PCDIP Philippine City Disaster Insurance Pool

ADB

Canada

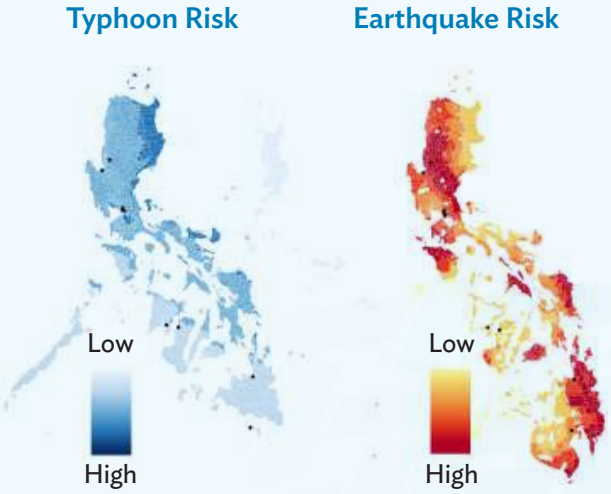
DEPARTMENT OF FINANCE
REPUBLIC OF THE PHILIPPINES

Disaster Risk

The Philippines is located in one of the world's most disaster-prone regions. Positioned on the Pacific Ring of Fire and within the Western North Pacific basin, it is exposed to earthquakes, volcanic eruptions, and severe typhoons. The country also experiences floods, droughts, and landslides. Levels of typhoon and earthquake risk vary across the country (Figure 1).

The Government of the Philippines has undertaken several steps in recent years to enhance disaster resilience. These have included initiatives both to reduce risk and to strengthen preparedness for potential events. The Philippines has emerged, in particular, as a leading nation among emerging economies in Asia regarding its approach to financial preparedness for disasters. As part of its efforts, the government formulated a Disaster Risk Financing and Insurance Strategy in 2015. This strategy provides a framework for enhancing financial resilience at national, local, and individual levels (Figure 2).

Figure 1 : Overview of Disaster Risk in the Philippines



Source: Risk Management Solutions, Inc. 2018.

Figure 2 : Framework for Disaster Risk Financing in the Philippines

National level: Improve the financing of post-disaster emergency response, recovery, and reconstruction needs.

Local level: Provide local governments with funds for post disaster recovery and reconstruction efforts.

Individual level: Empower poor and vulnerable households and owners of small and medium-sized enterprises to quickly restore their livelihoods after a disaster.

Source: Republic of the Philippines. 2015. *Disaster Risk Financing and Insurance Strategy.* Manila.

City Needs and the Philippine City Disaster Insurance Pool

Philippine cities typically face particularly high disaster risk, reflecting the concentration of people, assets, infrastructure, and economic activities in urban areas. City governments also shoulder a high level of responsibility for disaster risk management and associated costs. As a result, there already exist mandated budgeting mechanisms for cities to allocate financing for disaster risk management through their Local Disaster Risk Reduction and Management Funds. Nevertheless, cities often face significant challenges in securing adequate resources for post-disaster operations, including rapid access to funding to support early recovery efforts such as the restoration of critical infrastructure, delivery of services, and support of livelihoods. Delays in early recovery increase the impact of disasters on local and national economies, as well as on the economic and social welfare of those affected.

The Philippine City Disaster Insurance Pool (PCDIP) has been developed to address this need for rapid access to early recovery financing. As such, PCDIP directly supports the second (local) of the three tiers of disaster risk financing under the government's 2015 *Disaster Risk Financing and Insurance Strategy*.

Participants in the Design of the Pool

The Philippine Department of Finance led the design of PCDIP, with technical assistance from the Asian Development Bank (ADB).[1] ADB engaged a consortium of leading national and international experts to design the insurance pool.[2] Legal advice was also secured and relevant national government agencies consulted.[3]

Ten cities participated in the design of the pool. Their selection was based on a range of factors including disaster risk, demographic and economic size, geographic location, data availability, and disaster risk management governance. The relative scale of government and public facilities, and thus of potential post-disaster levels of expenditure, was also considered. Two cities from each of Luzon, Visayas, and Mindanao were selected, together with four cities from Metro Manila. The cities comprised of Bacolod City, Baguio City, Butuan City, Caloocan City, Dagupan City, Davao City, Iloilo City, Marikina City, Parañaque City, and Quezon City. Once implemented, the pool is expected to expand to cover additional cities.

To support the optimal design of PCDIP, these cities were engaged in a number of activities:

- **Exposure data collection.** To inform an understanding of the disaster risks faced by each city and potential post-disaster financing requirements, an exposure dataset of public and private "vertical assets" was developed with the support of each city, describing all buildings within the city boundaries but excluding roads, railways, and underground infrastructure. This database was used as an input to the Risk Management Solutions Philippine earthquake and typhoon risk models to quantify the level of risk faced by each city.

- **Needs assessment.** Existing disaster risk financing arrangements in each city were mapped and combined with outputs of the risk models to determine levels of additional financial support required by each city to meet early recovery spending needs following earthquakes and typhoons of varying severities.

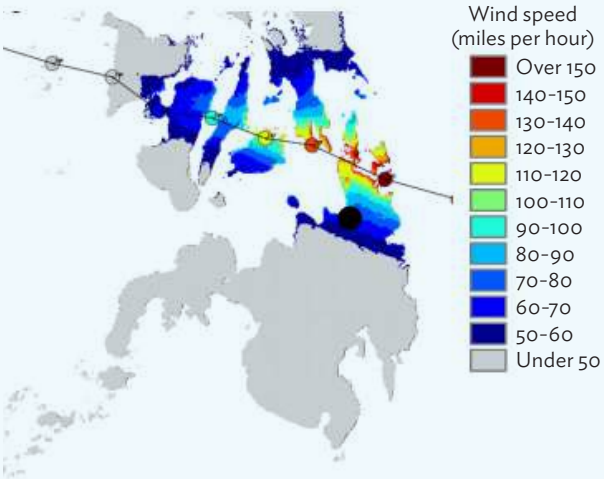
- **Capacity building.** Two national workshops were held to inform the design of PCDIP and secure feedback on the proposed structure. A three-part capacity development program was also provided to each city to secure a deeper understanding of disaster risk financing and enable city officials to make informed decisions on participation in PCDIP.

Key Design Features

PCDIP is intended to provide rapid post-disaster financing for early recovery in a cost-efficient manner. A parametric insurance pool was identified as the best solution to achieve this.

Parametric insurance payouts are determined based on the physical features of a natural hazard event, such as wind speed for typhoons (Figure 3) or ground-shaking

Figure 3 : Example Event Hazard Data, Wind Speed Measured in 3-Second Peak Gusts



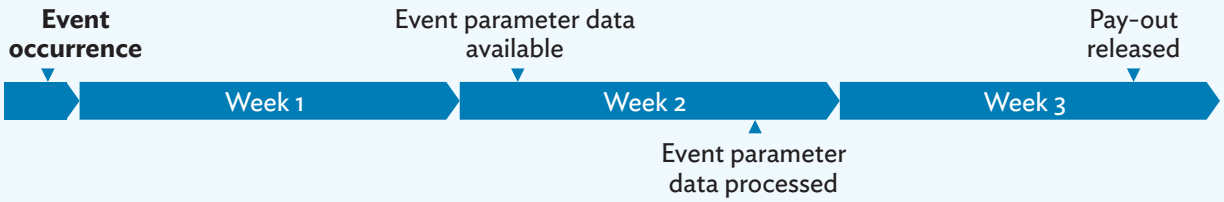
Source: Risk Management Solutions, Inc. 2018.

[1] ADB. 2015. *Technical Assistance for Enhanced Use of Disaster Risk Information for Decision Making in Southeast Asia.* Manila. Funded by the Government of Canada through the Integrated Disaster Risk Management Fund administered by ADB.
[2] The consortium was led by specialists from Risk Management Solutions, a risk modelling firm. Other consortium members included geospatial specialists from Earthquake and Megacities Initiative, economists from Vivid Economics and insurance specialists from reinsurance broker Willis Towers Watson.
[3] Legal advice was provided by Quisumbing Torres.

for earthquakes, rather than on actual losses suffered by a policyholder. The parameters chosen for these indices are those which most closely correlate to actual losses.

Verification of the parameters driving payouts is provided by reputable independent scientific agencies, which make physical parameter data publicly available very shortly after a disaster occurs (Figure 4). This approach means that payouts can be expected within 15 business days of qualifying disaster events, as they avoid the lengthy loss assessment required by traditional "indemnity" insurance.

Figure 4 : Expected PCDIP Timeline Following the Occurrence of an Event



Source: Asian Development Bank.

PCDIP will offer parametric insurance cover against typhoons and earthquakes in its first phase. It is expected that flood cover will also be offered once existing data and modeling challenges have been addressed. Parametric indices will be calculated individually for each city, based on spectral acceleration (a measure of ground motion[4]) for earthquake cover and on 3-second peak wind gusts (a measure of wind speed) for typhoon. These physical parameters will be measured at the center of each barangay and weighted according to the proportion of the relevant city's assets located in that barangay.

The rapid payouts available through PCDIP will complement existing post-disaster financing arrangements, such as indemnity insurance purchased through the Government Service Insurance System (GSIS) which is targeted at longer-term financing needs during the post-disaster reconstruction phase.

The parametric cover will be offered through a risk pooling arrangement. A disaster insurance pool is a structure under which participating entities, in this case city governments, collectively buy insurance through a single platform. The pool essentially operates as an insurance company acting for the benefit of the insured cities. Insurance pools reduce the price of premiums in several ways:

- **Diversification.** A pool combines risk across multiple regions and types and levels of severity of natural hazard, reducing the variability (often termed volatility) of total losses experienced by the group as a whole and so leading to greater stability in the group's funding requirements, reduced capitalization and reinsurance (insurance purchased by an insurance company) costs, and therefore lower insurance premiums.

- **Economies of scale.** All insurance products have inherent costs associated with their set-up and their ongoing administration which cities can share by grouping together. These costs include licensing, structuring, setup, administrative, claims management, data and modeling, and regulatory and other statutory compliance costs.

- **Profit retention.** Profits made by a pool during years with fewer disasters can be retained within the pool, rather than being paid to shareholders of a commercial company.

[4] Spectral acceleration measures the acceleration experienced by an object (typically a building) during an earthquake due to movement of the ground.

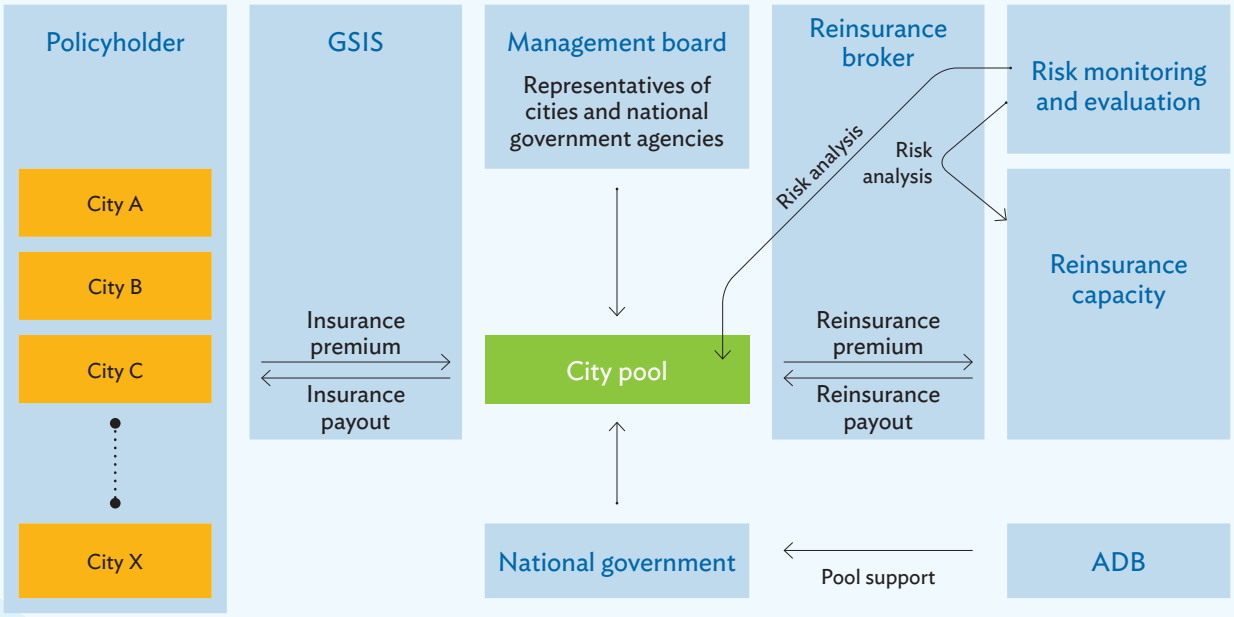
A risk pool also provides its members with an effective platform to increase their disaster risk management knowledge and capacity. It provides a platform to share experiences and expertise, as well as conduct joint knowledge-building initiatives.

The success of parametric disaster insurance pools has been demonstrated at a sovereign level through facilities in the Caribbean,[5] the Pacific Islands,[6] and Africa.[7] Each of these provides payouts to its pool members upon the occurrence of a disaster of a predetermined size and has demonstrated its ability to operate on a financially stable basis.

Legal and Administrative Structure

It is proposed that GSIS will sponsor the creation of PCDIP as a special purpose vehicle within GSIS.[8] PCDIP assets will be ring-fenced from GSIS's assets. The legal and administrative structure of the pool is indicated in Figure 5, subject to any further refinement.

Figure 5 : Proposed Pool Structure



ADB - Asian Development Bank, GSIS - Government Service Insurance System

Source: Asian Development Bank.

[5] Caribbean Catastrophe Risk Insurance Facility. https://www.ccrif.org/.
[6] Pacific Catastrophe Risk Insurance Company. http://pcrafi.spc.int/.
[7] African Risk Capacity. http://www.africanriskcapacity.org/.
[8] The term "special purpose vehicle" is used in a general sense. A special purpose vehicle is an "off balance sheet vehicle."

Insurance cover under the pool is proposed to work as follows:

1. Risk modeling services will be provided by an external provider and used to set premium levels for individual cities.

2. City governments (the policyholders) will buy parametric insurance from GSIS.

3. GSIS will pass the premium through to the PCDIP company, which will act as a reinsurer to GSIS. GSIS will take a small fee (known as a fronting fee) to perform the service of providing the city insurance policies and handling payouts.

4. The PCDIP company will directly reinsure with the domestic and international reinsurance markets. Risk modeling services will be used to determine the level and structure of reinsurance that the company should buy.

5. PCDIP will channel any payouts to cities through GSIS within 15 business days from the date of the disaster. PCDIP itself may receive payouts from its reinsurers based on its reinsurance policies.

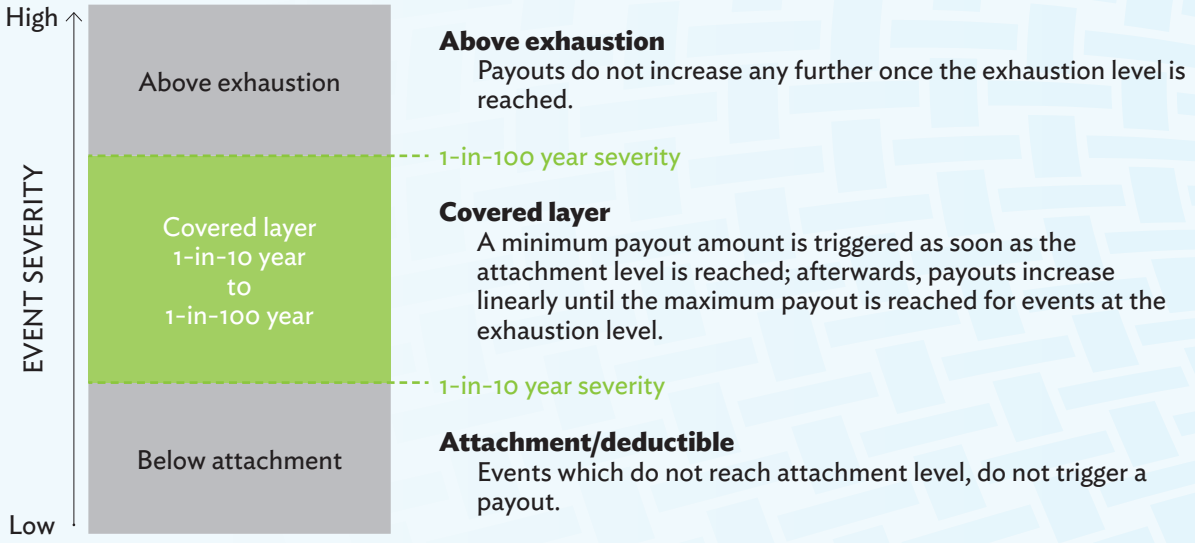
Payouts will be used for the early recovery of public infrastructure, in accordance with guidance provided by the Commission on Audit.

Selecting Insurance Coverage

Cities will purchase insurance cover from PCDIP based on the type(s) of hazard they want to insure against, the frequency and scale of payouts they would like to receive, and the funding available for premium payments.

The policies will provide payouts on a linear scale according to the frequency of payouts selected, "attaching" with a minimum payout at the selected trigger point and providing increasing payouts up to the selected "exhaustion" level, at which point the entire policy limit is paid. Figure 6 provides an example of a policy attaching at a return period of 1-in-10 years and exhausting at a 1-in-100-year return period. Return periods quantify the likelihood of an event of a certain severity occurring. For example, a 1-in-10-year event can be expected to occur once in 10 years, when assessed over the very long term, that is, it has a 10% chance of happening in any one year. More severe events are generally less frequent and as such have higher return periods. Each city will be supported in understanding its disaster risk and related financing needs, particularly for post-disaster early recovery.

Figure 6 : Summary of Insurance Policy Terms



Source: Asian Development Bank.

The premiums paid by each city will be based on the level of risk which that city individually brings to the pool. There will be no cross-subsidization of premiums among participating cities.

Table 1 shows three sample insurance options that cities could hypothetically select.

Table 1 : Layer Options Based on Defined Event Return Period Targets

	Earthquake		Typhoon	
	Attachment (Return period)	Exhaustion (Return period)	Attachment (Return period)	Exhaustion (Return period)
Layer option 1:	1-in-10	1-in-25	1-in-50	1-in-100
Layer option 2:	1-in-25	1-in-50	1-in-100	1-in-150
Layer option 3:	1-in-10	1-in-50	1-in-50	1-in-150

Source: Asian Development Bank.

Based on these options, the financial model developed in designing PCDIP was used to calculate the level of protection (i.e., the maximum payout) that could be provided if a ₱1 million annual premium was paid by four different cities with varying levels of earthquake and typhoon risk (Table 2). As can be seen, the same annual premium purchases a lower level of typhoon protection than earthquake protection since the typhoon cover indicated pays more frequently that the earthquake cover, reflecting the lower return period for major typhoons.

Table 2 : Coverage Amounts Purchased for a ₱1 Million Premium
Sample Cities and Layer Options

City	Option 1 (million ₱)		Option 2 (million ₱)		Option 3 (million ₱)	
	Earthquake	Typhoon	Earthquake	Typhoon	Earthquake	Typhoon
A (North)	50.8	10.9	90.4	25.4	60.7	14.7
B	52.2	11.0	90.9	25.2	63.4	14.9
C	53.2	11.2	91.5	25.4	66.2	16.3
D (South)	51.8	13.7	90.9	27.8	63.0	23.0

₱ = Philippine peso

Source: Asian Development Bank.

Unutilized annual transfers from cities' quick response funds to special trust funds could provide a source of premium funding and increase the cost-effectiveness of those resources relative to the current practice of accruing resources in special trust funds for use in the event of a disaster. Using part of those resources for PCDIP premiums would leverage or increase the post-disaster funding available to cities in the event of typhoons and earthquakes that trigger insurance payouts.

Pool Financing and Capitalization

PCDIP has been carefully structured to ensure that city governments can afford premiums (via flexibility in choosing their cover), that the pool is able to honor payouts in a timely manner, and that the pool is financially sustainable over the long term. Payouts will be funded by a combination of pool capital, initially established through seed capital, and reinsurance protection purchased from domestic and international markets. The initial pool capital will be provided by the government, which is expected to secure a sovereign loan from ADB for this purpose. This will be supplemented by retained profits should PCDIP benefit from years of low disaster loss. The level of reinsurance purchased each year will be driven by the level of risk transferred to the pool by the cities, available capital in the pool, the price of reinsurance from traditional reinsurance and/or capital markets and, crucially, the level of protection required by PCDIP.

Benefits of the Philippine City Disaster Insurance Pool

- Fiscal resilience of the cities bolstered
- Financially sound budget utilization in a risk transfer instrument with predictable payout expectations
- Allows cities to become more self-sustaining in managing disaster risks and repairing critical infrastructure and assets
- Quicker local economic recovery
- A solution to narrow the funding gap between available resources and post-disaster response costs for severe events
- Cities enjoy the numerous benefits of a pool structure, including diversification, economies of scale, and knowledge sharing

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