



DISASTER RISK IN ASIA AND THE PACIFIC

ASSESSMENT, MANAGEMENT, AND FINANCE

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6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 632 4444; Fax +63 2 636 2444
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Acknowledgments

The first two proceedings described here were held in Manila, Philippines and Kuala Lumpur, Malaysia in September 2015 with the third in Taipei, China in April 2016.

Appendix 2 contains the agendas and lists of participants involved during these important events.

Asian Development Bank (ADB) and Organisation for Economic Co-operation and Development (OECD) Forum on Disaster Risk Financing for Inclusive Development 15–16 September 2015 at ADB Headquarters, Manila, Philippines

The purpose of the forum was to identify options to share practice and experience in strengthening financial resilience against disasters—to better safeguard economic growth and development. The forum highlighted ADB’s initiatives and financing products, and shared country experiences of financial management of disaster risks from the Asia and Pacific region as well as from Latin America and the Caribbean. These successful approaches help identify opportunities to work together, develop policies and disaster risk financing instruments to better manage fiscal risks of disasters.

Global Seminar on Disaster Risk Financing: Developing Effective Approaches to the Financial Management of Disaster Risks, 17–18 September 2015, Kuala Lumpur, Malaysia

This seminar was co-hosted by the ASEAN Insurance Training and Research Institute (AITRI), Bank Negara Malaysia, ADB and OECD in co-operation with the Government of Japan. It helped establish a framework for the development of disaster risk financing strategies by identifying the constraints, quantifying the exposure, supporting the capacity of the government as well as insurers to develop disaster risk transfer markets and tools. It offered an opportunity to exchange knowledge and practices on financial protection against disaster risks among officials and experts from the OECD, Asia-Pacific Economic Cooperation (APEC), ASEAN and other invited economies in Asia and elsewhere, regional and international organizations and the private sector.

11th Annual Conference Asian Forum of Insurance Regulators, 22 April, 2016, Taipei, China

The conference examined both the effects of climate change and disaster risk financing from a regulatory perspective—with an emphasis on the insurance industry. It discussed how to reduce the protection gap for climate related risks and discussed the role that ex-ante (pre-loss) financing instruments, including insurance, reinsurance and capital markets risk transfer tools can play to meet immediate liquidity needs for emergency response, recovery and reconstruction post- catastrophe.

We would like to thank the many people involved in organizing these events, the presenters and participants who all work toward the goal of building resilient disaster risk financing systems that help countries avoid the worst of a crisis’ financial impact while keeping hard won development gains on track.

Abbreviations

ADB	Asian Development Bank
ADF	Asian Development Fund
AFIR	Asian Forum of Insurance Regulators
AITRI	ASEAN Insurance Training and Research Institute
APEC	Asia-Pacific Economic Cooperation
APRA	Australian Prudential Regulation Authority
APDRF	Asia Pacific Disaster Response Fund
ASEAN	Association of Southeast Asian Nations
BANOBRAS	Banco Nacional de Obras y Servicios Públicos (National Works and Public Services Bank)
BCCTF	Bangladesh Climate Change Trust Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
CAT	Catastrophe
CATDDO	Catastrophe Deferred Draw Down Option
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CGC	Credit guarantee corporation
COSEFIN	Council of Ministers of Finance of Central America, Panama and the Dominican Republic
CRED	Center for Research on the Epidemiology of Disasters
CRIP	Climate Resilience Improvement Project
DEAP	Disaster and Emergency Assistance Policy
DMC	Developing member country
DRF	Disaster risk financing
DRM	Disaster risk management
DRR	Disaster risk reduction
EM-DAT	Emergency events database
ESG	Environment, social and governance
FONDEN	Fund for Natural Disasters
GDP	Gross domestic product
GLOF	Glacier Lake Outburst Floods
GIROJ	General Insurance Rating Organization of Japan
IAIS	International Association of Insurance Supervisors
ICP	Insurance core principle
IDRA	Insurance Development and Regulatory Authority
IDRM	ADB's Integrated Disaster Risk Management
OECD	Organisation for Economic Co-operation and Development
OFDA	Office of U.S. Foreign Disaster Assistance
PML	Probable maximum loss
RBC	Risk-based capital
RMS	Risk Management Solutions
SEGOB	Secretaria de Gobernacion
SMEs	Small and medium-sized enterprises
SPC	Segregated portfolio company
SPRV	Special Purpose Reinsurer Vehicle
STFI	Storm, tempest, flood and inundation

Assessing Climate Change and Disaster Risk

Climate change and disaster risk in Asia and the Pacific is increasingly important to governments when defining development priorities for the region's most affected economies.¹ Ways to assess, manage and prepare finance to cover those risks have gained in depth and sophistication, especially over the past decade. Yet implementing those strategies and taking best practices to the field—from vulnerable coastal regions and island economies to agricultural heartlands and rapidly expanding cities—remains an urgent challenge for governments, the private sector, and households. Most recognize the problem, while systems to prepare for and respond to disasters have been formulated. Now practice needs to catch up to theory amid growing vulnerabilities. For most of Asia and the Pacific, although work has accelerated and institutions are taking shape, there remains much to do before preparation and response are up to the task.

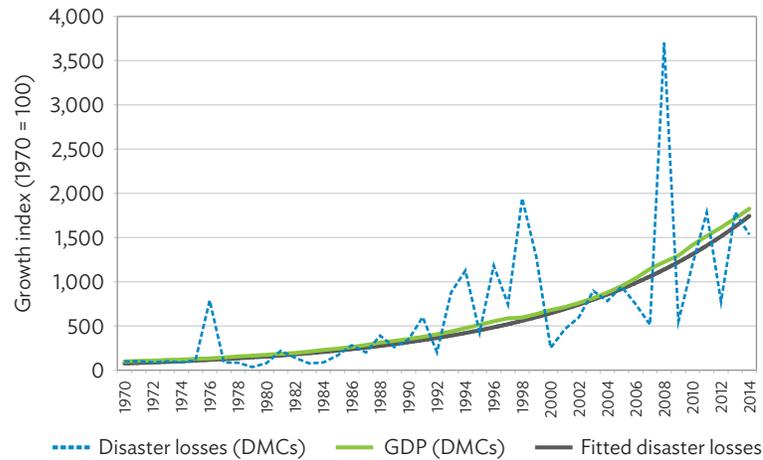
The urgency is real. Overall, weather-related disasters are becoming more frequent with greater severity. Climate change and deeper cyclical conditions like the El Niño phenomenon and monsoons are factors. Cities, coastal regions, flood plains and islands are increasingly at risk. Weather-related disasters range from typhoons and cyclones to floods, drought, and heat waves. Add geological disasters like earthquakes and associated tsunamis, along with volcanic eruptions across the “ring of fire,” and the risk in Asia and the Pacific to climate change and disasters grows higher than any other part of the world. According to EM-DAT: The OFDA/CRED International Disaster Database (www.emdat.be), compiled by the Université Catholique de Louvain, Brussels, in the 10 years from 2006–2015, more than 361,000 lives were lost in the region and 1.3 billion people were affected by disasters. That is 57% of people directly affected globally. Aside from vast human suffering, disasters in the region caused \$727 billion in direct physical losses. Losses in ADB developing member countries averaged a staggering 126 million per day.²

Each country or territory faces its own set of disaster risk and climate change elements. The diversity is palpable. It ranges from high frequency, low severity annual floods and storms to low frequency high severity catastrophic earthquakes, volcanic eruptions, super-typhoons and wide-spread flooding that require large-scale, quickly deployed international relief. Along with climate change, rapid urbanization adds to the disaster and climate change impact. It increases potential

¹ This paper summarizes key presentations at the ADB-OECD Forum on Disaster Risk Financing, held 15–16 September 2015 at ADB headquarters in Manila, Philippines, the Global Seminar on Disaster Risk Financing: Towards the Development of Effective Approaches to the Financial Management of Disaster Risks, held in Kuala Lumpur, 17–18 September 2015, and the Asian Forum of Insurance Regulators (AFIR) Roundtable, 22 April 2016, held in Taipei, China. Agendas and corresponding lists of presenters are included in Appendix 1.

² D. Guha-Sapir, R. Below, Ph. Hoyois - EM-DAT: The CRED/OFDA International Disaster Database - www.emdat.be - Université Catholique de Louvain - Brussels - Belgium.

Figure 1: Disaster Losses Are Growing at the Same Rate as Gross Domestic Product in ADB's Developing Member Countries



ADB = Asian Development Bank.

Note: Covers ADB DMCs up to 2014.

Source. Asian Development Bank.

exposure of assets to natural hazards, in turn contributing to higher household and business disaster risk if the assets are not sufficiently resilient.

Globalization and technology deepen value chains and production networks to the great benefit of producers and consumers—both domestic and foreign. But it also means that, above the direct human cost and immediate structural damage, preparation and response to disasters must cover everything from local crop and fishing fleet damage to domestic and global supply-chain disruptions—supplies of gadgets in New York shops are affected by floods in Thailand. In short, disaster risk has local and global impact. That is why managing and financing that risk is in everyone's interest.

Asia's Disaster Risk Management and Financing

Most governments in Asia and the Pacific have disaster risk management (DRM) systems—many with focal point government agencies backed by an array of institutional and legislative support (Appendix 1A). Some involve private sector participation and are developing insurance/reinsurance components. Many are spread across jurisdictions—from informal community cooperation to local government initiatives to formal cross-agency government structures (Appendix 1B).

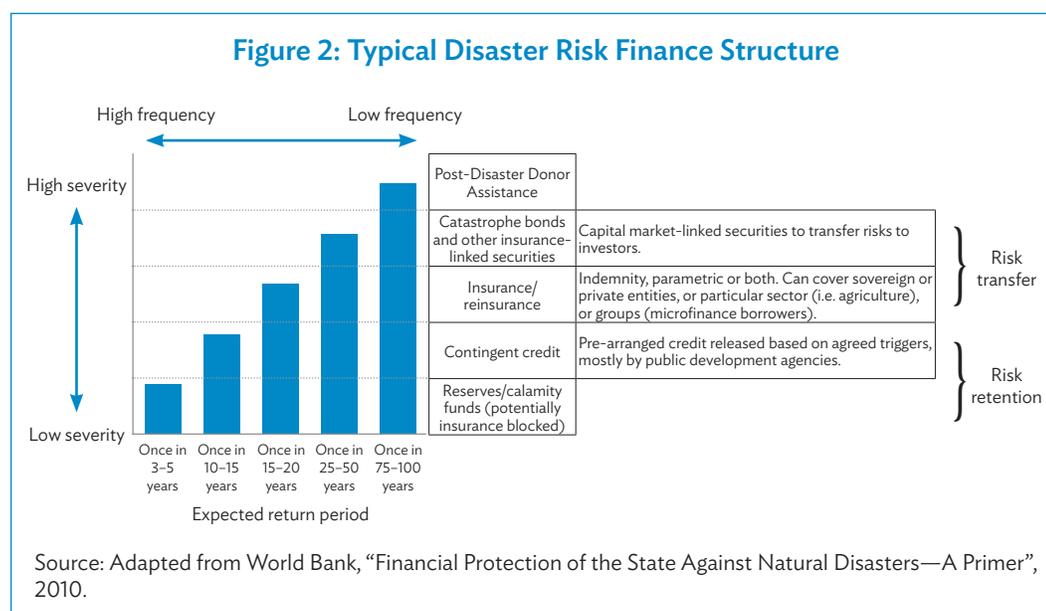
These DRM systems, structures and support are as diverse as the risks themselves. Some have well-defined functioning DRM systems developed over many decades (Japan). More recent and destructive disasters in others have jolted governments into action, using newly available technology to catch up in building risk management systems (the Philippines, Indonesia and India, among others). Still others are forced to confront disasters with few available self-generated resources to run effective DRM systems without large donor assistance (Pakistan, Nepal, and Pacific island countries like Fiji and Vanuatu, for example). All systems must find their own niche within government hierarchies—if not standalone—to coordinate and facilitate cooperation between ministries and agencies.

But despite this diversity, there are commonalities. Over the past decade or so there has been greater drive to share experiences and lessons learned. So as governments work to define, measure, value, reduce and insure risk, steps can be taken to use these assessments to strengthen vulnerable assets, establish immediate response mechanisms, and provide for timely disbursements where it is needed most. And for those facing similar risk exposure and vulnerabilities—such as with island nations—cooperation and risk pooling can develop effective regional public goods.

One of those recognized commonalities is that disaster risk reduction (DRR) models, government DRM systems, and disaster risk financing (DRF) structures must be closely aligned to the specific risks and vulnerabilities each locality faces—both for *ex ante* prevention and preparedness, and for *ex post* disaster response.

A typical disaster risk financing (DRF) system requires a layered public-private sector approach, covering (i) risk retention—e.g., annual set-aside government budget reserves and calamity funds (plus contingent credit facilities); (ii) risk transfer—government and private insurance and reinsurance markets, along with catastrophe bonds and other insurance-linked securities; and (iii) post-disaster assistance—mostly external government and private donor-driven. Fortunately, best practice structures exist to handle exigencies. They tend to be adapted to individual country circumstances, and can vary by locality. Yet most in developing Asia remain at an early stage and must mature or be developed further to quickly supply sufficient liquidity and other assistance when disaster strikes—or predefined triggers (parametric levels) are breached. An array of disaster

risk financing instruments can be designed and offered. They should be risk based, not designed solely on the basis of the severity and frequency of previous natural calamities. DRF reduces country, business, community or household exposure to disaster-related losses by transferring or sharing risk through specifically designed financial instruments (Figure 2).³



The most effective ex DRF strategy uses a “bottom-up” approach to segment disaster risk. A rigorous analysis of the underlying hazard, exposure and vulnerability measures the probable maximum losses from events over varying return periods. The strategy should then match layers of disaster risk with the most cost-effective financial instrument, based on economic and social considerations. This creates a menu of ex ante and ex post financial instruments. Reserves and budget contingencies are the least expensive and generally cover recurrent low-risk losses. Other financing sources, such as contingent credit—and possibly insurance—are best suited to medium layers of risk. Finally, less frequent but more severe high risk disasters can be financed through usually more expensive risk transfer instruments, such as (pooled) catastrophe risk reinsurance or catastrophe bonds, among others, and international assistance.⁴

Thus, creating a workable, efficient, and sufficiently funded DRF structure should be based on rigorous and robust risk assessments that help define the frequency and severity of loss. That way it is possible to develop disaster risk models and deploy finance mechanisms more selectively and strategically. The critical nexus is to link specific DRF instruments with the handling of DRM. It not only adds resilience to financial protection, but simultaneously reduces risk as well. The more seamless the two are linked, the better DRF instruments can provide price signals to help guide other resilience-related decisions—when the marginal cost of further disaster preparedness or reduction exceeds risk transfer costs (see footnote 5).

³ http://inclusiveinsuranceasia.com/docs/DRF_Study_Report.pdf

⁴ https://aric.adb.org/pdf/aeim/AEIM_2014April_ThemeChapter.pdf

As with DRM, DRF structures in Asia are diverse in development and depth. Three country structures underscore this diversity—Japan, the Philippines, and Pakistan:

- (i) Starting over a century ago, **Japan**⁵ has built highly developed institutions covering public awareness and education, preparation and prevention. It has a system of reserves, insurance structures (see Figure 6), emergency response, rehabilitation and reconstruction. Nonetheless, despite all this effort, it was still stretched beyond limits by the extreme 2011 Great Tohoku earthquake, tsunami, and nuclear power meltdown.
- (ii) Archipelagic **Philippines**⁶ is highly exposed to typhoons, floods, drought, earthquakes and volcanic eruptions. It has very high urban concentrations—the extensive capital of Metro Manila and more tightly knit provincial centers, along with long coastlines, agricultural plains and mountainous regions exposed to landslides. Following a series of devastating urban storm-related floods and super-typhoons, DRM and DRF have been given greater government priority (Figure 3). The government has developed a national strategy addressing disaster risk at national government, local government and individual levels, and is increasingly conducting awareness campaigns for both weather-related and earthquake preparedness (especially in Manila).
- (iii) **Pakistan**⁷—though not new to earthquake disasters and weather-related droughts, floods and heat waves—is in the process of building institutions and assessing insurance structures that can be more effective in handling disaster risk and response. The government is in the process of operationalizing its National Disaster Management

Figure 3: Philippine Disaster Risk Financing and Insurance Strategy

DEVELOPMENT OBJECTIVES	
	<ul style="list-style-type: none"> • maintain fiscal health • develop sustainable financing mechanisms • reduce impact on the poorest, most vulnerable, and shield low-income families
STRATEGIC CONTEXT	
Priority Areas:	
National	Financing post-disaster emergency response, recovery, and reconstruction
Local	Funding local governments for post disaster recovery and reconstruction
Individual	Helping poor, vulnerable households and small and medium-sized enterprise owners quickly restore livelihoods

Source: “Enhancing financial preparedness for management of disasters in The Philippines”, Presentation by Stella Laureano, Department of Finance, Philippines.

⁵ From the presentation by Noriyuki Mita, Ministry of Finance, Japan, at the September 2015 ADB-OECD Forum on Disaster Risk Financing.

⁶ From the presentation by Stella Laureano Department of Finance, the Philippines, at the September 2015 ADB-OECD Forum on Disaster Risk Financing.

⁷ From the presentation “Fiscal disaster risk assessment options for consideration in Pakistan”, by Nasreen Rashid, Insurance Expert, Pakistan, at the September 2015 ADB-OECD Forum on Disaster Risk Financing.

Authority, implementing a more holistic approach to DRM, thus moving beyond its traditional post-disaster funding approach. Some 50% to 60% of total relief and recovery spending currently comes from donor funding. There remains a huge resource gap that needs to be filled over time as its DRM system becomes more institutionalized.

What Needs to Be Done

The challenge for developing Asia—and it is a difficult one—is to match local needs through national strategies with increasingly accepted international standards.⁸ Over time, a comprehensive DRM system helps develop DRF instruments in the market. And developing a system’s effectiveness can take a long-time—Japan’s took over a century. Confidence and trust must be built. Risk awareness must spread through various (including social) media. It must be understood by government, business, communities, and households. The education process needs to begin early. DRM and DRF must account for specific circumstances—for example, collecting vast repositories of data for each locality; defining different risks and level of development of both the economy and society. Without an enabling environment, effective, sustainable, and widely utilized DRF instruments cannot evolve.

Disaster Risk Management

DRM encompasses both *ex ante* disaster risk reduction and preparedness along with *ex post* disaster response.

Ex ante, the prerequisites for effective DRM are three-fold. First, they include risk identification. This requires risk assessment through data collection and rigorous risk evaluation. And it encompasses making the risks widely and publically understood through both the education system and sponsored media campaigns. Second, it includes risk reduction through prevention. There is a huge infrastructure deficit in rapidly growing developing Asia. New and refurbished infrastructure should be designed with international best practices in mind, to meet evolving, more stringent national regulatory standards—including those on disaster resilience—whether via public investment, private construction or public-private partnerships. Land use planning and conservation must have a risk reduction component. And third, effective DRM must include an in-place preparation structure with prearranged and planned logistics for rapid emergency response (Box). Here, the use of new technology allows for far more accurate early warning systems, including communication system backups that ensure information is disseminated widely so people can adequately prepare without panicking. This needs to run from the government and corporate sector down to communities, schools and households—including contingency planning, drills and exercises.

Ex post, the requirements for effective DRM are also three fold. First they include emergency response. There is some overlap with *ex ante* early warning through more direct interventions

⁸ Collated from a panel discussion at the September 2015 ADB-OECD Forum on Disaster Risk Financing. Members included Bruno Carrasco, Noritaka Akamatsu, Betty Wilkinson, Arup Chatterjee, Charlotte Benson from the Asian Development Bank, and Salvador Perez Maldonado (Secretaria de Hacienda y Credito Publico, Mexico), Noriyuki Mita (Ministry of Finance, Japan), and Stella Laureano (Department of Finance, Philippines).

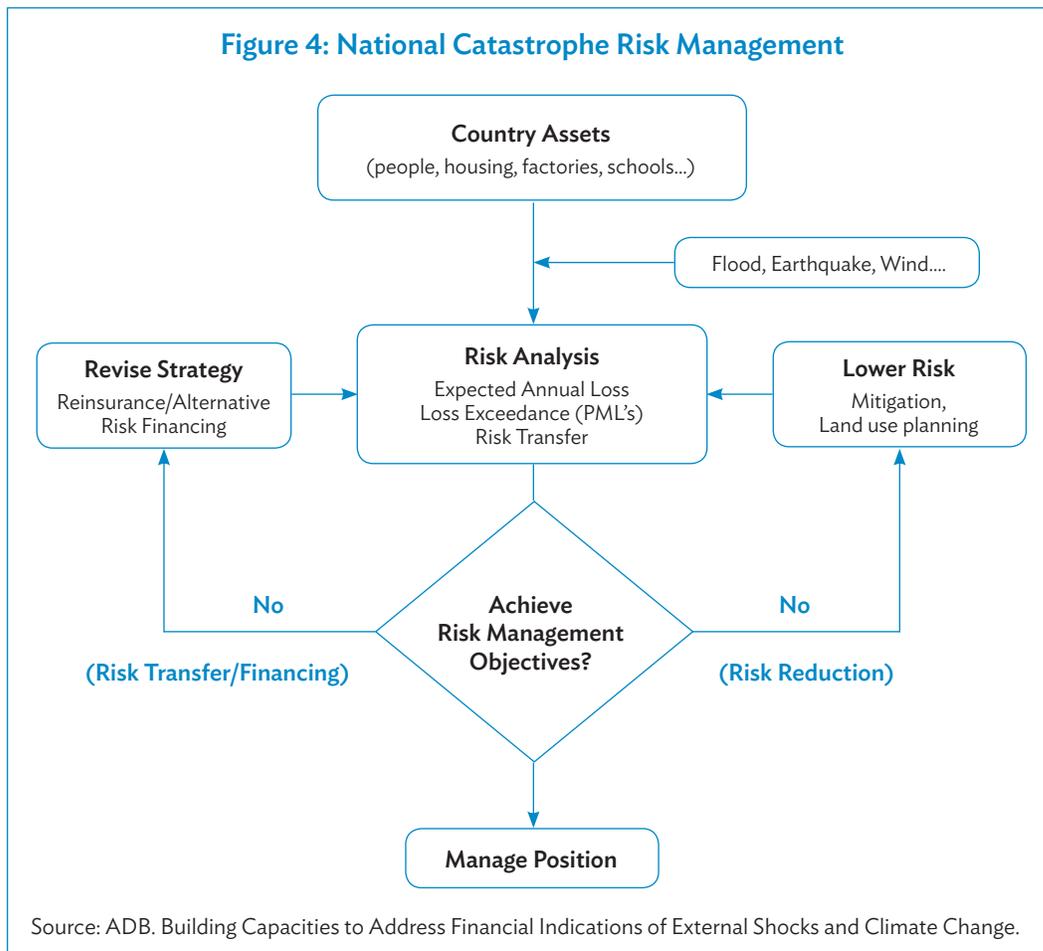
Box: Preconditions for Ensuring an Effective Disaster Risk Management Structure

The experience from advanced countries and successful DRM systems in emerging economies in Latin America, for example, shows several preconditions needed for ensuring an effective DRM structure.^a

1. Political commitment—disaster preparedness needs to rise among government priorities within development strategies; for example, in the composition of DRM-related budgets increasing for prevention and preparedness, mitigation and adaptation.
2. Defining risks, collecting data by risk and locality—from ground field data to risk and damage assessment tools from satellites and eventually drones.
3. Public awareness—education and participation; concerted efforts from both governments and the private sector.
4. Regulation and policy—build on what exists (from family systems to local cooperatives to insurance and government systems).
5. Use of insurance and markets (public, private, micro-insurance); draw informal systems into formal structures—financial literacy, trust and confidence in the insurance industry and markets (insurance ratings, etc.). These take years if not decades to inculcate. Financial protection (insurance) is an integral part of DRM, but only one part of a comprehensive system.
6. And there must be increasing confidence and trust in government, institutions, and markets.

Sources: Collated from presentations by Salvador Perez Maldonado Secretaria de Hacienda y Credito Publico, Mexico; Isaac Anthony, Caribbean Catastrophe Risk Insurance Facility; and Gregorio Belaunde Matossian Ministerio de Economía y Finanzas, Peru.

such as getting vulnerable people to secure property and evacuate to pre-designated or quickly-supplied shelters—such as properly constructed schools or other public structures (whether urban or rural). Rescue operations must be mobilized and practiced from communities to police and military. Second, in the immediate aftermath, health services and living support must be available to affected people (temporary housing and food, among others). Simultaneously, activities involving initial assessments of losses, aid mobilization, and discussing options how recovery will be organized needs to be carried out. Planning how funds for early recovery and reconstruction will be managed and coordinated once they are available is an important aspect of this process. Adequate financial and material resources must be provided throughout the response, recovery, and reconstruction phases. During early recovery—debris must be removed to allow for the restoration of essential infrastructure. And as recovery gains pace, the basic economic services are needed to get industry, companies, small and medium-sized enterprises (SMEs), and household livelihoods back in business. Finally, during reconstruction, the “build back better” mantra leads to job creation as communities are rebuilt, even if it involves relocation and land use readjustment is needed.



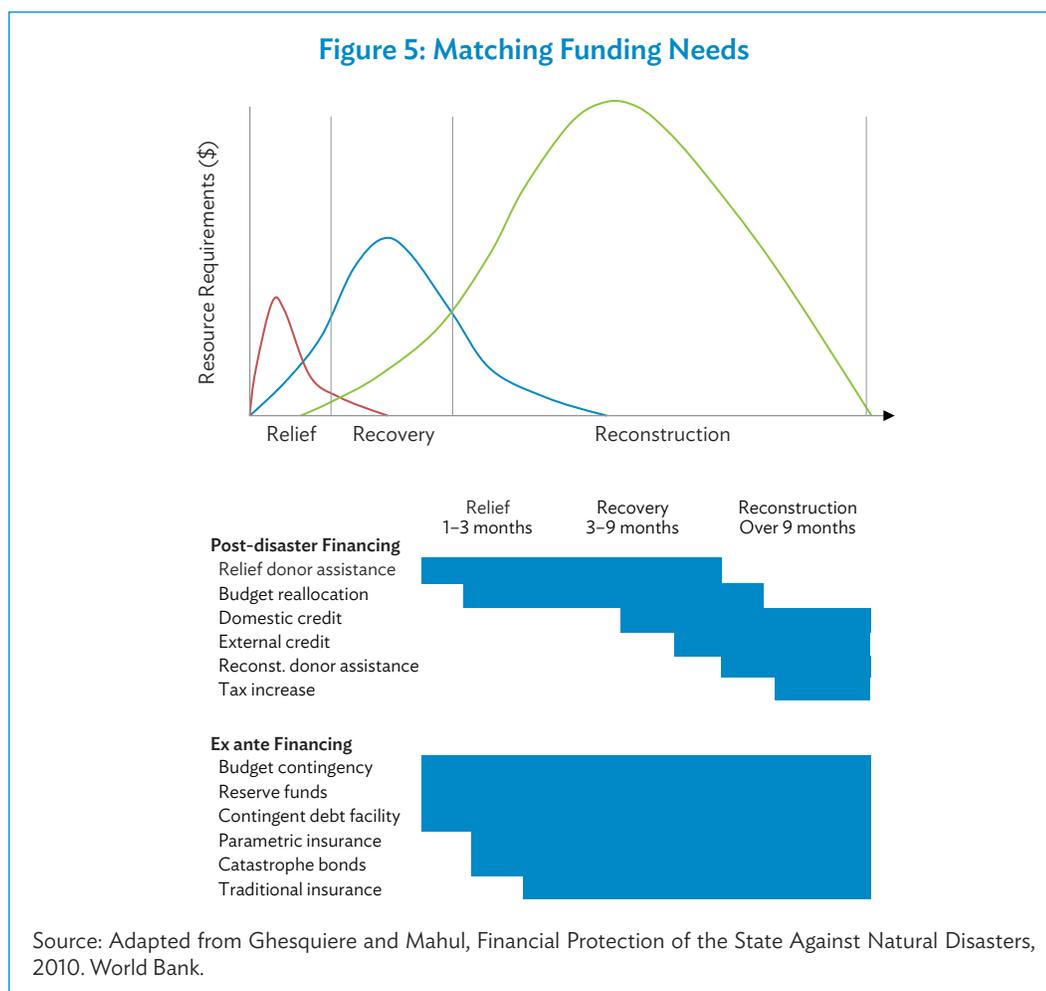
Disaster Risk Financing

DRR and DRF are the two legs of DRM. Coupled in a probability-based risk-layer framework, both these components are useful to policy makers in managing potential impacts of a disaster by striking the right balance between investments to reduce and/or transfer risk. DRF covers the financial aspects of all parts of a comprehensive DRM system. As shown in Figure 2, there are three basic components. To repeat, the first is risk retention. This includes set-aside reserves, special calamity funds that can potentially be insurance backed, contingent credit, or pre-arranged credit that is released based on agreed triggers, mostly available to public development agencies.

Second is risk transfer, which involves insurance and reinsurance structures that can be indemnity, parametric or both. They can cover either sovereign or private entities, or a particular sector like agriculture, or a group of vulnerable people or entities through, for example, microfinance institutions. It also includes catastrophe bonds and insurance-linked securities. These are capital market-linked securities that transfer risks to investors through active, well-developed market mechanisms.

And finally, there is post-disaster donor assistance, which is mostly used for low frequency high severity events like major typhoons or earthquakes.

The importance of linking risk management with risk financing is essential for the system to be effective and for liquidity to be made available efficiently—and in sufficient amounts to cover the progression of needs—national, public and private, local, community and household risks (Figure 5). The challenge is how to utilize a wide range of instruments to address the costs of disasters and ensure they are available when needed.



What should an effective DRF solutions look like? An effective DRF solution takes an integrated approach by strengthening physical resilience and building financial resilience. Strengthening physical resilience involves investment in risk reduction by focusing on promoting and financing ex-ante risk reduction projects to local governments, federal government, ministries and agencies based on clear and transparent selection criteria. This type of ex ante—or preventive—risk reduction is rarely pursued on a large enough scale as such funds typically focus on disaster response.

Building financial resilience involves developing a catastrophe risk model with a financial model to quantify the financial exposure of the disasters and find fair cost-sharing rules between the various stakeholders—government, insurers, households, and businesses. This would include mechanisms that provide disaster liquidity through reserves, contingent credit or insurance based solutions using parametric, index or modeled loss triggers

First is (usually government run) insurance systems that are activated to protect public infrastructure asset coverage—the basic post-disaster needs such transport, power, and water. By establishing a contingent financing facility, governments can better plan for possible disaster costs, avoiding potential costly post-disaster budget reallocation. This enables governments to better control their contingent liability related to disasters by providing coverage against catastrophic events for both insured and uninsured households. Designing disbursements linked to actual disaster risk reduction results of projects on the ground encourages use of financial incentives to promote disaster prevention instead of disaster response.

Second is the creation and/or strengthening of safety nets, released again based on triggers, but can be structured down to smaller entities and households to keep the local economy operating in a post-disaster environment. This provides poor households the assurance of receiving financial compensation in the event of a disaster. A strong microinsurance system can be used for this, in many cases built upon existing informal traditional cooperative schemes that have functioned to varying degrees over the decades. This family, subsector and business-driven aid can be absorbed if not replaced through more formal microinsurance structures.

Learning from Others: Developing Disaster Risk Financing in Developing Asia

Developing Asia's heightened exposure to climate change and disaster risk underscores the need for effective, efficient DRM, including DRF systems. The diversity across countries, territories and subregions, among others, leaves a wide array of existing systems at varying stages of development. The common thread is the increased frequency and intensity of climate change and weather-related typhoons, floods, landslides, drought and heat waves. Drivers of increasing risk also include geological events like earthquakes, associated tsunamis, and volcanic activity have raised government priorities to create and institutionalize DRM and DRF systems.

Fortunately, there are useful examples of systems that work relatively well in advanced Asia and developing countries and regions in, for example, Latin America and the Caribbean. Coupled with the application of new technologies and models in disaster risk assessment, reduction, and preparedness—and post-disaster (ex post) emergency response, recovery and reconstruction—developing Asia has the opportunity to build or deepen its DRM and DRF systems without having to reinvent what works. Adapting systems to serve the country-specific mix of potential disasters is essential. But it can be done more effectively when based on lessons learned in other parts of Asia and the world.

This section briefly describes existing systems in Japan, Mexico, and in the multi-country context of the Caribbean. It outlines DRM systems and how they are linked to disaster risk financing—with an emphasis on risk retention, risk transfer, and the need to develop insurance products as a key element of DRF systems.

It then describes developing DRF systems across Asia from the perspective of insurance supervisors and regulators, excerpted from panel discussions held 22 April 2016 at the Asian Forum of Insurance Regulators (AFIR) Roundtable on managing risks from climate change (with participants from the OECD, International Association of Insurance Supervisors (IAIS) and in Australia, Bangladesh and Nepal) and disaster risk (from Taipei, China; India; and Sri Lanka).

Lessons from Japan

Japan has been hit by some of the region's most severe disasters.⁹ And since the 1923 Great Kanto Earthquake—its associated firestorm, tsunami and coincidental typhoon that devastated

⁹ Adapted from "Financial Management of Disaster Risks in Japan," presentation by Noriyuki Mita Ministry of Finance, Japan at the September 2015 ADB-OECD Forum on Disaster Risk Financing.

Tokyo, Yokohama and the Kanto region—it has worked on building a DRM system. It was after the 1959 Typhoon Ise-wan, however, that the system began to develop in earnest throughout the 1960s. And yet, the extreme 2011 Great Tohoku Earthquake, tsunami and nuclear meltdown at the Fukushima power plant clearly overwhelmed the system.

The message for developing Asia is two fold: (i) it takes time to institutionalize a comprehensive DRM system; and (ii) changing exposures and vulnerabilities mean each disaster event exposes new gaps and throws new challenges that must be addressed by adapting and refining existing DRM and DRF systems.

Disaster Risk Management

Japan's DRM system comprises an institutional framework for both pre- and post-disaster risk management. DRM plans include human resource development and capacity building, research and development to incorporate latest technology, and DRF. It includes strong ex ante disaster risk reduction and preparedness. Risk identification is a critical initial component. Aside from using historical data to help determine disaster frequency and severity, risk assessments are made from data collected from specific localities—as the risks in coastal towns, for example, are very different from those affecting farms or urban areas. Data associated with keeping logistics infrastructure operating is also crucial when evaluating risks.

Another important component of Japan's ex ante DRM system is raising public awareness of the different types of natural hazards and their possible impact. How to prepare for, react during, and respond to a disaster starts early in the education process and goes beyond general risks nationally to identifying risks specific to each locality. Drills and exercises for each type of weather or geological shock are practiced systematically.

Risk reduction is carried out institutionally through a regulatory environment that requires public and private investment to promote resilient infrastructure by setting standards for construction, land use planning and conservation, among others. The 1960s saw major legislative measures and laws enacted—including a Disaster Countermeasures Basic Act (the 1961 foundation of Japan's current DRM system), and other like the Soil Conservation and Flood Control Urgent Measures Act (1960), the establishment of the Central Disaster Management Council (1962), Act on Special Finance Support to Deal with Extremely Severe Disasters (1962), a Basic Disaster Management Plan (1963), and Act on Earthquake Insurance (1966), among others.

Being prepared for emergencies and immediate emergency response is another ex-ante prerequisite. Today, early warning systems take advantage of advancements in forecasting, tsunami buoy detectors and the latest technologies in measuring seismic activity, for example, to supply more detailed and accurate data and analysis. Public dissemination, through digital and other information and communication systems, are widespread throughout the archipelago. And beyond education and practice at an early age, contingency planning, drills and exercises are conducted across public and private sector workplaces and households.

Ex post disaster emergency response actually starts with warning systems and evacuation, if required, along with activating preplanned rescue systems and operations. Ready health and living support to those in danger's path include preparation of temporary housing and food supply, for example.

The initial recovery stage involves removal of debris and quick restoration of affected public infrastructure to allow basic economic activities to resume, hastening industrial and economic recovery.

And finally, the longer term “build back better” reconstruction of buildings and restoration of livelihoods (also providing employment) includes rebuilding damage in specific localities and includes, if required, relocation and land readjustment policies as part of the DRM.

Disaster Risk Financing

As in the case of Japan, DRF systems should cover the financial aspects of all parts of a comprehensive DRM system. And often, in the event, how money is used after a disaster is perceived as more critical than how the finance is structured. Thus, a robust DRF structure should be able to release adequate liquidity as needed while retaining sufficient flexibility to readjust or reallocate (as often happens) in budget disbursements. Financial protection (insurance) is an integral part of DRF, but only part of a comprehensive system. And as with DRM, finance is usually structured for pre-disaster (ex-ante) and post-disaster (ex post) requirements.

In Japan, public and private sectors each play important roles. Ex ante, government (or sovereign) DRF derives from ordinary budget allocations that help finance DRM activities. The main expenditures of DRM-related budgets go primarily to prevention and preparedness, especially land conservation. Since the 1960s, it totaled about 5%–8% of Japan’s budget—though it increases the year following major disasters. For the private sector, businesses and households invest to comply with regulatory requirements.

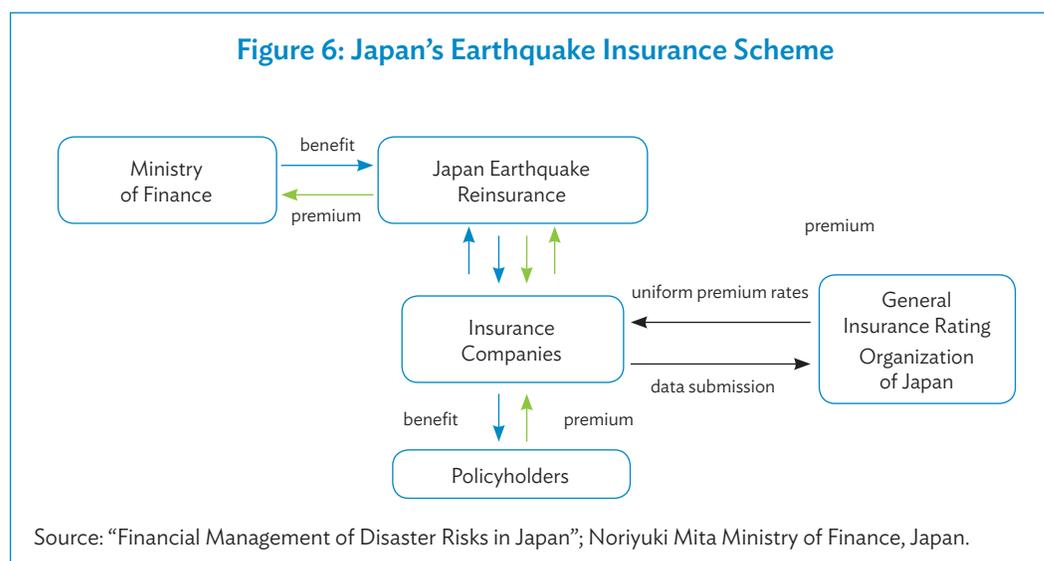
Following a disaster, the government can avail of contingency budgets through reserves or calamity funds, emergency credit lines provided by donors, and—as triggers are surpassed—avail proceeds from risk transfer arrangements via catastrophe (CAT) bonds, risk pooling and other insurance products. The private sector also provides for the release of emergency finance through insurance cover or risk transferred via CAT bonds and other insurance vehicles, for example. Private financial institutions make liquidity available as well, sometimes through special credit lines provided by the government, which provides direct financial support to private financial institutions (local banks) in affected areas. This allows them to provide loans directly or indirectly to affected companies.

As DRF is part of DRM, the links go both ways—the better the understanding of DRM, the better risk financing and transfer systems work. And the deeper DRF systems are, the easier it is for DRM systems to function efficiently. Risk identification, assessments, public awareness, risk reduction, and proven track records of post-disaster disbursements strengthen the DRF system as a reliable, trusted institution. It can take many years to build this confidence.

Japan’s Disaster Risk Financing Insurance Structure

Since earthquake insurance was established in 1966 as part Japan’s DRM development, the government has assumed role as reinsurer and supervisor. It underwrites liabilities that cannot be underwritten by the private sector. Expedious insurance company investigations of damage assessments have led to about 80% of total payments being completed within 3 months of a disaster.

Japan’s “reinsurance scheme” has three components: (i) insurance companies selling earthquake insurance; (ii) the government as reinsurer and supervisor; and (iii) the Japan Earthquake Reinsurance administrator, which handles the earthquake insurance pool, manages and invests liability reserves. Importantly, Japan has an insurance rating agency—the General Insurance Rating Organization of Japan (GIROJ)—that provides uniform premium rates across the industry based on compliance with set standards (Figure 6). Premiums for the earthquake insurance are based on the structure and location of the insured buildings and the insured household goods. Insurance period can be short periods, 1 year or long periods of 2–5 years.



Safety net loans by quasi-government financial institutions—such as Shoko Chukin Bank and the Japan Finance Corporation—offer safety net loans to companies suffering a temporary downturn in business conditions or directly affected by a disaster, often to SMEs. After the first supplementary 2011 budget was approved, the Great East Japan Earthquake Recovery Special Loan for SMEs was launched in May. It moved quickly because the safety net loan scheme was in fact already designed and it could be implemented rapidly.

As with most disaster shocks, the Tohoku earthquake pushed the existing DRM system and DRF into new territory. By 2014, \$229 billion was allocated in four additional supplementary or ordinary budgetary allocations. This provided disaster relief and humanitarian aid, reconstruction work and disaster waste disposal, financial assistance for business and individuals, and job creation programs, among others.

To finance the extra expenditures, the government drew on non-tax revenue dividends. There were also substantial domestic bond issues for infrastructure projects related to recovery from the Tohoku earthquake, sales income from government stock surplus funds, for example. It raised funds through special reconstruction taxes (income tax, corporate tax, and cigarette taxes, and reallocated other expenditures. Credit Guarantee Corporations (CGCs) increased their credit guarantee limits to SMEs. Once the government designates a disaster an “extremely severe disaster,” special financial assistance is made available to affected local governments and SMEs in addition to ordinary disaster financial assistance.

Lessons from Mexico

Mexico's DRM and DRF systems are centered on public finance—which over 25 years has evolved into an efficient structure that identifies and maps risk, invests in prevention, runs a risk transfer system, and issues catastrophe insurance with funds used for emergency relief and reconstruction.¹⁰ The Fund for Natural Disasters (FONDEN)—established in 1996—had the original goal of providing financial resources for federal and state reconstruction without compromising committed government spending. Since then its goals have deepened. Today, FONDEN is a financial tool comprising many instruments, driven by various federal and state government agencies that participate in relief and reconstruction. It primarily provides resources to Mexico's 32 states and to federal agencies in charge of federal infrastructure when a disaster exceeds state or agency budgets. It also uses an R-FONDEN probabilistic catastrophe risk model to simulate disasters and provide risk metrics (such as annual average loss and loss exceedance probability curves). The current FONDEN annual budget is about \$800 million; uses an extraordinary budget if required; runs a \$400 million reinsurance program; has CAT bond cover worth some \$315 million;¹¹ and has government reserves totaling some \$1.490 billion. Federal and state governments in Mexico spend close to \$1.5 billion annually on reconstruction of public assets and low-income housing following disasters. For example, in 2010, major floods required over \$5 billion, mostly for local assets.

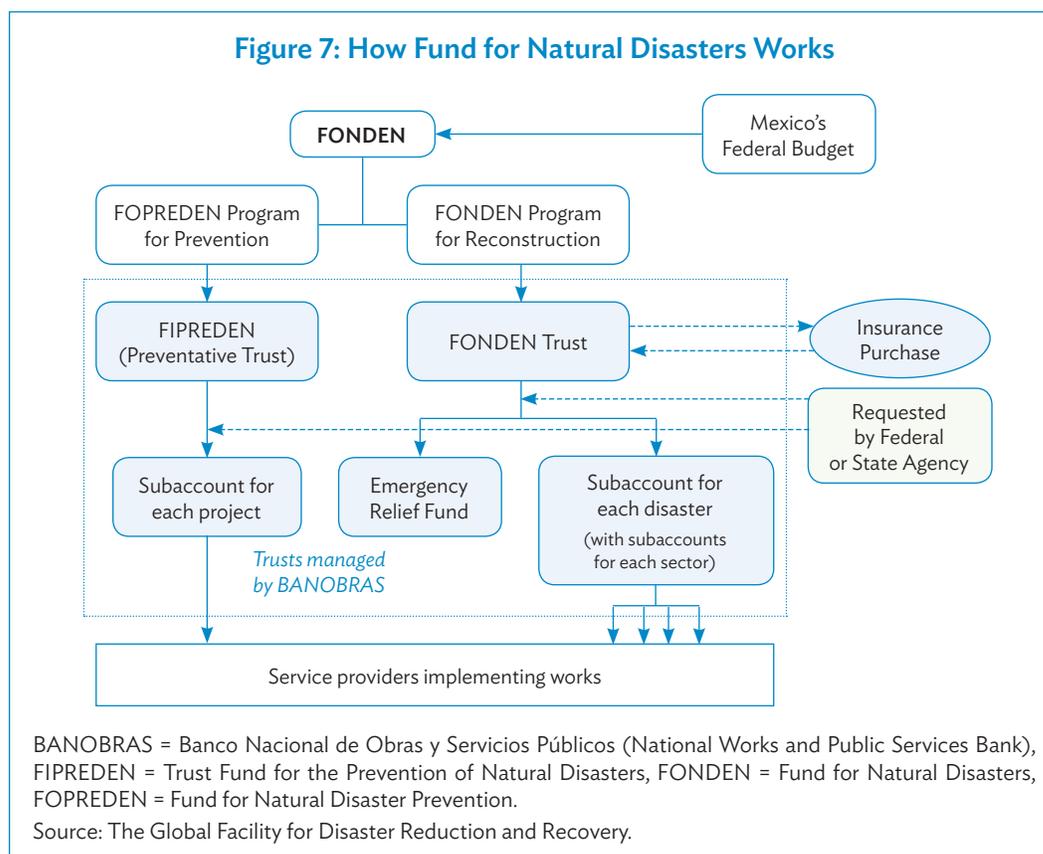
FONDEN resources derive from the federal budget. FONDEN's primary budget account—the Program for Reconstruction—channels resources to the FONDEN Trust and Emergency Relief Fund. It is a layered structure that creates specific financial accounts for each reconstruction program (Figure 7). FONDEN and its related funds (FOPREDEN and CADENA—for agricultural insurance) are allocated by law to cover at least 0.4% of the annual budget, and include uncommitted trust funds from the previous year. FONDEN has grown in complexity and responsibility over time. Today it uses a clear framework for assessing damage and loss, determining resource allocation, identifying funding channels and managing implementation between federal and state government agencies. Additional resources can be transferred from federal surpluses or other programs if funding is insufficient. The National Works and Public Services Bank (BANOBRAS), a state-owned development bank, is the fiduciary. This gives Mexico's DRM system efficiency, transparency, and discipline, while generating public trust—a critical element in building an environment conducive to insurance industry development.

As a federal government financial vehicle, FONDEN prepares *ex ante* for post-disaster response and reconstruction. It supports DRM out of the national budget and helps finance rapid reconstruction of government infrastructure (both federal and state), as well as the reconstruction of low-income housing and recovery of natural environment assets. It is a mechanism that finances both *ex ante* and *ex post* reconstruction and is central in managing disaster response resources across all government levels.

When disaster strikes, specified technical agencies notify the Secretaria de Gobernacion (Ministry of Interior), which declares a state of emergency or disaster. First, emergency relief

¹⁰ Adapted from "Insuring public finances against disasters: The experience of Mexico's Natural Disaster Fund" Salvador Perez Maldonado, Secretaria de Hacienda y Credito Publico, Mexico.

¹¹ Extended from their initial maturity date of 4 December 2015 to 4 March 2016 following Hurricane Patricia. FONDEN received a 50% payout.



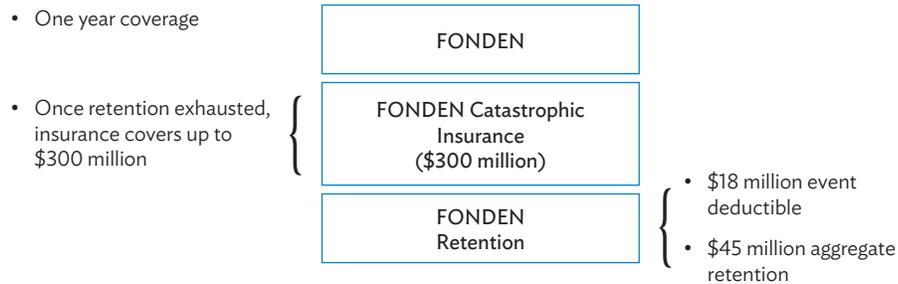
funding is made available, while a disaster declaration triggers a process leading from damage and loss assessments to a reconstruction program. Federal and state agencies affected agree on the program and allocate project-based cost-sharing guidelines. FONDEN initially finances all federal reconstruction and 50% of local assets. The percentage decreases for local assets if insurance is not purchased. A technical committee between the Ministry of Finance and SEGOB approves distribution and instructs BANOBRAS to create subaccounts and commit funds for each project. Contractors doing reconstruction charge sub-accounts directly.

In 2006, the Fund for Disaster Prevention (FOPREDEN) was created to finance disaster risk reduction, from risk assessment (a risk “atlas”) to mitigation (early warning systems for floods) and risk awareness (education materials). Its annual budget is about \$25 million, channeled similarly to FONDEN.

Disaster losses in Mexico vary greatly. About a third of the time funding needs exceed FONDEN resources. So in 2004 a FONDEN Trust was organized to pay premiums and receive loss payments from risk transfer instruments. Mexico’s first catastrophe bond was issued in 2006, followed by MultiCat bonds in 2009, 2012 and an indemnity-based insurance for FONDEN losses. The government has built a disaster risk financing and insurance strategy to cover different layers of risk by complementing FONDEN’s risk retention coverage with more innovative risk transfer instruments (Figures 8 and 9).

Figure 8: Fund for Natural Disasters Catastrophe Insurance Scheme 2015–2016

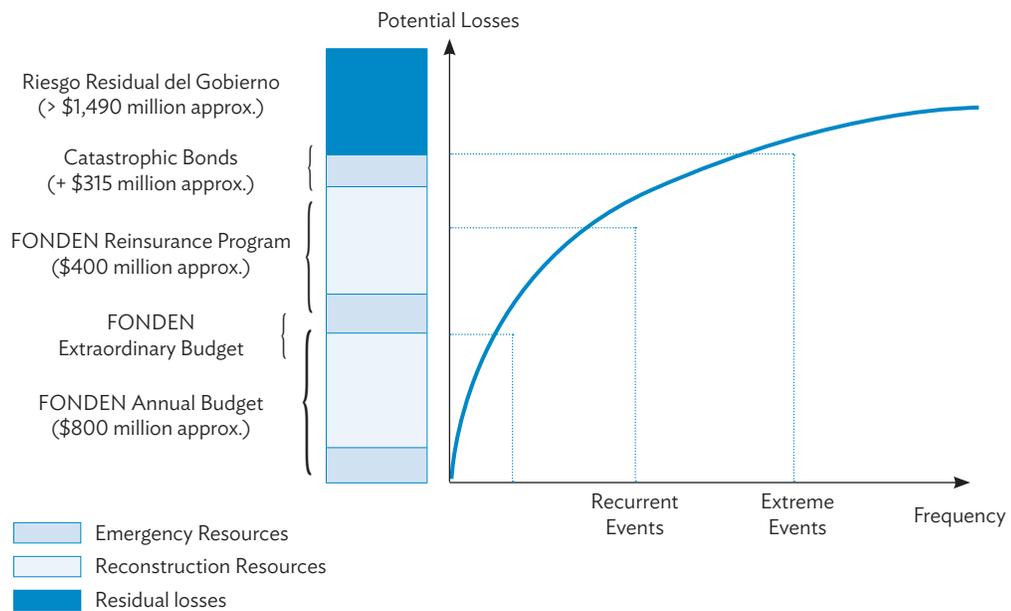
Covers expected loss deviations from FONDEN:



Insurance scheme was first placed in 2011

Source: Risk Management Financial Strategy presentation at ADB-OECD Forum on Disaster Risk Financing for Inclusive Development, Manila, Philippines, 15–16 September 2015.

Figure 9: Fund for Natural Disasters System Model Summary



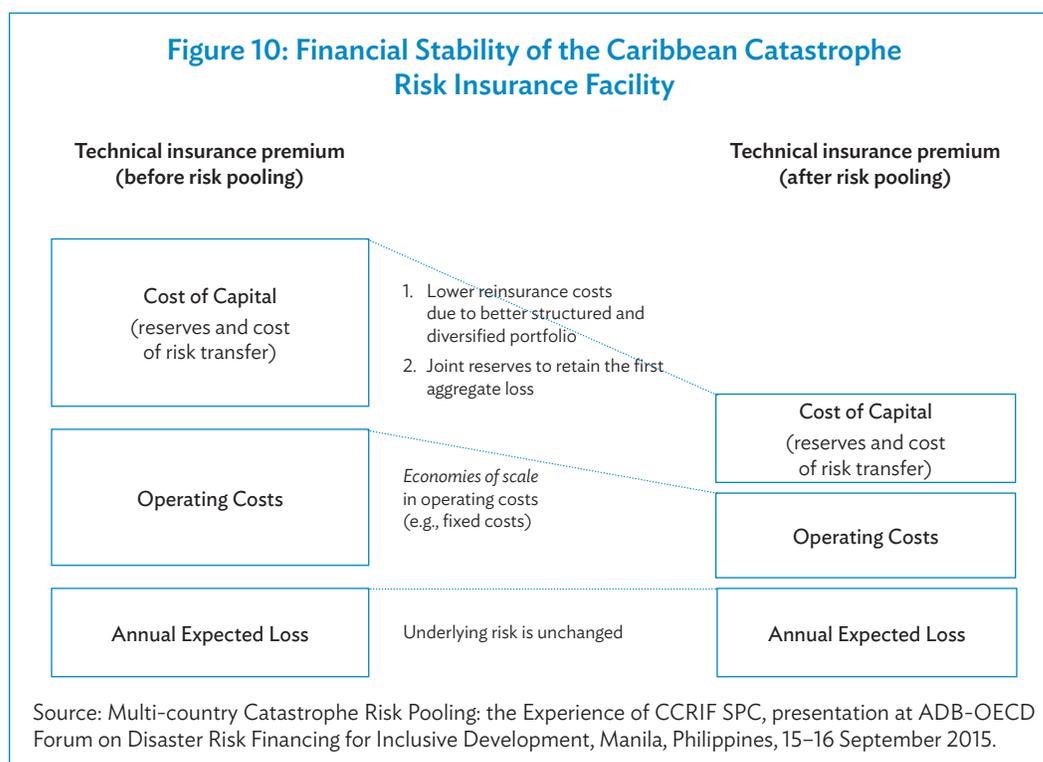
FONDEN = Fund for Natural Disasters.

Source: Risk Management Financial Strategy presentation at ADB-OECD Forum on Disaster Risk Financing for Inclusive Development, Manila, Philippines, 15–16 September 2015.

Lessons from the Caribbean

The Caribbean can expect annual disaster losses equivalent to up to 6% of GDP in some countries.¹² The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is the world's first multi-country risk pool based on parametric insurance. It has provided parametric catastrophe insurance for Caribbean governments since 2007, offering hurricane, earthquake—and since 2013—excess rainfall coverage. In 2014, the facility was restructured into a segregated portfolio company (SPC) to offer new products (for example, excess rainfall) and to expand geographically (into Central America). The CCRIF was developed under technical leadership of the World Bank and with a grant from the Government of Japan. It was initially capitalized through contributions to a multi-donor Trust Fund—from the European Union; World Bank; Caribbean Development Bank; and the governments of Canada, the United Kingdom, France, Ireland, and Bermuda—with membership fees paid by participating governments.

The facility provides financial liquidity quickly when a country's policy is triggered—providing payouts within 14 days (as fast as 1 week). Since 2007, CCRIF has made 15 payouts totaling \$38.8 million to 10 member governments. CCRIF recently expanded to include Central America through a partnership with the Council of Ministers of Finance of Central America, Panama and the Dominican Republic (COSEFIN), Nicaragua joined as the first Central American member in April 2015. Estimates show insurance through CCRIF can halve the premium costs a member country could incur if it obtained coverage on its own (Figure 10). The CCRIF combines benefits



¹² Adapted from “Multi-country catastrophe risk pooling: The experience of Caribbean Catastrophe Risk Insurance Facility”, Isaac Anthony, Caribbean Catastrophe Risk Insurance Facility.

of the pooled reserves with the financial capacity of international financial markets. It retains some of the risk transferred by participating countries and transfers the remainder to reinsurance markets.

CCRIF combines the benefits of pooled reserves from participating countries with the financial capacity of the international financial markets. It retains some of the risk transferred by the participating countries and transfers the remainder of the risk to reinsurance markets. In 2014 a \$30 million catastrophe bond helped the CCRIF transfer the natural disaster risk of 16 member countries to the capital markets at highly competitive prices. The bond provides three years of annual aggregate protection for hurricane and earthquakes.

Policies are triggered based on the occurrence of a pre-defined level of hazard and impact on the basis of events exceeding a pre-established measure of loss. These are estimated based on wind speed and storm surge (tropical cyclones), ground shaking (earthquakes), or rainfall amounts (excess rainfall). Payouts increase with the level of the modelled loss up to a pre-defined coverage limit.

Climate Change and Disaster Risk Financing: The View from Insurance Experts

The Asia-Pacific region is most vulnerable to climate change. Of the 10 countries most affected from 1995–2014 (annual averages), six are in Asia—Myanmar, the Philippines, Bangladesh, Viet Nam, Pakistan, and Thailand.¹³ The key drivers of disaster risk are weather and climate. And the world pays a high price in terms of lost lives. Economic losses continue to be a major development challenge for many developing countries battling climate change and poverty.

Law makers and policy makers are looking to the insurance and reinsurance industry for solutions to mitigate and help finance catastrophe risk. This reliance on the insurance industry is not misplaced. In the past, it has addressed potential effects of climate cycles on natural catastrophes by designing innovative risk transfer solutions.

However, given the magnitude of these risks, the increasing losses from disasters due to increased assets and populations in vulnerable areas, as well as increased interdependencies in the global economy, economic disruptions can have systemic consequences well beyond its locus of impact. With the effect of climate change becoming more and more apparent, these risks are likely to become systemically more important in the future.

Against this backdrop, insurance regulators need to lead in developing principles and taking actions to help the insurance industry identify and quantify risks from large-scale catastrophes—and design mitigation and residual risk financing. Otherwise, unanticipated regulatory or legislative fiats can have unintended consequences on the insurance and reinsurance industry. The two roundtables on “Climate change and insurance supervision” and “Disaster Risk Financing and role of an enabling environment” is part of a larger, ongoing international debate on these issues.

¹³ This section is collated from the proceedings of the Asian Forum of Insurance Regulators (AFIR) Roundtable, 22 April 2016, held in Taipei, China. The exposition is done in question and answer format.

Roundtable 1. Climate Change and Insurance Supervision

Arup Chatterjee, Asian Development Bank: Climate change is an immediate concern for Asia. In November 2015, Standard & Poor's warned that hazards stemming from climate change "can harm sovereign ratings", noting in particular that the Caribbean and Southeast Asian countries are vulnerable.

The growing population in Asia and the Pacific has created additional risks due to scarcity of resources, such as water, energy, and urban infrastructure. Asia's fastest-growing cities are increasingly at risk from climate-related natural hazards including sea level rise. The crop yield in many countries of Asia has declined partly due to rising temperatures. Climate change has significant implications on energy, food and water security. According to ADB, the risks of inaction on climate change in East Asia are grave. Preparedness, including insurance coverage, can reduce the economic and rating impact.

Climate change risks affect the financial soundness of the insurance sector in Asia. Regulators need to both address these uncertainties while taking suitable measures to reduce the protection-gap.

Mamiko Yokoi-Arai, Principal Administrator, Organisation for Economic Co-operation and Development (OECD), Paris, France: *How should governments manage climate risk through policy making? What role should the financial sector play?*

Financial institutions' balance sheets affect development of climate change policies. If the frequency and severity of disasters worsens as a result of climate change, non-life insurance companies will need to manage their portfolios considering this heightened risk. The response by some insurance companies has been to raise premiums. But it may impact the affordability of insurance relevant to disasters in the medium or long term, so policy makers should ensure reasonable premiums levels.

As institutional investors, insurance companies' assets can influence the behavior of other companies. Several are divesting their fossil fuel related investments. Some institutional investors are investing more in companies developing alternative energy, and this is where financial sector policy can help. However, this should be managed to avoid market volatility.

How should OECD experience impact the institutions and regulations covering climate risks in a given country?

The extent of climate change impact is uncertain, but there is much scope to mitigate and adapt. The OECD is doing international stock taking of business and governmental initiatives that address environment, social and governance (ESG) risks in institutional investor decision-making, with a focus on pension funds. We are conducting a review of regulatory frameworks that apply to institutional investment under various jurisdictions and how they are interpreted by institutional investors in terms of their ability or responsibility to integrate ESG factors in their governance processes. The goal is to identify good practices within policymaking and business communities related to ESG investment risks and opportunities and describe how these practices are evolving. It aims to improve our understanding of the extent to which policy and business frameworks support the systematic inclusion of ESG factors in the governance of institutional

investments; how institutional investors interpret their obligations to beneficiaries in terms of ESG analysis; how ESG analysis is implemented in investment decisions; and whether institutional investors have access to the necessary analytical tools. It will also address the issue of disclosure by institutional investors of their investment decision process and the relevant criteria for such disclosure toward different audiences.

It should also provide guidance on what actions might be required from those institutions where investments are made, for example in terms of ESG corporate disclosure; whether or not there is a need to streamline and co-ordinate national efforts; and how ongoing work on benchmarking and disclosure approaches related to carbon risk can complement efforts to reinforce governance approaches.

Yoshihiro Kawai, Secretary General, International Association of Insurance Supervisors (IAIS), Basel, Switzerland: *Regulators around the globe are researching potential risks to financial stability from a failure to contain climate change. How is the IAIS responding to this challenge for ensuring financial stability and the safety and soundness of insurers and reinsurers?*

Insurers are key to underwriting climate change risks as are institutional market investors. Among financial standard setting bodies—based on a G20 request—the FSB established the Task Force on Climate-related Financial Disclosures in December 2015 to recommend how to improve principles for voluntary disclosure by the end of 2016.

In Asia, insurers face significant climate-related events, such as the 2013 floods in Thailand. We know some authorities—for example in Europe and North America—established disclosure requirements on climate-related risks for non-financial firms and/or financial firms. However, one challenge for insurers are that diverse practices and the information disclosed are not comparable. So it is hard for insurers to make assessments against benchmarks and decide on investments or underwriting. The task force will address these issues.

The FSB task force will also address better disclosure by listed companies. As this goes beyond insurers, the IAIS is closely monitoring task force work and remains open to discuss any recent developments in member jurisdictions.

How is IAIS factoring climate change in its principles and standards? How can it help enable regulatory environments consistent with Insurance Core Principles (ICPs) and standards bridge the insurance protection gap in Asia?

Insurance Core Principles provide a good basis. For example, an insurer's risks management framework needs to cover all material risks (ICP 16). In addition, insurer disclosures need to include all material insurance risk exposures (standard 20.7). Where climate-related risk is material to sound risk management and insurer solvency, climate-related risk needs to be appropriately addressed by insurers as well as insurance supervisors.

Also, the IAIS is working with the A2ii to generate and share knowledge and experience for a more inclusive insurance market. Weather index insurance, for example, is one of the key topics. With implementation partners such as the A2ii, IAIS seeks further discussions and communications among supervisors.

Peter Kohlhagen, General Manager, Australian Prudential Regulation Authority (APRA), Sydney, Australia: *Does APRA consider climate change a risk to financial system stability? Do existing safeguards address these specific, unique risks?*

APRA agrees there are risks to financial stability from climate change—it poses physical risks to assets, liability risks to insurers and transition risks if there is a sharp re-pricing of carbon-related assets. Non-life insurers are most directly affected by climate change risk. However, while the risk of increased insurance liabilities is a concern, it is somewhat mitigated by the short-term nature of insurance contracts, which allows insurers to re-price and re-underwrite quickly if risks rise substantially. Of course, if insurance becomes unaffordable or even unavailable in vulnerable areas due to climate changes, falls in asset prices in those areas could impact financial system stability.

- Further, banks may also face significant balance sheet risk from climate change as they tend to have longer-dated exposures that they cannot re-price quickly. For Australian banks one risk may be high exposure to coastal properties—25% of Australia’s population is within 3 kilometers of the coastline.
- In terms of financial safeguards, APRA’s approach is focused on ensuring institutions take the responsibility for understanding and addressing the climate change risks. As supervisors, we need to be satisfied that the Boards and senior management of these institutions are thinking about the issue and identifying and managing the related risks. And we have seen evidence of insurers actively accounting for extreme climate risks—and even being strong advocates for mitigation and action.

Although not specifically related to climate change, strong capital requirements imposed by prudential regulators—particularly for non-life insurance catastrophe risk—add institutional resilience when they confront climate-change-related events. Appropriate reinsurance can also add resilience.

Several dominant sectors of the Australian economy—banking, resources and property for example—are exposed to climate change. Superannuation investments, mortgage debt, sovereign risk and other Australian capital market elements are affected. Which insurance regulations deal with climate change?

For superannuation (and investment) funds more generally, a key risk is repricing assets. This is especially true for uneconomic “stranded” assets due to changes in technology, policy, or demand. This type of repricing may play out over time, and hence institutional investors such as superannuation funds would be able to adjust investments as the repricing occurs.

However, a disorderly transition could happen where asset values adjust very quickly. In Australia, an example could be repricing of thermal and coal powered generators—perhaps as a response to policies on greenhouse gas emissions—and increasing yields on renewable sources from improved technology. Corporate boards and senior management should actively consider these as part of investment strategy decisions.

Again, the intersection of insurance and prudential regulation more broadly is based on ensuring the Boards and management of those institutions exposed to the risk—whether insurers, superannuation funds or bank—are accounting for these risks in decision-making and business models.

Also, APRA has been looking at catastrophe modelling governance and risk management policies and practices for non-life insurers. In 2012, APRA introduced new, more risk sensitive capital requirements for insurers. A key aspect was strengthening capital held against catastrophe risks. In 2013, APRA reviewed catastrophe modelling and related governance of several insurance industry participants. It outlined key matters for Boards and senior management to consider on catastrophe risk governance and management. Importantly, this helped encourage insurers to clearly articulate their appetite for catastrophe risk and understand models' strengths and weaknesses, among other things. This is clearly relevant for managing climate change risks, particularly as they relate to increased frequency or severity of natural hazards.

APRA's view is that the main responsibility for managing risk to a financial institution from climate change (as with all risks) sits firmly with the institution. It does not seek to prescribe how an institution—whether an insurer, bank or superannuation fund—should be doing this. Through its supervision, APRA asks questions of the Board and management to probe whether they understand the risks. It wants to know there is dialogue happening on the issue internally, that it is considered in their business models and they understand the implications.

Sultan ul Abedine Molla, Member, Insurance Development and Regulatory Authority, Dhaka, Bangladesh: *How can financial inclusion help as a climate change strategy for Bangladesh's low-income population?*

Bangladesh is one of the most climate vulnerable countries in the world. Situated at the deltaic range of the Ganges, Brahmaputra and Meghna rivers—and watered by 54 rivers flowing from neighboring India, it is mainly alluvial. Water diverted in the upper stream of trans-boundary rivers—particularly from the Farakka dam in the mid-70s—changed the ecosystem of about one-third area of the country. Numerous rivers and canals have dried-up over the last few decades. This, coupled with environmental degradation, caused natural disasters like cyclones, tidal bores, tornadoes, and floods, among others, with huge loss of lives and property, mainly of the rural poor.

Policy makers have taken various steps—including financial inclusion—to mitigate these losses. Government has subsidized agricultural inputs, such as diesel and electricity for irrigation, seeds, fertilizer, and insecticides. Agricultural credit from nationalized banks and financial institutions is available for almost all crops at lower interest rates. This also applies to poultry, livestock, pisciculture, horticulture and other similar sectors. Government has been constructing coastal embankments and using forestation to protect land and property from tidal bore and cyclone losses. It also distributes free saplings for tree plantation throughout the country. Various social safety net programs should also mitigate the sufferings of the poor. These include feeding programs for the poorest, monthly allowances for the elderly, food for work programs during lean periods, housing projects for the rural poor, among others. The government also facilitates such programs through local and foreign NGOs and PVOs.

Bangladesh established the \$200 million Bangladesh Climate Change Trust Fund (BCCTF) and the \$114 million Bangladesh Climate Change Resilience Fund (BCCRF). And the high priority Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 identified six thematic areas:

- (i) Food security, social protection and health;
- (ii) Comprehensive disaster management;

- (iii) Infrastructure;
- (iv) Research and knowledge management;
- (v) Mitigation and low-carbon development, and
- (vi) Capacity building and institutional strengthening.

What developmental role is IDRA playing for increasing insurance penetration as a way to reduce risk?

IDRA was established in 2011 under the 2010 Insurance Development and Regulatory Authority Act, which greatly expanded the insurance mandate without providing adequate staffing—most staff from the previous Directorate moved to other public offices. Government approval for recruiting new IDRA staff was received only recently. Upon IDRA's recommendation, the Ministry of Finance issued *Insurance Policy – 2014* covering short-, mid- and long-term programs for the development of the Bangladesh insurance industry by 2021—some 50 issues must be addressed. Given the lack of manpower, IDRA is training insurance agents and mid-level executives at the division level. Public awareness is another theme. An IDRA organized 3-day Insurance fair recently brought 28 life and 21 non-life insurers in touch with large crowds. Pilot projects are also studying the feasibility of:

- (i) Weather Based Index Insurance (Excess Rainfall/Temperature);
- (ii) Weather Index-Based Crop Insurance (ADB funded);
- (iii) Flood Insurance;
- (iv) Comprehensive Insurance Scheme for Women;
- (v) Paddy Insurance; and
- (vi) Micro-Health Insurance

The goal is to bring insurance coverage to poor and marginal farmers. To increase insurance penetration, IDRA is also directing life insurers to expand micro-insurance and group insurance—both rural and urban—to cover the low-income groups. Already, most mechanized vehicles run by the poor are subject to insurance coverage. And SME insurance coverage is mandatory.

Fatta Bahadur K.C, Chairman, Beema Samiti, Nepal: *What steps have been taken in recent months to make sure that responses to climate change are risk-informed and that Nepal is better prepared for disaster risk financing?*

Current climate change trends greatly affect the people, resources and economy of all countries, including Nepal. It is not just an environmental issue, but more importantly a development and human issue. Nepal is one of the most vulnerable countries, with water-induced-disasters and hydro-metrological extreme events such as droughts, storms, floods, landslides, and soil erosion, among others. Based on the National Adaption Program of Action 2010, out of 75 districts, 29 are highly vulnerable to landslides, 22 to drought, 12 to Glacier Lake Outburst Floods (GLOF) and 9 to flooding. Nepal is also ranked the 11th most earthquake-prone country in the world.¹⁴

High rates of snow and glacier melting, frequent floods and droughts, change in the composition of climate-induced vegetation and increased disease are the main effects Nepal faces from climate change. Earthquake and climate-induced disasters have accelerated vulnerabilities and risks to water, sanitation and food security.

¹⁴ http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Nepal/1/Nepal_INDC_08Feb_2016.pdf

Nonetheless, concerned efforts are inadequately implemented to protect people, their livelihoods and eco-systems. With the increasing damage of climate change and the 2015 earthquake, Nepal is urgently requires huge investments in adapting and building resilience to climate.

Nepal has initiated several activities to reduce climate hazards and build resilience and help climate vulnerable communities cope with climate change impacts. The government has created the contingency funding scheme in the form of Prime Minister Relief Fund: money is injected in this fund as a set-aside by government and received by way of donations from inside and outside the country after a disaster. After the last earthquake, the amount collected was about NRs5 billion and NRs100 billion. However, this was unable to cope with the severity of the disaster. The government does not have sufficient financial reserves to absorb losses, recover and rebuild following a disaster.

So Nepal needs to invest significantly in disaster planning and evacuation procedures. And it is taking several steps:

1. Recently, the government established the National Reconstruction Authority to rebuild infrastructure and settlements devastated by the April 2015 earthquake and make Nepal greener and more resilient to natural hazards.
2. The government has also formed a 'Reconstruction Fund' totaling NRs 100 billion.
3. And it has created New Building Codes for Reconstruction which is expected to assist making new buildings and reconstruction resilient to major earthquakes. Beema Samiti of the Insurance Regulatory Authority of Nepal has requested the government to make insurance mandatory for new as well as reconstructed buildings.

Roundtable 2: Disaster Risk Financing and Role of an Enabling Environment

Arup Chatterjee, Asian Development Bank: Confronted with the fiscal challenges disasters present, policy makers are seeking to strengthen financial management to ensure that populations, businesses, and governments have adequate resources to facilitate timely post-disaster response and to build back better, strengthening resilience to future hazard events. Ex ante DRF instruments include disaster reserve funds; lines of contingent credit; and various risk transfer products, involving insurance, reinsurance and capital market solutions. Ex post DRF instruments include recurrent and capital budget reallocations, post-disaster borrowing, tax increases, and donor assistance (footnote 4).

What role can ex-ante (pre-loss) financing instruments play—including insurance, reinsurance and capital markets risk transfer tools—to meet immediate liquidity needs for emergency response, recovery and reconstruction post- catastrophe?

Indrani Sugathadasa, Chairperson, Insurance Board of Sri Lanka, Colombo, Sri Lanka: *How has Sri Lanka's Development Policy Loan with a Catastrophe Deferred Drawdown Option (CATDDO) helped improve institutional mechanisms for DRM, increase climate-resilient development, and understanding of disaster risk?*

The World Bank's 2014 \$102 million Development Policy loan with a Catastrophe Deferred Draw Down Option (CATDDO) can be drawn if the country declares a state of emergency after a disaster. The loan has not been used, despite a severe 2015 landslide in Uva province.

But the loan was approved along with a \$110 million Climate Resilience Improvement Project (CRIP), a 5 year project to finance both short- and long-term interventions to reduce climate and disaster risk.

CRIP is run by the Ministry of Irrigation and Water Resources Management through relevant agencies. The Ministry of Disaster Management is on the steering committee.

During the past 20 months, as short-term interventions, the project has worked to repair damage caused by flooding across roads, schools and other public infrastructure. It has also developed and strengthened schools and roads.

But it is also working long-term to mitigate climate and disaster risk. For example, seven main rivers have been identified as causes for damage during heavy rains, and plans are being drawn up to divert these rivers to mitigate floods. River basin surveys and modeling are under way.

Training on accurate forecasting for engineers and other technical staff is part of the project, while 122 hydrometric stations now obtain satellite data.

To improve understanding of disaster risk, public awareness is crucial. With weather patterns more unpredictable, farmers and inhabitants of river basins need to be constantly educated.

As Sri Lanka moves toward a risk-based capital (RBC) regime, does required capital reflect reserve risk on claims both current and future incurred? Does IBSL require insurers to construct appropriate catastrophe scenarios?

Starting 1 January 2016, Sri Lankan insurance companies must demonstrate solvency under the RBC regime. Before this, the Insurance Board of Sri Lanka extensively studied its suitability. Initially, when considering which risks to fall under the RBC regime, a Catastrophic Risk Capital Charge was proposed. However, based on World Bank analysis and discussions with IBSL, it was decided not to have an explicit charge for Catastrophic Risk at the initial stage of the RBC Rule, but to revisit it later. There were several reasons for this.

The largest catastrophe faced by the Sri Lankan insurance industry was the 2004 tsunami, which killed an estimated 35,000–40,000 people and destroyed some 93,000 homes. Yet the effect on the insurance industry was minimal due to low insurance penetration. In 2004, total premiums as a percent of GDP was around 1.52%, with general insurance premiums at 0.88%. These penetration levels have not improved much. This appears to be the biggest problem.

The IBSL intends to review catastrophe reinsurance protection across the industry to assess exposure to catastrophic risk and how insurers plan to mitigate risk as part of their ERM process.

The catastrophe excess of loss reinsurance protection for fire insurance is generally low; however they purchase large amounts of proportional reinsurance cover and facultative protection to limit the amount of exposure to catastrophe excess of loss covers.

Warren Chang, President, Taipei, China's residential earthquake insurance fund: *Taipei, China introduced the residential earthquake insurance program 2002, a pool diversifying earthquake risk through a combination of local co-insurance, a nonprofit fund, reinsurance and government budget.*

Are there regulatory preconditions? How does one measure exposure and assess the capacity and solvency of the pool?

Regulatory preconditions for joining (based on Article 138-1 of the Insurance Act) include non-life insurers underwriting residential earthquake risk and the Insurance Bureau (or competent authority) to establish a risk-spreading mechanism, which is managed by Taipei, China's residential earthquake insurance fund.

The government provides rules and regulations governing risk assumptions, amounts insured, premiums, and a provision for reserves, among others. It is responsible for the incorporation, business scope, and budget allocation of Taipei, China's residential earthquake insurance fund. The government assumes a portion of the overall assumption limit and provides guarantees in case a major earthquake causes a fund shortage. Taipei, China's residential earthquake insurance fund may request the government to apply for collateral by the national treasury to source funding. Banks are the major distribution channel to expand the base for residential earthquake and fire insurance.

For each disaster event, the probable maximum loss (PML) is assessed by catastrophe (CAT) modelling with a return period for scheme limit targeted at 400 years. It assesses the aggregate sum insured, geological factors, and constructions portfolio.

Before 2010, vendor CAT models were applied, such as Risk Management Solutions (RMS) and EQECAT. Afterwards, an "earthquake risk" model was developed, designed to enhance the rationality and reliability of risk assessment, enhance research on actuary, amounts insured, claims criteria and risk spreading mechanisms, while constantly reviewing and updating geographical data and parameters.

It also established solvency regulations via its "Enforcement Rules for the Risk Spreading Mechanism of Residential Earthquake Insurance". This provides directions for setting aside reserves, among others. Co-insurance members set aside or treat the unearned premium reserve, loss reserve and special reserve for its shares retroceded. And it offers government guarantees for loans in case of fund shortages.

Is Taipei, China's residential earthquake insurance fund—which issued a catastrophe bond in 2003—looking at catastrophe bonds as a possible solution for its disaster risk financing needs? What regulatory preconditions are needed for enabling cat bond issuance?

The first catastrophe bond was issued for several reasons. First is timing. After the 9/11 terrorist attack in the United States, the reinsurance market saw prices rise with limited capacity. Catastrophe bonds were seen as a way to lock in both pricing and capacity to reduce exposure to reinsurance market volatility,

Second, catastrophe bonds were seen as an important alternative risk transfer tool. And the development of a catastrophe bond market was expected to be prosperous and function smoothly. So the 2003 bond was issued as a pilot project to gain experience and enhance future capabilities.

Today, due to the softness of reinsurance market conditions, the price of catastrophe bonds and its issuance cost remains comparatively higher than the price of traditional reinsurance. Whether

to re-issue catastrophe bonds or not needs to consider the timing and costs of issuance, as well as the willingness of investors to take part.

Also, four regulatory preconditions need to be put in place for enabling the issuance of catastrophe bonds.

1. The legal basis for offering catastrophe bond issuance is need. For example, the US applies “Rule 144A” under the United States Securities Act of 1933.
2. Regulations for establishing a Special Purpose Reinsurer Vehicle (SPRV) are needed. Some SPRVs can be easily set up in Bermuda or Cayman Islands, where local setup regulations are applied.
3. Authorities need to allow reinsurance cession by sponsors (such as Taipei, China’s residential earthquake insurance fund) to the SPRV, which is not a rated reinsurer.
4. Catastrophe bonds are sold only to “qualified institutional buyers” or individual investors defined and approved under certain rules and regulations.

T.S Vijayan, Chairman, Insurance Regulatory and Development Authority of India, Hyderabad, India: *India has been discussing a catastrophe insurance pool for quite some time, with reinsurers uncomfortable taking exposure. What keeps a National Catastrophe Pool stuck? What role can multilateral development banks play in closing the protection gap?*

In India, disaster management is primarily handled by State governments with the Central government playing a supportive role. Under The Disaster Management Act, 2005, the roles and responsibilities of National, State, District and the Local authorities were delineated. They aim to provide immediate relief for those affected and for urgent infrastructure repairs (rather than for long term reconstruction). This emergency relief does not deal with compensation commensurate to the economic loss incurred.

Thus, risk transfer through insurance is practical. To overcome low insurance penetration, recommendations include local governments requiring mandatory private home insurance, particularly in vulnerable regions, along with critical public infrastructure, revenue generating utilities, and places of public gatherings. But it is up to governments to ensure they are implemented. For catastrophe pools from India’s insurance industry to emphasize essential coverage rather than profit making, governments must offer incentives such as premium subsidies and/or taxation.

Since the insurance sector opened for private participation in 2000, India witnessed formation of a Terrorism Pool, Motor Third Party Pool, Motor Third Party (Declined Risk) Pool and Nuclear Pool. In all these arrangements, necessary participation of all registered (re)insurers was assured commensurate with their respective business activity. So far all these insurance pools served their intended purposes, although two Motor Third Party Pools were dismantled, as markets were able to price their products efficiently.

India has also seen natural catastrophic events in recent years. Property insurance rates—particularly Storm, Tempest, Flood and Inundation (STFI) rates—increased in the insurance market. Nonetheless, insurance/reinsurance coverage remains available. Still, India’s regulator is closely observing the effects of climate change with “once-a-century” events becoming more frequent, increasing the financial vulnerability of insurers. As primary legislation governing India’s

insurance industry continues to liberalize, six of the world's largest reinsurers (including Lloyds of London) are expected to establish branch offices soon. Regulators believe that forming catastrophe insurance pools with active participation from all insurers and reinsurers operating in India would provide the necessary stability to insurance coverage for catastrophic events. Regulators want to help pools form to expand affordable insurance coverage. Multi-lateral development banks need to support and actively engage with governments in creating ex-ante DRM solutions such as mandatory insurance coverage and offering incentives to the insurance industry.

Role of ADB

In 1987, ADB became the first regional multilateral development bank to adopt a disaster and emergency assistance policy, focused largely on disaster recovery in the Pacific.¹⁵ Post-disaster support spread to all ADB developing member countries through a broader 1989 policy that also began to incorporate elements of disaster risk reduction. The Disaster and Emergency Assistance Policy (DEAP) (2004), still in force, took risk reduction into account and signaled ADB's shift to a more proactive disaster response. ADB established the Asia Pacific Disaster Response Fund (APDRF) in 2009 as a special fund designed to provide incremental grant resources (up to \$3 million) to developing member countries struck by a major disaster triggered by a natural hazard. Since 2013, ADB's Asian Development Fund (ADF) Disaster Response Facility has fast-tracked emergency assistance loans.

ADB's *Strategy 2020*, approved in 2008, also addresses disasters. It notes that ADB will continue mainstreaming DRM to provide early and medium-term disaster support in partnership with specialized aid agencies.

The *Operational Plan for Integrated Disaster Risk Management, 2014–2020* seeks to strengthen disaster resilience in ADB's DMCs. The operational plan outlines ADB's integrated disaster risk management approach (Figure 11) while recognizing the importance of reducing disaster risk in both the immediate and long term, taking the possible effects of climate change into account. It also highlights the urgent need to enhance the management of residual disaster risk, including through the establishment of adequate disaster risk financing arrangements. It outlines a series of crosscutting actions to address these needs, focusing on institutionalizing integrated disaster risk management, strengthening capacity and knowledge, investing in disaster resilience, and engaging stakeholders.

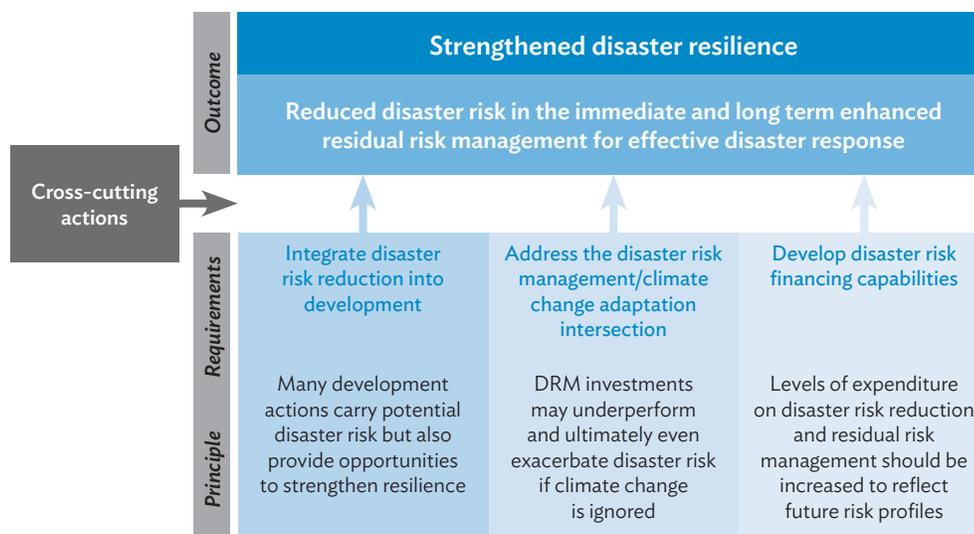
ADB has seen a gradual increase in investment in DRR support to its developing member countries, with a growing number of projects including risk reduction components. For instance, from the 2001 Gujarat earthquake, the 2004 Indian Ocean tsunami, the earthquakes in Pakistan, the People's Republic of China and most recently in Nepal; the floods in Pakistan, Cambodia and more recently in Myanmar, ADB also partners with developing members to provide support in the wake of disasters.¹⁶ For example, ADB emergency assistance, grants and loans in response to the 2013 Typhoon Haiyan (Yolanda) in the Philippines totaled \$900 million.

Between August 1987 and December 2015, ADB approved \$31.02 billion for a total of 837 DRM and DRM-related projects (Figure 12). Of this, 22.9% (\$7.11 billion) was for relief, early

¹⁵ Adapted from ADB presentations/discussions by Noritaka Akamatsu (Senior Advisor, SDOD), Bruno Carrasco (Director SAPF), Kelly Bird (Director, SEPF), Charlotte Benson (Principal Disaster Risk Management Specialist, SDOD), Arup Chatterjee (Principal Financial Sector Specialist, SDAS) and Mayumi Ozaki (Senior Portfolio Management Specialist, SAPF) at the ADB-OECD Forum on Disaster Risk Financing, held 15–16 September 2015.

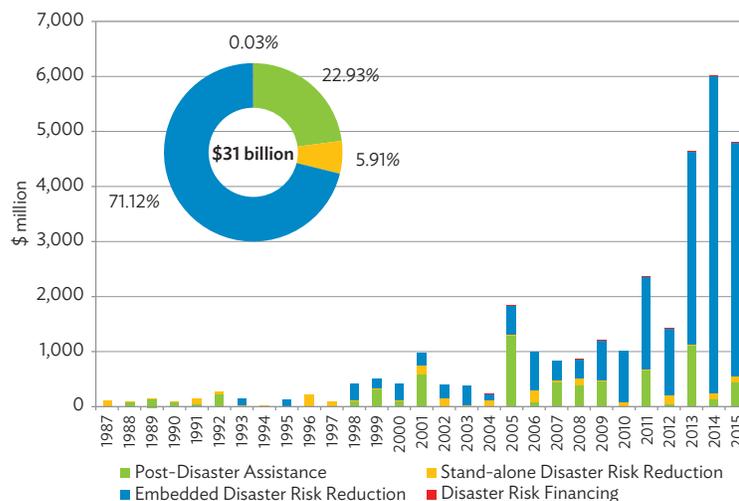
¹⁶ <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/4281.pdf>

Figure 11: ADB’s Integrated Disaster Risk Management Approach



Source: ADB.

Figure 12: ADB Disaster Risk Management Operations, 1987–2014



Source: ADB.

recovery and reconstruction. The general principles that guide ADB’s support to governments post-disaster include “building back better”, strengthening the resilience of reconstructed infrastructure against future events.

Another important principle is inclusiveness, to ensure that the needs of the poor and other vulnerable social groups are considered. Critically, this involves expanding capacity and good

governance. ADB works closely with governments to help build strong institutional capacity and ensure sound governance and fiduciary risk management systems for recovery and reconstruction.

The lessons learned from this growing experience must now be incorporated into future projects, project components and technical assistance.

In the future, ADB plans to systematically include disaster risk reduction in its country partnership strategies and design. Creating awareness and demand through policy dialogue and technical advisory services must be an element in these strategies. In DRF, sovereign, household and business require balance depending on country circumstances. In that sense, all DRF elements discussed—including risk retention; contingent credit; risk transfer; and international assistance require structuring to country (and subregional) needs, capacity, institutional depth, and timeliness.

Support for the development of comprehensive DRF strategies and individual products through support of pilot projects, establishing risk pools and innovative risk transfer vehicles needs to be done. Post-disaster aid covers 4% of total losses on average in an ADB developing member country, while low penetration of market-based risk transfer instruments reflect structural deficits in both demand (affordability, institutional and market trust, and financial literacy, for example) and supply (an appropriate legal framework, sufficient, accurate data, and naturally, sufficient funding).

APPENDIX 1A

National Platforms and Focal Point Agencies in Selected Asian Countries

	National Platform (Chair)	Focal Point Agency	Related act	Model, Mandate ^a
Southeast Asia				
Brunei Darussalam	–	National Disaster Management Centre, Ministry of Home Affairs	–	(i)
Cambodia	National Committee For Disaster Management (Prime Minister)	National Committee Disaster Management General Secretariat	Sub-decree No. 35 ANK	(i)
Indonesia	–	National Disaster Management Agency	Disaster Management Law	(i)
Lao People's Democratic Republic	National Disaster Management Committee	National Disaster Management Officer, Ministry Labor and Social Welfare		(iii) Relief
Malaysia	Disaster Management and Relief Committee (Deputy Prime Minister)	National Security Division, Prime Minister Department	National Security Council Directive No. 20, 1997	(i)
Myanmar	Central Committee on National Disaster Prevention (Prime Minister)	Relief and Resettlement Department Ministry of Social Welfare	Rehabilitation Board Act. 1950, Disaster Management Law (draft)	(iii) Relief
Philippines	National Disaster Coordination Council (Defense Minister)	Office of Civil Defense, Department of National Defense	Disaster Risk Reduction, Man. and Recovery Act	(i)
Singapore	–	Civil Defense Force, Ministry of Home Affairs	Civil Defense Act 1986	(iii) Search and Rescue, Fire
Thailand	National Disaster Prevention and Mitigation Committee (Prime Minister or Deputy Prime Minister)	Department of Disaster Prevention and Mitigation, Ministry of Interior	Disaster Prevention and Mitigation Act 2007	(iii) Search and Rescue, Fire
Viet Nam	Central Committee for Flood and Storm Control (Prime Minister)	Disaster Management Center, Department Dike Management and Flood and Storm Control, Ministry Agriculture Rural Development	Decree No. 168, 1990	(iii) Flood Management

continued on next page

Table continued

	National Platform (Chair)	Focal Point Agency	Related act	Model, Mandate ^a
South Asia				
Bangladesh	National Disaster Management Council (Prime Minister)	Disaster Management Bureau, and Directorate of Relief and Rehabilitation, Ministry of Food and Disaster Management	Disaster Management Act, 2008	(iii) Relief
Bhutan	National Committee for Disaster Management (Cabinet Minister)	Disaster Management Division, Ministry of Home and Cultural Affairs	National Disaster Management Act	(i)
India	National Disaster Management Authority (Prime Minister)	National Institute of Disaster Management, Ministry Home Affairs Disaster Management Center, Ministry of Defense	Disaster Management Act 2006	(i)
Maldives	–	Disaster Management Center, Ministry of Defense	(Draft)	(i)
Nepal	Central National Disaster Relief Committee (Home Minister)	Disaster Management Section and National Emergency Operations Center, Ministry of Home Affairs	Disaster Relief Act 1982	(iii) Relief
Pakistan	National Disaster Management Commission (Prime Minister)	National Disaster Management Authority	National Disaster Management Ordinance 2006	(i)
Sri Lanka	National Council for Disaster Management (President and Prime Minister)	Disaster Management Centre, Ministry of Disaster Management	Disaster Management Act 2005	(ii)
East Asia				
People's Republic of China	National Commission for Disaster Reduction (Vice President of State Council)	National Disaster Reduction Center, Ministry of Civil Affairs	More than 30 laws and regulations	(iii) Relief
Japan	Central Disaster Management Council (Prime Minister)	Disaster Management Office, Cabinet Office	Disaster Countermeasures Basic Act	(i)
Mongolia	State Emergency Commission (Deputy Prime Minister)	National Emergency Management Agency	Law on Disaster Protection 2003	(iii) Search and Rescue, Fire
Republic of Korea	Central Safety Management Council (Prime Minister)	National Emergency Management Agency, Ministry of Public Administration and Safety		

^a (i) coordinating agency without implementation; (ii) in parallel with other government ministries; (iii) from implementation organizations.

Source: Adapted from ADBI.2015. *Disaster Risk Management in Asia and the Pacific*.

APPENDIX 1B

Examples of Local Disaster Risk Reduction Models in Asia

No.	Model	Locality/Country	Key Points
1	Locally institutionalized; linked to national system	Philippines	<ul style="list-style-type: none"> Local disaster risk reduction and management fund; complies with Disaster Management Law Builds sustainability and local capacity
2	Bottom-up structure; reliance on indigenous skills	Gujarat, India	<ul style="list-style-type: none"> Uses post-disaster recovery experience Validates local knowledge for housing reconstruction—masonry training by local government
3	Youth-led disaster risk reduction	Philippines	<ul style="list-style-type: none"> Youth council for risk reduction; budget and annual work plan from city to sub-district (barangay) level Linked to school science clubs
4	Risk awareness	Indonesia	<ul style="list-style-type: none"> Faith-based group (Islam) disseminates knowledge on disaster risk National network of local mosques where village and neighborhood leaders explain grass-root risk reduction
5	School-based	Da Nang, Viet Nam Saijo, Ehime Prefecture, Japan	<ul style="list-style-type: none"> Disaster risk and response exercises in each school; supported by local education board Both pre- and in-service teacher training Part of each school's non-formal education system Teacher groups formed to promote disaster education as part of local risk reduction strategy
6	Welfare-based	Kobe, Japan	<ul style="list-style-type: none"> Community groups linked to neighborhood health and welfare system City employees and volunteers sustain program
7	Governance-based	Aceh, Indonesia	<ul style="list-style-type: none"> Compliance system for post-disaster recovery Ensures quality control of product and process (for infrastructure or housing)

Source: Adapted from ADBI. 2015. *Disaster Risk Management in Asia and the Pacific*.

APPENDIX 2

Conference Agendas

ADB-OECD Forum on Disaster Risk Financing for Inclusive Development

**ADB Headquarters, Manila
15–16 September 2015**

DRAFT AGENDA

15 SEPTEMBER	
1:30 p.m.– 2 p.m.	REGISTRATION
2 p.m.– 2:15 p.m.	<p>WELCOME REMARKS: ADB’s Role as Your Partner for Disaster Risk Financing Bambang Susantono</p> <p><i>Vice-President, Knowledge Management and Sustainable Development Asian Development Bank</i></p>
2:15 p.m.– 2:45 p.m.	<p>SESSION 1: Disaster Risk Financing—To Have or Not to Have?</p> <p style="text-align: center;">Moderator Kelly Bird</p> <p style="text-align: center;"><i>Director, Public Management, Financial Sector, and Trade Division, Southeast Asia Department Asian Development Bank</i></p> <p>ADB’s disaster risk management approach and the role of disaster risk financing</p> <p style="text-align: right;"><i>Charlotte Benson Asian Development Bank</i></p> <p>Exploring the case of disaster risk financing in a country context</p> <p style="text-align: right;"><i>Mayumi Ozaki Asian Development Bank</i></p> <p>ADB’s Support for Insurance and Reinsurance Solutions for Developing Member Countries</p> <p style="text-align: right;"><i>Arup Chatterjee Asian Development Bank</i></p>
2:45 p.m.– 4:15 p.m.	Coffee Break

4:15 p.m.– 5:45 p.m.	<p>SESSION 2: Sovereign Disaster Risk Management in Asia—What Do We Know?</p> <p style="text-align: center;">Moderator Bruno Carrasco</p> <p style="text-align: center;"><i>Chair, Finance Sector Group Committee and Director, Public Management, Financial Sector and Trade Division, South Asia Department Asian Development Bank</i></p> <p>Financial Management of Disaster Risks in Japan</p> <p style="text-align: right;">Noriyuki Mita <i>Ministry of Finance, Japan</i></p> <p>Enhancing financial preparedness for management of disasters in the Philippines</p> <p style="text-align: right;">Maria Estela Laureano <i>Department of Finance, Philippines</i></p> <p>Fiscal disaster risk assessment options for consideration in Pakistan</p> <p style="text-align: right;">Nasreen Rashid <i>Insurance Expert, Pakistan</i></p>
5:45 p.m.– 7:30 p.m.	<p style="text-align: center;">NETWORKING COCKTAILS</p> <p style="text-align: center;"><i>Hosted by the Finance Sector Group</i></p>
16 SEPTEMBER	
9 a.m.– 10:30 a.m.	<p>SESSION 3: The Pros and Cons of Financing Instruments for Disaster Risk</p> <p style="text-align: center;">Moderator Betty Wilkinson</p> <p style="text-align: center;"><i>Director, Public Management, Financial Sector and Trade Division, Central and West Asia Department Asian Development Bank</i></p> <p>Insuring public finances against disasters: The experience of Mexico’s Natural Disaster Fund</p> <p style="text-align: right;">Salvador Perez Maldonado <i>Secretaria de Hacienda y Credito Publico, Mexico</i></p> <p>Multi-country catastrophe risk pooling: The experience of Caribbean Catastrophe Risk Insurance Facility</p> <p style="text-align: right;">Isaac Anthony <i>Caribbean Catastrophe Risk Insurance Facility</i></p> <p>Peru’s approach to financial management of disaster risks</p> <p style="text-align: right;">Gregorio Belaunde <i>Ministerio de Economía y Finanzas, Peru</i></p>

10:30 a.m.– 10:45 a.m.	Coffee Break
10:45 a.m.– 11:45 a.m.	<p>SESSION 4: Working Together to Limit the Financing Impact of Disasters</p> <p style="text-align: center;">Moderator Noritaka Akamatsu <i>Senior Advisor, Sustainable Development and Climate Change Department Asian Development Bank</i></p> <p><i>(Moderated discussion round on currently existing concerns and priorities with regards to disaster risk financing, and exploration of potential areas of interest for ADB's future work program)</i></p> <p style="text-align: right;">Arup Chatterjee <i>Asian Development Bank</i></p> <p style="text-align: right;">Charlotte Benson <i>Asian Development Bank</i></p> <p style="text-align: right;">Salvador Perez Maldonado <i>Secretaria de Hacienda y Credito Publico, Mexico</i></p> <p style="text-align: right;">Noriyuki Mita <i>Ministry of Finance, Japan</i></p> <p style="text-align: right;">Maria Estela Laureano <i>Department of Finance, Philippines</i></p>
11:45 a.m.– 12 noon	<p>VALEDICTORY REMARKS</p> <p>Rintaro Tamaki <i>Deputy Secretary General OECD</i></p>

Global Seminar on Disaster Risk Financing: Towards the Development of Effective Approaches to the Financial Management of Disaster Risks

AGENDA

SEPTEMBER 16 (afternoon)	
Bank Negara Malaysia will organise a half-day city tour of Kuala Lumpur for interested participants in the seminar (from 1:30 p.m.–5:30 p.m.). Please see the Administrative and Logistical Information note for further details.	
SEPTEMBER 17	
8:30 a.m.– 9 a.m.	Registration of participants
9 a.m.– 9:15 a.m.	<p>Opening remarks:</p> <p>Rintaro Tamaki, Deputy Secretary General, Organisation for Economic Co-operation and Development</p>
9:15 a.m.– 10:45 a.m.	<p>SESSION 1: The need to develop disaster risk financing strategies: considerations and international guidance</p> <p><i>Disasters can have significant financial implications for governments, businesses and households through direct damages to infrastructure and property as well as disruptions to economic activities and livelihoods. The development of disaster risk financing strategies can support governments' efforts to manage these significant financial implications. This session will provide an overview of the need for the effective financial management of disaster risks and elements necessary for the development of disaster risk financing strategies.</i></p> <ul style="list-style-type: none"> • <i>Why is it important to develop strategies for the financial management of disaster risks?</i> • <i>What international guidance and support is available to countries seeking to develop such strategies?</i> <p>Moderator: Odd Per Brekk, Director, Regional Office for Asia and the Pacific, International Monetary Fund</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>The case for disaster risk financing</i> Charlotte Benson, Senior Disaster Risk Management (Disaster Risk Financing) Specialist, Climate Change and Disaster Risk Management Division, Asian Development Bank • <i>A framework for the financial management of disaster risks: development of disaster risk financing strategies</i> Leigh Wolfrom, Policy Analyst, Directorate for Financial and Enterprise Affairs, Organisation for Economic Cooperation and Development • <i>World Bank Disaster Risk Financing and Insurance Strategy</i> Olivier Mahul, Disaster Risk Financing and Insurance Program Manager, World Bank • <i>Importance of a holistic approach to financial management of disaster risks: Australia's experience</i> Samantha Ward, Director, Emergency Management Policy Branch, Attorney-General's Department, Australia

10:45 a.m.– 11 a.m.	Coffee Break
11 a.m.– 12:45 p.m.	<p>SESSION 2: Tools for understanding disaster risk</p> <p><i>Understanding and quantifying disaster risks is a critical prerequisite to the effective financial management of those risks. This session will explore the tools and institutional capacities necessary for a comprehensive assessment of natural hazards, exposures and vulnerabilities and share the experiences of countries that have put in place the necessary capacity and tools.</i></p> <ul style="list-style-type: none"> • <i>What are the methods available for assessing disaster risk?</i> • <i>What are the data needs for using sophisticated assessment tools such as catastrophe models?</i> • <i>Do existing approaches take appropriate account of changes to the nature of disaster risks, such as the potential impact of climate change on the intensity and frequency of extreme events?</i> • <i>What else needs to be considered when assessing financial and economic capacity to manage disaster impacts?</i> <p>Moderator: Mr. Marc Gordon, Coordinator (HFA Review), UNISDR—United Nations, Office for Disaster Risk Reduction</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>The role of catastrophe modelling in the assessment of exposure to disaster risks</i> Ashish Jain, AVP and Head of Singapore Operation, AIR Worldwide • <i>Assessing disaster exposure—Peru’s experience</i> Gregorio Belaunde, Director, Risk Management, Ministry of Economy and Finance, Peru • <i>Tools for quantifying risk and indicators of financial resilience</i> Sergio Lacambra Ayuso, Lead Specialist, Natural Disaster and Risk Management, Inter-American Development Bank • <i>Managing the financial risks of climate change—Munich Re’s perspective</i> Ernst Rauch, Head Corporate Climate Centre, Munich Reinsurance Company
12:45 p.m.– 1:45 p.m.	Lunch
1:45 p.m.– 3:45 p.m.	<p>SESSION 3: Recovering from disasters: ensuring the availability of funding</p> <p><i>A key consideration in the development of disaster risk financing strategies is quick access to funding to support the recovery and reconstruction and limit the impact of the disaster event on the economy by minimising disruption. This session will explore the approaches taken in a number of countries from across the world with very different levels of fiscal capacity and disaster risk financing needs.</i></p> <ul style="list-style-type: none"> • <i>What are the relative costs and benefits associated with different DRF instruments?</i> • <i>What is the right balance between ex ante and ex post instruments?</i> • <i>What can the national government do to address funding gaps at the local government level?</i> <p>Moderator: Ms. Charlotte Benson, Senior Disaster Risk Management (Disaster Risk Financing) Specialist, Climate Change and Disaster Risk Management Division, Asian Development Bank</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Funding public sector recovery and reconstruction needs: Mexico’s experience</i> Salvador Perez Maldonado, Deputy Director General, Risk Management, Secretaría de Hacienda y Crédito Público, Mexico

	<ul style="list-style-type: none"> • <i>Developing a disaster risk financing strategy: Philippines' experience</i> Stella Laureano, Director III, International Finance Operations, Department of Finance, Philippines • <i>Use of reserve funds to provide liquidity</i> Aastha S. Khatwani, Joint Secretary and Financial Advisor, National Disaster Management Authority, Ministry of Home Affairs, India • <i>National compensation schemes for sub-national losses</i> Samantha Ward, Director, Emergency Management Policy Branch, Attorney-General's Department, Australia • <i>Ex post financial management of disasters</i> Noriyuki Mita, Deputy Vice Minister for International Affairs, Ministry of Finance, Japan
3:45 p.m. – 4 p.m.	Coffee Break
4 p.m. – 5:15 p.m.	<p>SESSION 4: Experience in pooling disaster risks</p> <p><i>Risk pools can be a useful approach for managing the financial impacts of disaster risks by aggregating a set of independent risks and potentially improving access to international reinsurance and capital markets. Such pools can be set up among the governments of multiple countries, local authorities and/or insurance companies. This session will share the experience of participants in a number of these different types of pool.</i></p> <ul style="list-style-type: none"> • <i>When is risk pooling an effective solution to the financial management of disaster risks?</i> • <i>What are the challenges to establishing risk pools and what are the potential benefits that can be derived?</i> • <i>How is a fair allocation of costs/premiums established?</i> • <i>What is the optimal relationship between the manager of the pool and the participants?</i> <p>Moderator: Mr. Olivier Mahul, Disaster Risk Financing and Insurance Program Manager, World Bank</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Risk sharing among local governments: New Zealand's experience</i> Craig Stobo, Chair of the establishment board for a New Zealand Local Government Risk Agency • <i>Multi-country catastrophe risk pooling</i> Isaac Anthony, Chief Executive Officer of CCRIF SPC (formerly the Caribbean Catastrophe Risk Insurance Facility) • <i>Single peril reinsurance pools: the experience of Australia</i> Mike Pennell, Chief Underwriting Officer, Australian Reinsurance Pool Corporation
5:15 p.m. – 6:30 p.m.	<p>SESSION 5: Financial solutions to manage disaster risks</p> <p><i>Reinsurance and capital markets provide a number of financial solutions that allow for transfer of disaster risks ex ante or the funding of disaster financing requirements ex post. This session will provide an overview of these different financial solutions, including potential investor appetite for taking on such risks.</i></p> <ul style="list-style-type: none"> • <i>What preconditions are necessary for transferring risks to international reinsurance or capital markets?</i> • <i>When is it economical for a country to transfer fiscal risks to the global market?</i> • <i>Are complex risk transfer instruments an affordable approach for developing countries?</i>

	<p>Moderator: Timothy Bishop, Head of Division, Directorate for Financial and Enterprise Affairs, Organisation for Economic Co-operation and Development</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>World Bank disaster risk financial products</i> Miguel Navarro, Head of Banking Products, World Bank Treasury • <i>Alternative reinsurance and capital market instruments</i> Ivo Menzinger, Managing Director, Global Partnerships, Swiss Re • <i>Establishing triggers for capital market risk transfer</i> Stephen Moss, Director, Capital Market Solutions, RMS • <i>Institutional investors as source of financing for catastrophe risk</i> Peter Book, Head of Agriculture Asia Pacific, Guy Carpenter
7 p.m.– 8:30 p.m.	<p>Dinner</p> <p>Welcoming remarks by Dato' Bakarudin Ishak, Assistant Governor, Bank Negara Malaysia</p>
SEPTEMBER 18	
9 a.m.– 10:30 a.m.	<p>SESSION 6: The role of insurance in supporting financial resilience</p> <p><i>Insurance can play a critical role in the financial management of disaster risks. Studies have shown that countries with higher levels of insurance penetration suffer less economic disruption from disasters and recover more quickly than countries with limited insurance coverage. This session will explore the extent of underinsurance of disaster risks and the challenges to enhancing the level of financial protection provided by insurance in Asian countries.</i></p> <ul style="list-style-type: none"> • <i>What preconditions are necessary for the development of a disaster insurance market?</i> • <i>What challenges do Asian countries face in putting in place these preconditions?</i> <p>Moderator: Mamiko Yokoi-Arai, Principal Administrator, Directorate for Financial and Enterprise Affairs, Organisation for Economic Co-operation and Development</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Underinsurance of disaster risks</i> Maryam Golnaraghi, Director, Extreme Event and Climate Risks, Geneva Association • <i>Establishing the preconditions for disaster insurance markets</i> Arup Chatterjee, Principal Financial Sector Specialist, Asian Development Bank • <i>Challenges to the development of disaster insurance markets in South Asia</i> Nasreen Rashid, former Advisor, Securities and Exchange Commission of Pakistan • <i>Enhancing financial resilience: lessons from Canterbury</i> Bryan Dunne, General Manager of Strategy and Transformation, New Zealand Earthquake Commission
10:30 a.m.– 10:45 a.m.	Coffee break
11 a.m.– 12:30 p.m.	<p>SESSION 7: Supporting the development of an insurance culture</p> <p><i>One potential barrier to the development of disaster insurance markets in many countries is the lack of an insurance culture. Households and businesses in countries with less developed insurance markets aren't always aware of the potential benefits that insurance protection can provide, may have limited trust in insurance companies' capacity to provide financial protection or are unaware of the risks they face should they choose not to seek financial protection. This session will describe how countries' facing differing constraints and contexts have worked to address these issues.</i></p>

11 a.m.– 12:30 p.m.	<ul style="list-style-type: none"> • <i>What can be done to improve citizens’ understanding of the risks that they face?</i> • <i>What can be done to support the establishment of an insurance culture in countries with limited experience with insurance?</i> • <i>What contribution can an insurance regulator make to building trust in insurance companies’ capacity to meet their obligations?</i> <p>Moderator: Arup Chatterjee, Principal Financial Sector Specialist, Asian Development Bank</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Promoting risk awareness and developing insurance culture: GIAJ’s initiatives</i> Takashi Okuma, General Manager, International Department, General Insurance Association of Japan) • <i>The role of risk awareness in supporting demand for disaster insurance: ASEAN’s experience</i> Representative, ASEAN Insurance Council) (tbc) • <i>Building institutional capacity for development of insurance markets</i> Antonis Malagardis, Program Director, GIZ Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia • <i>Challenges in post-disaster claims management</i> John Doak, Insurance Commissioner of Oklahoma and Chair of NAIC Catastrophe Response Working Group
12:30 p.m.– 2 p.m.	LUNCH
2 p.m.– 3:30 p.m.	<p>SESSION 8: Disaster insurance as a tool to support the wider economy</p> <p><i>Insurance can take various forms to meet the differing needs of different segments of society. This session will explore the various types of public private partnerships that have been formed to overcome some of the challenges to providing financial protection for significant risks and/or to various segments of the economy.</i></p> <ul style="list-style-type: none"> • <i>What are the different approaches that can be taken to providing disaster insurance to different stakeholders?</i> • <i>What is the role of government in each of these areas?</i> • <i>How can governments prioritise sector(s) where intervention may be most needed?</i> <p>Moderator: Sumarjono, Director of Non Bank Financial Industry Statistics, OJK Indonesia</p> <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Extending financial protection to the underserved</i> Rowan Douglas, CEO, Capital, Science and Policy Practice and Chairman, Willis Research Network, Willis Group • <i>Earthquake insurance in Japan</i> Hidetaka Tabata, Depury Director, Financial System Stabilization Division, Ministry of Finance, Japan • <i>Reaching the most vulnerable with micro-insurance</i> Michael J. McCord, Chairman of the Board, Microinsurance Network and President, MicroInsurance Centre, LLC • <i>Climate Risk Insurance: G7 targets and implementation challenges</i> Ernst Rauch, Head Corporate Climate Centre, Munich Reinsurance Company
3:30 p.m.– 4 p.m.	<p>Conclusions and Closing Remarks</p> <ul style="list-style-type: none"> • Timothy Bishop, Head of Division, Directorate for Financial and Enterprise Affairs, Organisation for Economic Co-operation and Development • Arup Chatterjee, Principal Financial Sector Specialist, Asian Development Bank

11th Annual Conference Asian Forum of Insurance Regulators

April 22, 2016 (Friday)

Time	Session
8:30 a.m.– 10:30 a.m.	<p>Round Table</p> <p>Climate Change and Disaster Risk Financing</p> <p>>Climate Change and Insurance Supervision. This session explored the implication of climate related risks which can potentially impact the financial soundness of the insurance sector in Asia, and the supervisory approach that insurance regulators have made to adopt to address these uncertainties while taking suitable measures to reduce the protection gap.</p> <p>Moderator: Arup Chatterjee, Principal Financial Sector Specialist, ADB</p> <p>Panelists: Mamiko Yokoi-Arai, Principal Administrator and Head Insurance, OECD Peter Kohlhagen, Senior Manager, APRA, Australia Sultan ul Abedine Molla, Member, IDRA, Bangladesh Fatta Bahadur K.C., Chairman, Beema Samiti, Nepal Yoshirho Kawai, Secretary General, IAIS</p> <p>>Disaster Risk Financing and Role of an Enabling Environment. This session discussed the role that ex-ante (pre-loss) financing instruments, including insurance, reinsurance and capital markets risk transfer tools can play to meet immediate liquidity needs for emergency response, recovery and reconstruction post-catastrophe. Insurance supervisors could help by putting in place an enabling regulatory environment to support parametric products, micro-insurance schemes or catastrophe-linked securities (so catastrophe bonds), and insurance pools.</p> <p>Moderator: Arup Chatterjee, Principal Financial Sector Specialist, ADB</p> <p>Panelists: Warren Chang, General Manager, Taipei,China's residential earthquake insurance fund, Taipei,China Indrani Sugathadasa, Chairperson, IBSL, Sri Lanka T. S. Vijayan, Chairman, IRDAL, India</p>
10:30 a.m.– 11 a.m.	Tea Break

Disaster Risk in Asia and the Pacific

Assessment, Management, and Finance

This report summarizes the proceedings of the ADB–OECD Forum on Disaster Risk Financing, held 15–16 September 2015 at the ADB headquarters in Manila; the Global Seminar on Disaster Risk Financing: Towards the Development of Effective Approaches to the Financial Management of Disaster Risks, held 17–18 September 2015 in Kuala Lumpur; and the Asian Forum of Insurance Regulators Roundtable, held 22 April 2016 in Taipei, China. The Manila forum identified options for sharing practices and experiences in strengthening financial resilience against disasters. The Kuala Lumpur seminar aimed to help establish a framework for development of disaster risk financing strategies supporting the capacity of the government and insurance industry. The Taipei, China conference examined the effects of climate change and disaster risk financing on the insurance industry.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to half of the world's extreme poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



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ASIAN DEVELOPMENT BANK
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org