Understanding Risk Financing and Assessment: Living Case Studies
Crisis and Disaster Risk Finance (CDRF), World Bank Group
Welcome and Introduction

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Understanding Risk
Finance and Assessment

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Crisis
SHARK SIGHTED TODAY

ENTER WATER AT OWN RISK
Financial Risk Management of Public Assets

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Case Study: The Philippines Perspective

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Financial Risk Management of Public Assets

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Financial Risk Management of Public Assets

Benedikt Signer
Program Coordinator
Disaster Risk Finance and Insurance Program

THE WORLD BANK
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US$94 trillion in infrastructure investment needed globally between now and 2040 to maintain growth and reduce poverty.
US$400 billion+ estimated annual cost of disruptions and damages to energy and transport services and infrastructure in low- and middle-income countries globally.
Risk finance as part of a broad risk management strategy

- **AVOID**: removing the exposure to the hazard
- **REDUCE**: actions to reduce vulnerability and increase resilience
- **RETAIN**: accept the consequences of the risk
- **SHARE/INSURE**: transferring or sharing a portion of the risk, through finance
Two objectives:

Protect society by ensuring funding for continuity of services in line with service planning and standards.

Protect the government balance sheet through efficient management of contingent liabilities.
Risk data needs for Public Asset Risk Financing

**Who uses the data?**
- Government stakeholders
- Risk modelers
- Brokers or Underwriters

**What types of data?**
- Location of main assets
- Types of buildings
- Building design
- Business continuity planning
- Protective equipment
- Building materials
- Contents

**Tools and analytics**
- Public asset registries
- Historical Data (loss)
- Catastrophe models
**Minimum standard**
- **Schedule of values**
  - Location Name
  - Each location geocoded to street address (at least 90% of schedule)
  - Total Insured Value at each location split at high granularity (i.e. physical property, contents, stock, hardware/software, fine art, business interruption)
  - Occupancy at each location
  - Number of Buildings
  - Primary modifiers to include construction, year asset built and number of stories of the building
  - Square Footage of Location

- **Loss experience**
  - Date of Loss
  - Cause of Loss (Peril)
  - Location of Loss
  - Gross total incurred loss to asset
  - Deductible applicable to loss
  - Net loss payable by insurers
  - Status of Claim (open/closed)
  - 5-year average claim experience by year

- **Valuation methodology**
  - Basis of reinstatement: replacement cost value (RCV) versus Actual Cash Value (ACV)
  - Evidence that value per square foot is adequate for occupancy type and in line with current building code costs.
  - Evidence that inflation is being considered year on year

**High Quality**
- **Schedule of values**
  - Major Renovation Information
  - Protection details: sprinkler systems, security (Alarms, Security Staff etc.), other additional protections
  - Basement/Parking Information
  - Catastrophe Zone of each location (For Flood, Earthquake and Typhoon)
  - Secondary Modifiers collated from building diagrams. These may include EQ resiliency such as base isolation, cladding type, foundation information, pounding, bracing.

- **Loss experience**
  - Detailed description of loss outlining sequence of events (generally only necessary for meaningful loss amounts and not small losses)
  - Mitigation steps taken by client to prevent future similar losses.

- **Valuation methodology**
  - Appointment of professional appraisal firm to value all assets on the schedule on a rolling 3-5-year basis.
Valuation methodology

Appointment of professional appraisal firm to value all assets on the schedule on a rolling 3-5 year basis.

Schedule of values

- Location Name
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Loss experience

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It takes time and effort. How can YOU make it easier for governments?

What can you do if the data for indemnity insurance of public assets is **missing or of lower quality than expected**?

How can you compensate for missing or inaccurate **asset values**?

How can you support **asset valuation** (especially replacement value)?

What technology is **ready for use to support data collection / management**?

How can **risk models** become more available and user-friendly to **financial decision makers**?

How can countries compensate for **missing loss history**?
The Philippines Perspective

Shannen Nicole Chua
Treasury Operations Officer, Bureau of the Treasury, the Philippines
THE PHILIPPINES PERSPECTIVE
CONTEXTUALIZING THE PHILIPPINE LANDSCAPE

- Data Sources
  - National Asset Registry System
  - National Disaster Risk Reduction and Management Council Reports
  - DOST GeoRiskPH
  - AIR Catastrophe Model
PHILIPPINE DISASTER RISK FINANCING STRATEGY

- **Indemnity Insurance**
  - National Asset Registry System

- Catastrophe Bonds
  - AIR Catastrophe Model

- Parametric Insurance
  - AIR Catastrophe Model

- Contingent Financing

- Disaster Funds

- Emergency Funding

- Reconstructing

- Transfer

- Retention
# National Asset Registry System

## Overview

- Registry Strategically Important Assets

## Rationale

- An indemnity insurance program would require asset information such as its location, replacement cost, condition, risk mitigating features, and the like.
- Asset data would be useful for overall asset management

## Getting the Data

1. Base: Excel template for minimum insurance data (sourced from the Insurance Commission)
2. Consultations with agency and key stakeholders on additional technical data to be put
3. Constant coordination with agency in filling up data fields
<table>
<thead>
<tr>
<th>General Information</th>
<th>Location Information</th>
<th>Legal / Ownership Information</th>
<th>Financial Information</th>
<th>Insurance Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Asset Number</td>
<td>Region, Municipality, City</td>
<td>Ownership</td>
<td>Book Value, Accumulated Depreciation</td>
<td>Sum Insurable (if not insured)</td>
</tr>
<tr>
<td>Organization/Agency Code</td>
<td>PSGC Code</td>
<td>Mode of Acquisition/Conveyance</td>
<td>Asset Life, Number of years used</td>
<td>Insurance Details (Amount insured, Coverage, Type of Policy, Amount Insured, Premium, and Deductible)</td>
</tr>
<tr>
<td>Asset Name/Type</td>
<td>Latitude</td>
<td>Conveyance Information</td>
<td>Sound Value/Assessed Value/Appraised Value</td>
<td></td>
</tr>
<tr>
<td>Property Number</td>
<td>Longitude</td>
<td>Acquisition/Conveyance Date</td>
<td>Mode of Disposal/Disposal Date</td>
<td></td>
</tr>
</tbody>
</table>
FUTURE PLANS

- **Interfacing:** Linkages with national government agencies and corporations as well as local government units that have their own asset registry to develop a common metadata set across the whole of government and to facilitate the sharing of information.

- **Standardizing:** Adoption/adaption of international standards for data inputs and quality to allow for regional collaboration.

- Easy Reference Dashboard with quick access to geospatial and asset information.

- Risk Modeling capabilities to estimate damages of events and forecast potential losses of incoming events.

- Simplified data gathering.
# Challenges and Recommendations

<table>
<thead>
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<th>Challenges</th>
<th>Recommendations</th>
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<tbody>
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<td><strong>Data Gathering</strong></td>
<td><strong>Capacity Building</strong></td>
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</tbody>
</table>
| Decentralized information  
National vs Regional vs Provincial vs City | Analytics Summary to accompany data results |
| Coordination with agencies/counterparts | Interactive Excel tools for data interpretation |
| Inconsistent quality of data | Leveling of information  
*not all information needed at the national level* |
| Data privacy and security concerns | |
SEADRIF Update and Future Programs

Gary Rynsard
Executive Director and Board Member, SEADRIF Insurance Company

Case Study: SEADRIF Flood Risk Monitoring Tool

Cathy Ansell
Financial Sector Specialist, CDRF, FCI Global Practice, WBG
SEADRIF Update and Future Programs

Gary Rynsard
Executive Director and Board Member, SEADRIF Insurance Company
SEADRIF Update and Future Programs

Gary Rynsard
Southeast Asia Disaster Risk Insurance Facility (SEADRIF)

To provide ASEAN countries with insurance solutions and advisory services to enhance financial resilience against disaster and climate shocks.

Cambodia, Indonesia, Japan, Lao PDR, Myanmar, Philippines, Singapore
SEADRIF as a full-service platform to strengthen financial resilience against disasters and climate shocks

From the start, SEADRIF has been established by member states to provide not just financial products and services, but also to catalyze regional collaboration and knowledge sharing, and to invest in joint public goods.
SEADRIF Insurance Company as part of the SEADRIF Governance Structure

- **Trustee**
- **Lead Technical Partner (World Bank)**
- **Secretariat (ASEAN Secretariat)**

**SEADRIF Trust Council of Members (CoM)**

- **Sub-Trust A (Committee)**
- **Sub-Trust B (Committee)**
- **Sub-Trust C (Committee)**

**SEADRIF Insurance Company**
SEADRIF Insurance Company Products and Services

- SEADRIF Insurance Company
- Flood Risk Model
- Insurance Market Development
- Capacity Building / Knowledge Exchange
- Future Programs

- Cat Risk Pool
- Public Asset Insurance Program
- Future Products
- Projects Under Other Programs
SEADRIF Insurance Company – First Catastrophe Risk Pool

- Product includes
  - Parametric section trigger for Medium flood disaster event triggers a partial payout
  - Parametric section trigger for Severe flood disaster event triggers a full payout
  - Finite section cover for an eligible disaster event
SEADRIF Flood Risk Monitoring Tool

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SEADRIF Flood Risk Monitoring Tool
Near-Real-Time Flood Monitor

The SEADRIF Near-Real Time Flood Monitoring tool provides a continuous view of flooding in Myanmar and Laos PDR.

The Tool combines model data, satellite imagery and gauge observations to provide a best estimate of the flooding situation on the ground.
Modelling a Flood Event

Satellite data, ECMWF Data, and Global Flood Forecasting Information System automatically retrieved by SEADRIF tool.

Tool selects best matching flood map for each data source through a series of algorithms.

Rules based algorithm selects the overall best flood hazard map for each sub area.

Flood map is then overlaid with the WorldPop population database.

Population in flooded areas > 25cm depth is calculated = population affected by current flood event.
Satellite Imagery

Sentinel-1 is one of the European Space Agency’s polar orbiting satellites which provides synthetic aperture radar imaging data.

- Flood imagery is available regardless of weather – it is not affected by cloud cover
- SEADRIF uses an algorithm specifically developed by Luxembourg Institute of Science and Technology to determine which areas are flooded in the satellite imagery
Satellite Extent Matching Algorithm

\[ S = \left( \frac{N_1 + N_2}{N} \right) \]
Satellite Extent Matching Algorithm

\[ S = \frac{N_1 + N_2}{N} \]
Satellite Extent Matching Algorithm

\[ S = \frac{N + N}{N} \]
Satellite Extent
Matching Algorithm

\[ S = \frac{N + N}{N} \]
Output Metric – Population Affected

The flood model exposure is derived from the WorldPop population database.

- 100 m resolution raster
- Freely available database
- Widely used throughout scientific community
- Combines remotely-sensed and geospatial datasets of settlement locations, roads, buildings, nightlights etc. to map the population across a country
- For SEADRIF, the model development team adjusted the data to 2015 census data in Myanmar at township level, and projected to 2018.
Data on Public Spending

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Case Study: COVID-19
Expenditure Analysis

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Data on Public Spending

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Data on Public Spending

Tatiana Skalon

Disaster Risk Finance Specialist,
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Context: Government Resources Are Always Limited... COVID-19 Made It Worse

Are we using limited resources effectively and efficiently? (inputs -> outputs -> outcomes)

Fundamental evidence on input is missing. (disaster spending is fragmented, complex, hidden)

Governments lack this evidence too!
Situation: Why evidence gap is a problem?

**DIFFICULT TO ANSWER QUESTIONS**

- How disaster damages translate into public spending?
- How to limit the post-disaster costs, e.g. by investing in risk reduction?
- How to find resources and design adequate sovereign disaster risk finance strategies?
- Did our investments achieve results? What are the challenges to disbursement of public funds?
First ever Public Expenditure Review (PER) on Post-Disaster Spending in the Philippines (and other two in Indonesia and Kenya):

- Focus on government spending AFTER disasters to establish a baseline
- Only partially covered efficiency, but did not cover long-term results
- On difference with other PERs, no cross-country comparison and preceding reviews

The PER in the Philippines helped to find:

- Key areas of spending (e.g. public infrastructure and social assistance)
- Sources of funds (agencies’ budgets <2 times as big as national reserve fund)
- Procedural bottlenecks, low utilization rates, incomplete reporting
Public budgets are the first source of post-disaster funding... 
...so more needs to be done to generate best practices:

- To build cross-country evidence
- To understand progress and changes
- To understanding budget reallocation
COVID-19 Expenditure Analysis

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COVID-19 Expenditure Analysis
Cross country analysis from Pakistan, Albania, South Africa, and Ethiopia

Stephanie Allan
Senior PFM Specialist, Oxford Policy Management

Dayna Connolly
PFM Specialist, Oxford Policy Management
Rationale

DRF literature points to the direct and indirect cost of disasters to government, including opportunity costs of budget reallocations.

But there is a lack of quantitative evidence on the scale budget reallocations, including the long-lasting effects on growth and development:

- As per the Philippines PER, reallocations are typically poorly documented and what decisions were made and why is forgotten once a crisis abates.

COVID-19 offers a live case study for us to analyse public expenditure decisions, with a focus on what wasn’t spent as a result of the pandemic.
How has COVID-19 changed public expenditure, and what is the impact of this?

1. **Financial Landscaping**
   - Review of the existing budgetary instruments & analysis of their usage in relation to Covid-19

2. **Counterfactual**
   - The outturns counterfactual can be established through utilising original budget documentation (before epidemic) and assessing deviations expected in “normal” years

3. **Expenditure Analysis**
   - Comparison of actual debt, revenue and expenditure against counterfactual baseline

4. **Procedural Analysis**
   - Review of the legal and institutional framework, alongside any guidelines on budgeting and expenditure procedures

5. **Impact Analysis**
   - Economic analysis of the estimated impact of cut or delayed expenditures in terms of social and economic returns foregone
Emerging Findings

- Impetus for difficult reforms
- No-regrets approach to first cuts
- Uncertainty manifesting in budget volatility
- Importance of rapid fungible development finance
- Unintended consequences from sectoral ring-fencing
- Political economy plays a role
- Establishment of new COVID-funds, despite existing contingency funds
- More extensive cuts expected in the medium term
- Fiscal year matters
- Impetus for difficult PFM reforms

Emerging framework for budget cuts:

1. Unviable expenditures
2. Paybill
3. Capital & associated O&M
Telling Your Risk Financing Story

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Telling your Risk Financing Story

Kaavya Ashok Krishna
Use what you know...
Create a shared experience...
Preparation | Flexibility
80% | 20%
Be clear and concise...
1 + 1 = 2

Keep it simple...
Storytelling = Storylistening...
BREAK
Join us for breakout sessions

- Data Need for Public Asset Insurance, hosted by Benedikt Signer
- SEADRIF Company + Flood Monitoring, hosted by Cathy Ansell
- Public Expenditure Reviews during Disasters, hosted by Tatiana Skalon

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Report Back and Conclusion

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