whether through risk reduction, risk transfer or risk retention tools. Building the capacity to undertake such discussions is an area where ESCAP can play an important role.

4.5 Pools can maximise impact by developing pre-agreed disaster response plans

Pre-agreed disaster response plans ensure a timely, transparent and efficient use of funds in the aftermath of a disaster, thereby maximising the impact of rapid cash injections. Linking financial instruments, including risk pools, to pre-agreed post-disaster programmes, can help ensure that funds are efficiently channelled to support targeted post-disaster responses. For example, payouts from risk pools could potentially be used to scale up support from existing national safety net programmes to poor and vulnerable households in the event of a disaster. Likewise, pre-agreed response plans can help identify critical infrastructure to prioritise in the aftermath of a disaster. However, response plans should always allow for some flexibility to ensure they can address unexpected expenses.

By engaging a wide range of stakeholders, including civil society members, the process of developing such plans can also contribute to raising awareness of the benefits offered by risk reduction and financial protection.

Thus far, ARC has developed the strongest foundation for capturing the value of early action funded by parametric insurance. ARC integrates four key elements to deliver a truly holistic risk management platform: (1) risk quantification; (2) early warning; (3) contingency planning; and (4) risk financing. ARC has developed an in-house software platform, Africa RiskView, that acts as both a risk quantification tool and an early warning information source. By developing knowledge of natural hazards, and the risks they pose, early warning information (currently on drought and cyclone) is better understood, contextualised and communicated to decision-makers. Technical Working Groups are convened in each ARC country to support this process. ARC has also developed specific standards and guidelines for preparing contingency plans that are reviewed bi-annually by both technical experts and peer practitioners. These standards and guidelines are used as the basis for second stage planning once an insurance payout becomes likely; the specific use of the risk financing is itemised, against
which the response activities are audited. Peer learning promotes best practice in both planning and implementation, leading to better outcomes and the capturing of an ever-increasing resilience dividend through reducing both short-term and long-term socio-economic impacts of natural disasters.

Most recently, ARC extended its activities and insurance policies to international organizations (e.g. World Food Programme) and non-governmental organizations to drive even more impact. The programme is called “Replica Coverage”, and allows international organizations (IOs) and non-governmental organizations (NGOs) to access insurance if they can demonstrate harmonization between their response plans and governments’ pre-agreed disaster response plans. The replica insurance policy behaves in the same way as the government’s own insurance policy, so that any payouts would occur at the same time, and could thus directly fund coordinated responses.

ARC is also working with the governments of Kenya and Ethiopia to deploy risk transfer in support of objective scalability elements in social safety-net programmes. These programmes have established channels for distributing assistance (often in cash) so the scaling up of these programmes when disaster strikes are efficient response mechanisms – well-suited to ex ante financing through insurance.

Through its role as a convenor, ESCAP can bring together the key actors to link contingency planning with risk financing. Of the three multi-national risk pools currently active, ARC is the only one created within a UN Agency with a multi-disciplinary approach. This has enabled the different disciplines needed for effective risk assessment/financing and contingency planning to be successfully integrated.

### 4.6 Pools can create public goods

The creation of risk pools has driven the development of catastrophe risk models and other public goods (such as improved insurance literacy, institutional capacity, and disaster risk data and modelling capacity) that have proved to be valuable in multiple areas. For example, the Pacific Risk Information System (a platform that includes an exposure database of over four million assets in the region) and its associated catastrophe risk model have been used by domestic insurers and brokers to inform their underwriting and pricing decisions. In Fiji, the model was used to inform the provision of catastrophe risk insurance for hotels and resorts. The model has also been used to explore the feasibility of crop insurance in some Pacific islands.

The tools underpinning a successful risk pool also have wider benefits. This is an area where ESCAP has particular experience, for example in the Regional Cooperative Mechanism for Drought Monitoring and Early Warning and in the 20-year-old Regional Space Applications Programme for Sustainable Development. Managing and maximising the benefits of technical public goods is a major positive outcome of the development of risk pools.

### 4.7 Pools can offer cost-effective insurance solutions

Pools can make risk transfer more cost-effective by helping to (i) diversify risk across multiple countries with different risk profiles; (ii) establish joint reserves to self-insure a part of the risk managed by the pool; (iii) facilitate access to international reinsurance and capital markets; (iv) share operational costs, such as programme development and day-to-day back office operations; and (v) build up a better foundation of risk information.
By helping countries develop standard products based on their respective needs, and structuring a portfolio of diversified country risks, risk pools offer larger transaction sizes that are more attractive to global reinsurance and capital markets.

In addition, risk pools can reduce premiums by reducing the cost of capital, operating costs, and the cost of risk information. Pools cannot reduce the underlying climate and disaster risks countries face. But they can create incentives for risk reduction measures by putting a price on risk.

Figure 9 summarizes the many financial benefits of risk pooling. As previously noted, a risk pool does not directly decrease the “pure risk” or annual expected loss of participating countries. Rather, the additional costs that must be captured through the premium charged to each participant over and above that participant’s pure risk cost, and which forms the floor to insurance pricing are all positively impacted through risk pooling.

**Figure 9: Financial benefits of risk pooling**


### 4.8 Pools are part of a comprehensive financial protection strategy

The parametric insurance products offered by risk pools provide rapid (but limited) liquidity in the immediate aftermath of infrequent and severe disasters. Other financial instruments, such as contingency funds and contingent loans, can be used to finance recovery and reconstruction efforts, as well as the cost of more frequent disasters.
Governments can strengthen financial resilience by combining financial instruments that address different needs and have different cost implications. For example, insurance may provide cost-effective cover against severe events, while budget reserves or contingent credits may be more cost-effective for addressing more frequent and less severe events. Since climate change may over time affect a country’s risk profile by potentially increasing the frequency and intensity of such hazards, the combination of financial instruments used to address disaster impacts will also need to evolve to account for changes in risk and other considerations beyond pure financial aspects.

In order to be effective, participation in a risk pool, or in any risk transfer transaction, requires a rigorous economic assessment of the relative value of risk transfer and other potential risk management mechanisms. While tools have been developed to assist in completing such analysis, there remains a need for capacity building amongst the Ministries of Finance, Economy and Planning in many countries in Asia and the Pacific to ensure that the basis for risk transfer transactions and participation in a sovereign risk pool is well-understood and politically defensible. The regional mandate of ESCAP could facilitate such capacity building, ensuring that the required analytical tools and services are deployed, while also fostering a sustainable environment for risk pooling.

4.9 Pools facilitate a shift toward proactive risk management

Catastrophe risk pools require participating countries to pay up front an insurance premium that reflects actual risk exposure in exchange for the insurance coverage, thereby shifting payment so it takes place in predictable instalments before disaster strikes. It may be challenging for countries that previously relied on donor support to start paying for climate and disaster risks with national resources through an insurance premium. However, moving in this direction, even partially, can provide the right incentives for proactive planning and risk-informed investments in risk reduction.

Described as the most important, and also the most challenging aspect of successful, sustainable risk pooling, up-front payment requires honesty and openness about risk; collaboration about sharing risk; and political will to pay up-front for something which may not return any value within a political term. Traditionally, this is a cost that has been “kicked down the road”, picked up by future generations in the form of higher debt and delayed economic development.

Constructing a long-term economic narrative that incorporates paying up-front for future losses is a task that ESCAP is uniquely positioned to do, alongside delivering such a narrative to Ministers of Finance across the region. There is a growing body of qualitative and now quantitative evidence, on which ESCAP can build, showing that paying up-front for risk through insurance premiums drives better risk reduction behaviour (as the ultimate economic benefits materialize immediately through lower premiums, rather than later through reduced damage after an event). The ability of insurance to pay out quickly also has a significant economic benefit; various studies suggest that earlier payouts can reduce the ultimate cost of a disaster by 3 to 10 times relative to traditional ex post financing.

4.10 Pools can be sustainable only with more formal and predictable approaches to premium financing

One of the main challenges affecting the sustainability of sovereign catastrophe risk pools is a lack of certainty about payment of insurance premiums from year to year. By definition, insurance premiums present an up-front cost, which may not produce a financial return in the near (or even medium) term. Governments can face public and political pressure where payments for premiums on high-profile sovereign insurance do not yield a payout in the event of a disaster that does not meet the pre-agreed criteria for a payout. At the country level, allocating budget for the payment of premiums is generally not a permanent part of budgetary processes and the expenditure is still treated as atypical.

Concessional insurance (through targeted premium subsidies or concessional loans) can help countries secure premium financing for several years while they progressively include premiums as a budget item in their national budget. In addition, building the capacity and awareness of decision makers on the benefits of risk management for financial and humanitarian resilience can help increase ownership and commitment.

That premium financing could potentially be available to support early-stage risk pool participation is a major evolution in thinking about sovereign disaster risk financing. This evolution is only in its infancy, and the rules surrounding such premium financing are still being drafted. Premium financing can facilitate two things: (1) a more efficient management of risk by all risk owners; and (2) an appropriate and planned transfer of ownership from the international donor community (whom effectively own a lot of natural risk currently) to States and potentially onward to individuals once they have the economic capacity to own that risk.

ESCAP has the technical capacity to work with the international donor community, both bilaterally and multilaterally to develop and implement a programme of concessional insurance to support the launch and growth of one or more regional risk pools to serve countries in Asia and the Pacific. The economic case for premium financing, particularly in the early years of a risk pooling programme, is still being built. Needless to say, the particular insights that ESCAP has into the economic and social situation of countries in Asia and the Pacific, and the consequences of disaster impacts will be critical to building the case for premium financing in this region.
5

Review of Potential Risk Pooling Implementation Modalities and Financial and Technical Resources
In this final chapter, key aspects of the regional landscape for sovereign risk pooling will be summarised, and a framework for implementing pooled risk transfer solutions will be presented, drawing on experiences from both within and outside the region. The role of ESCAP in both developing and implementing such a framework will be highlighted, with due attention given to the financial and technical resources needed to support that role.

5.1 Current status of risk financing in Asia-Pacific

5.1.1 Risk pooling

At the end of 2017, there were a number of sovereign disaster risk financing initiatives underway in the Asia-Pacific region. Though these initiatives were at different stages of development, they covered overlapping governments and provided a range of delivery mechanisms. Each of these initiatives is briefly summarised below.

PCRIC

In the Pacific Islands, there is a regional risk pool that is now well-capitalized and offers parametric (modelled loss) coverage for tropical cyclones and earthquakes (including tsunami impacts) with an established, low-cost route to the international risk markets. Announcements made at CoP23 in Bonn suggest that the small island developing States of the Pacific were seeking to expand their use of insurance. The PCRIC is an obvious vehicle to facilitate such an expansion if it takes place on a regional basis.

World Bank

In a report entitled “Towards a Regional Approach to Disaster Finance in Asia”, the World Bank presented a model in which a regional risk financing facility, supported by a technical assistance facility, could sit as a transformation vehicle between individual and/or pooled countries and the global risk markets where the ultimate risk takers reside (Figure 10).
In addition to describing how national risk financing programmes might develop and interact with such a facility, the World Bank document also discusses the expansion of an existing project initiating sovereign risk pooling between Lao PDR, Cambodia and Myanmar (known as “SEADRIF”90) as a potential pathway to develop a larger Asia-Pacific risk pool.

### ASEAN

At a meeting of the ASEAN Cross-Sectoral Coordination Committee on Disaster Risk Financing and Insurance in Lao PDR in November 2017, the ASEAN position on risk pooling and the continuation of its Disaster Risk Financing and Insurance programme were discussed. The World Bank presented its SEADRIF project, while representatives of German government agencies, GIZ and KfW, presented a second risk pooling concept developed under the KfW Insurance Solutions Fund umbrella.

This second risk pooling concept could potentially complement SEADRIF as it focuses exclusively on creating a larger and more dependable ex ante financing window for rapid post-disaster response and early recovery through the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre).

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90 SEADRIF will be a regional catastrophe risk pool akin to an insurance-based disaster liquidity facility. It will be designed to provide participating countries in Southeast Asia affected by natural disasters with immediate rapid response financing. Countries participating in SEADRIF will also benefit from advisory services at the national level to build and implement comprehensive disaster risk financing strategies as well as develop innovative joint regional financial solutions. Initially focused on Cambodia, Lao PDR, and Myanmar, SEADRIF could expand to other countries to strengthen regional cooperation and financial resilience. Available from http://www.worldbank.org/en/events/2017/05/05/southeast-asian-countries-reach-milestone-agreement (accessed 25 March 2018).
5.1.2 Stand-alone sovereign risk transfer

In addition to the initiatives on risk pooling across the Asia-Pacific region, there are also a number of individual States pursuing risk transfer on a stand-alone basis as part of their domestic disaster risk financing strategies. These tend to be larger and/or more developed countries which have risk diversification internally – either through geographical size or through having a larger and more diverse insurance market. As noted earlier, the Philippines recently completed the first sovereign disaster risk transfer transaction in a developing/emerging economy in the region, and many others are now pursuing stand-alone solutions in addition to discussing pooled solutions. Some of these States include Indonesia, India, Pakistan, Bangladesh, Sri Lanka, Thailand and Viet Nam.

5.1.3 Demand for sovereign insurance

While it could be implied that a high demand for sovereign risk insurance solutions, including risk pooling exists across Asia-Pacific, based on the large number of active projects and programmes, actual willingness to pay actuarially-sound premiums has not yet been widely demonstrated. This is consistent with other regions where risk pooling is already taking place. Both ARC and PCRIC continue to face challenges in building demand, fighting against the strong headwinds of lack of fiscal space and lack of short-term political benefit. In the Caribbean, the recent succession of major hurricanes has resulted in large payouts to multiple countries, making the value proposition of CCRIF more palpable, and helping to bolster demand for coverage.

Notwithstanding, it could still be said that in a broader sense, there is growing acceptance among States and international development partners that risk financing should play some role in managing climate and other natural disaster risks, and financing risk proactively is much more cost-effective than doing so reactively. This will ultimately lead to greater use of risk financing tools with shared and evolving ownership of risk, of which risk pooling is a particularly efficient tool.

5.2 Framework for expanding access to risk transfer countries in Asia and the Pacific

The concept of a single disaster risk pool for Asia-Pacific to mirror that of the Caribbean (CCRIF) or Africa (ARC), is not considered realistic. The wide range of diverse economies and political interests, the variety of multi-national groupings as well as other factors warrant a more flexible and pragmatic framework, with greater emphasis on coordination and facilitation.

The model presented by the World Bank91 illustrated in Figure 10 provides an appropriate framework into which individual programmes and projects including risk pooling initiatives could be integrated. A brief description of each of the individual elements of that framework is provided below.

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91 Mahul, “Toward a Regional Approach to Disaster Risk Finance in Asia: Discussion Paper” (see footnote 89)
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adaptation agenda, with short-term elements addressing ongoing loss and damage, and longer-term elements supporting adaptation and resilience.

As these strategies evolve, it is important to recognise that there are likely to be commonalities across the different national strategies. An enabling environment or platform at the regional or pooled level could serve as a catalyst to drive adoption of structured disaster risk financing approaches.

So, while it will be impossible to foresee all the potential mechanisms that might be required by each individual country, it may be possible to identify opportunities to implement pooled solutions. One such opportunity has already been operationalised through the PCRIC, though there is further potential to expand the reach of PCRIC in terms of its membership and the scale of risk transfer it is facilitating. Another opportunity under development is the World Bank supported SEADRIF programme, involving three particularly vulnerable developing countries who have agreed to work towards a pooled solution to address some of their short-term disaster response needs. A third opportunity is the use of risk transfer to upscale the response capacity of the existing ASEAN pooled emergency response mechanism - the AHA Centre. The AHA Centre, while still in its very early stages, seeks to leverage existing institutions, multi-lateral agreements and delivery channels to address emergency response needs that are clear and largely unmet across the region.

Other opportunities for risk pooling which are likely to emerge as national strategies develop, and which could be implemented alongside such strategic development include:

- Sector-specific pools to facilitate risk transfer to address post-disaster needs in education and agriculture. These two sectors in particular are highly vulnerable to natural disaster risk. Moreover, they address the needs of the low-income population, and have a demonstrated value proposition in terms of changing the status quo for post-disaster recovery.
- A regional vehicle to provide a “resilience wrapper” of insurance around large public and public-private infrastructure investments, both at the domestic level but particularly for multi-national projects (e.g. Asian Super Grid).

Joint disaster insurance fund

The World Bank framework for Asia envisages a single joint fund or pool for the broader Asia-Pacific region. But, there is a need to conceptualise multiple pools serving different groups of countries and potentially for different purposes within the Asia-Pacific region. Already PCRIC is in place and SEADRIF is under development; however, experience from elsewhere in the world suggests that many other factors play a more important role than the potential ‘technical’ efficiencies of a single large pool trying to serve an abundance of different purposes.

It is the author’s view that a joint fund should be used to provide seed capital to individual pools or sovereign risk transfer vehicles, potentially acting as a conduit for premium financing in the early stages of such pools, as well as to finance technical assistance work. It is possible that a regional fund to cover the most extreme parts of the risk profile of sovereign risk transfer vehicles may be worthy of consideration at some point in the future, but as of late 2017, the excess capacity in and low costs of risk transfer to the global markets would render such a use of funds inefficient.

Governance of any joint fund must be inclusive, recognising the broad range of needs across the region. Any regional fund would also need to coordinate with other government or donor financing mechanisms, accepting that it is highly unlikely that all funding for disaster risk financing across the Asia-Pacific will be able to flow through a single fund.
Global experience strongly demonstrates that a public-private partnership model is the most appropriate framework for a platform intended to transfer public-sector sovereign risk into the private global risk market. Again, given the wide variety of potential risk transfer modalities that countries in Asia and the Pacific may wish to utilise, a single platform may not be appropriate or possible. Yet, a model for platform design and sharing of technical and administrative resources across independent vehicles might be possible.

The three existing multi-State risk pools each utilise a similar model for the risk transfer vehicle. In each case, an institutionally light private-sector insurance entity has been formed in an established and well-respected domicile that is owned indirectly by the participating countries. In the case of CCRIF and PCRIC, it is domiciled within the region, while in ARC, it is based externally with the aim of bringing it into the one of the participating countries. Ownership has varied in each case: CCRIF is through a purpose trust; PCRIC is through a Foundation; ARC is through a mutual insurance entity. In all cases, a Board of Directors with normal legal and fiduciary responsibilities for a commercial entity oversees the day-to-day operations of the insurance vehicle (via full-time executive management) with greater or lesser operational and/or strategic direction from the participating country representatives. In all three cases, donor financing partners (grant donors in the case of PCRIC and CCRIF and lenders in the case of ARC) sit alongside participating country representatives at the highest governance level.

The main functions of a platform are to manage the technical aspects of the insurance business, and to act as a conduit to the global risk markets. For parametric insurance vehicles, which will be the dominant modality for sovereign risk transfer in Asia-Pacific, the technical expertise is likely to be concentrated in the main reinsurance centres around the world. While it is not necessary at this juncture to identify specific jurisdictions that may be appropriate to house a risk transfer platform, support of regulatory authorities in achieving the overall goals and functions of the platform will be critical.

Drawing on the experiences in other regions, there are no obvious barriers in using a similar model to set up public-private partnership vehicles to act as a risk transfer platform for risk pooling in Asia and the Pacific.

The broad concepts and technical details of disaster risk financing and sovereign risk transfer tend to be poorly understood by Ministries of Finance across the world. Recognising and actively managing the contingent liabilities accruing from natural disaster risk is something that has received very little focus until recently. Thus, there is a need for capacity building and knowledge transfer in a structured and coordinated way to foster peer learning and south-south cooperation as well as to ensure knowledge-sharing of best practices. Four areas in particular require attention:

- Risk understanding, based on hazard and risk modelling and including early warning
- National risk financing strategy development and implementation
- Coordination with broader disaster risk management programmes and strategies
- Technical aspects of parametric insurance, and insurance business practices

While larger countries may develop internal capacity to fully manage their needs, smaller countries will likely require ongoing specialist technical assistance over a long period in order to embed disaster risk financing within existing budgetary and financial management processes.
5.3 Role of ESCAP

As outlined above, and highlighted by the ESCAP Secretariat in its paper to the fifth Session of the Committee on Disaster Risk Reduction92, the expertise that ESCAP can bring adds significant value to the implementation of disaster risk transfer solutions across the Asia-Pacific region:

- **Being a trusted partner** to all countries considering disaster risk financing and risk transfer within their broader economic and development planning frameworks. The sustained use of sovereign risk transfer instruments, especially via a regional pool will only be achieved and the corresponding resilience gains materialized, if the socio-economic basis for deploying such resources is understood and embraced at the political and technical levels within government. Developing evidence and making the case for deploying such resources through a focused and committed programme could be the most critical role that ESCAP plays, and one that it is uniquely positioned to undertake.

- **Providing access to a Trust Fund** that provides seed grant financing to support risk transfer vehicles, including pooling mechanisms where appropriate. The Multi-Donor Trust Fund for Tsunami Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries has a 10 year track record, and could be adapted through an opening of separate windows to act as the main Joint Disaster Insurance Fund for the Asia-Pacific region, or a separate trust fund could be set up.

- **Hosting of a Technical Assistance Facility** within and for the region. The experience that ESCAP brings in delivering technical capacity building, its existing focus on economic issues, and longstanding relationships with key Ministries (Finance, Economy, Planning); and the ability to fund a technical assistance facility via the existing or a new Trust Fund make it an attractive option to host a technical assistance facility.

- **Providing a clearinghouse for knowledge and expertise**. This may be done as part of a technical assistance facility or separately, but ESCAP brings particular value as a convenor in sharing knowledge and expertise, both from within the region, from across the UN system, and from bi-lateral and multi-lateral partners.

- **Coordinator for donor inputs**. Implementation of risk transfer mechanisms at the sovereign level will, in most cases, require support from development partners. As has been described above, there is no shortage of appetite from partners to engage in disaster risk financing in Asia-Pacific, but the landscape remains complex, and there is currently no single point of contact which can bring together the different actors both on the recipient and on the donor side.

Given these and other factors, ESCAP is uniquely positioned to act as the focal point and facilitator of the expansion of disaster risk financing across Asia-Pacific through the creation of a Regional Facility on Financing for Disaster Risk Reduction (RFF-DRR). A model for ESCAP engagement is presented below.

5.3.1 Engagement model for ESCAP via a regional facility

The overall aims of the Regional Facility on Financing for Disaster Risk (RFF-DRR) will be to provide services to enable the implementation of all four elements of the model presented in Figure 10 and described in section 5.2. Those services will include both financial and technical elements, and the RFF-DRR should endeavour to build partnerships with relevant institutions across the region and beyond to ensure its work complements and builds upon the many existing initiatives.

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92 UNESCAP, “Disaster risk transfer mechanisms: issues and considerations for the Asia-Pacific region” (see footnote 7).
As has been elaborated above, ESCAP will play a pivotal role in bringing together government partners on their own, as well as with bilateral and multilateral development partners. As a UN agency, ESCAP is uniquely positioned to leverage the “One UN” concept to bring partner UN entities into the discussions and resulting actions, and also to facilitate south-south cooperation, ensuring experiences in other regions (Caribbean, Central American and African) are taken into account in discussions on risk financing in Asia-Pacific.

A suggested roadmap for the launch of a Regional Facility is laid out below.

**Fundraising**

The activities of the Facility will require funding, both to support technical work in its broadest sense but also to allow early availability of seed risk capital to launch risk pooling vehicles. Experience suggests that a multi-donor trust fund (MDTF) which automatically scores ODA for contributions is the preferred format for such a funding vehicle. This would allow the widest range of bilateral and multilateral donors to provide funding, as well as the funding of technical work – a practise well-established within MDTFs. The use of a MDTF as seed risk capital for an insurance vehicle, however, would be somewhat novel. Box 5.1 describes a model for using a MDTF in such a manner. As already discussed above, it is likely that multiple vehicles will be needed to meet the requirements of different regional groupings and their particular risk financing needs. A useful role of the Facility will be to establish a best-practice governance and organisational template so that start-up costs could be minimised. It may be possible to identify and foster shared services which could be provided across multiple insurance vehicles to reduce costs.

**Box 2: Multi-donor trust fund capitalizes public-private risk pooling vehicle**

Practical experience has shown that risk pooling vehicles operate more efficiently and effectively, and have the best opportunity to become sustainable when they are set up within the private sector. They are able to easily utilise the well-established private sector services required to operate a licensed insurance entity, as well as seamlessly access the global risk markets. Thus far, in the interests of maintaining trust with the States within the risk pool, and to deliver the lowest possible insurance premium, multi-State risk pooling vehicles have been set up as either mutual (i.e. effectively owned by the policy-holding States) or standard insurance companies, though wholly owned by a Trust or Foundation in which the participating States are the beneficiaries of the Trust / Foundation.

But even with such ownership structures in place, public-sector development partners have been reluctant to put risk capital (particularly in the form of grant funds) directly into such vehicles given their lack of governance or operational history. Therefore, an alternative mechanism has been devised and implemented, which allows for funds in a multi-donor trust fund to be recognised by an insurance regulator as risk capital, for capital adequacy purposes, even though it does not sit on the balance sheet of the insurance entity. For this to occur, the insurance entity must have a signed grant agreement with the Trustee of the MDTF, which lays out the conditions under which funds from the MDTF can be used to reimburse (or pay directly) the insurance vehicle for incurred costs.

As the insurance vehicle begins operations, it collects premiums for the risk it is underwriting, which it takes as income. Its own costs, comprising of operational/administrative costs, and reinsurance costs (assuming that reinsurance is used) which will be the norm and, where applicable, the cost of paying claims, are eligible for reimbursement from the MDTF.
Opportunities for Regional Cooperation in Disaster Risk Financing

Funding for technical activities is likely to be readily available both on a stand-alone basis and linked to provision of risk capital. The World Bank and the Asian Development Bank provide substantial technical assistance funding opportunities to support both their own work and the work of partners and consultants. It is understood that ADB also has specific funds for risk capital on a regional basis. Both ADB and World Bank also make available concessional financing through the normal bi-lateral country envelopes, some of which may be eligible for use to support premium payments by countries, and for technical assistance work in that country.

However, bilateral donors are likely to be key partners from a funding perspective, with the InsuResilience Global Partnership being the primary vehicle for engagement with interested donors. The KfW Insurance Solutions Fund and the DFID-supported Centre for Global Disaster Protection are existing funding channels which should be explored, while other bilateral donors will likely continue to be active in this area, notably the European Union, Japan, Sweden and Switzerland, with France, Canada and the United States as well as emerging regional actors such as South Korea, China, New Zealand, Australia and Singapore.

Secretariat and core technical team

The RFF-DRR will need a Secretariat to serve multiple roles: an administrative unit for the Facility, a coordinator and facilitator of partnerships and collaborative opportunities, and a core technical team to ensure consistency and maintain institutional knowledge.

Funding should be established for a multi-year period (3 to 5 years is recommended) with a senior official leading the Secretariat and taking responsibility for delivering regional progress in support of the Sendai Framework, the Paris Agreement and the Sustainable Development Goals. While ESCAP may provide the core staffing, secondments from partner organisations could be used to bring together a team that reflects the multiple approaches currently across the region.

It will be important to establish a core set of analytical tools which have value across the region, not only to understand and quantify natural disaster risk in an open and transparent way,
but also to support countries in developing risk financing strategies that focus on fostering economic resilience. Partnerships with the World Bank and with industry groups like the Insurance Development Forum (and in particular the Risk Modelling and Mapping working group of IDF) will be important to ensuring that existing work is recognised and utilised. Domestic agencies in many countries have also been involved in developing quantitative views of risk, and these should be recognised and further enhanced so that they are appropriate for use in a regional context as well.

While a core technical team is critical, external consulting resources will also be needed to capture global experience and expertise in what is a quite specialised area of development financing work. Annex 1 sets out a guide to technical resources available.

**Building on existing ideas and programmes**

To be successful, the RFF-DRR must recognise and complement existing ideas and programmes, rather than rival or divert resources from them. At this stage, it is not possible to foresee how this might materialise, but the following programmes and ideas have achieved recognition among donors and practitioners in disaster risk financing and sovereign risk transfer, and as such should be considered important early linkages for RFF-DRR.

- **PCRIC**: Already operating, now as a stand-alone entity, but has faced challenges in expanding the number of participating Pacific Island States and its scale of coverage accessed by States.

- **SEADRIF**: Three States have already committed to joining this World Bank supported initiative, with World Bank funding already agreed and flowing through country envelopes as well as for pooled technical assistance.

- **KfW Insurance Solutions Fund Concept for ASEAN via enhanced financial resources for AHA Centre**: A concept paper has been presented to ASEAN via the Committee of Disaster Management (ACDM) and via the Cross-Sectoral Coordination Committee on Disaster Risk Financing and Insurance, and appears to be the most concrete proposal amongst a number of broad concepts which have been discussed within ASEAN as part of the Disaster Risk Financing and Insurance (DRFI) Roadmap initiative.