Knowledge Exchange Series on Building Sovereign Financial Resilience in Middle Income Countries

# Development of Catastrophe Bonds for Sovereign Disaster Risk Transfer

November 09, 2021

Disaster Risk Financing & Insurance Program
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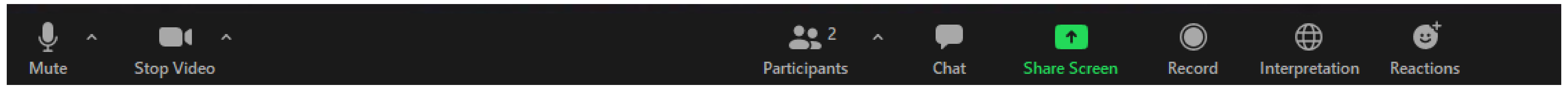


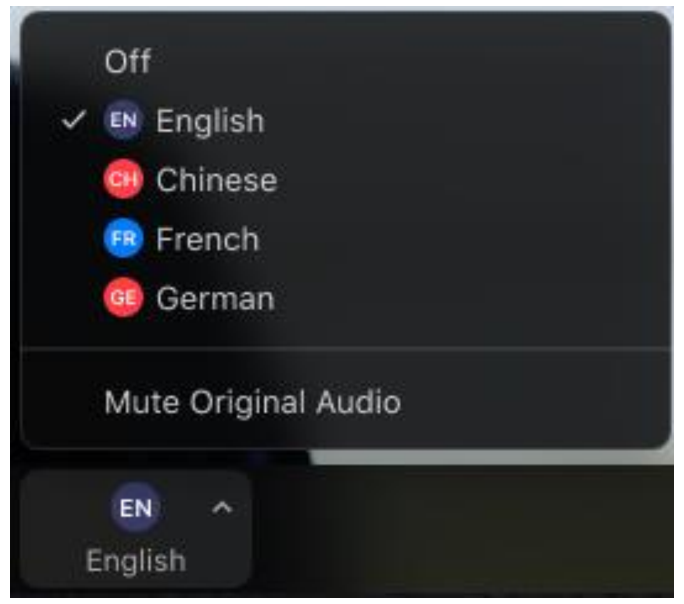


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# Opening Remarks

**Yira Mascaró**

Practice Manager, Finance, Competitiveness & Innovation (FCI), Latin America and Caribbean (LAC), World Bank Group (WBG)

# Overview

Middle-income countries face fiscal challenges in effectively responding to disasters, with many governments primarily relying on (short term) international support to fund disaster response.

Since 2012, Switzerland's State Secretariat for Economic Affairs (SECO) and the World Bank's Disaster Risk Financing and Insurance Program (DRFIP) have developed a joint program to support middle-income countries (MICs) in building their financial resilience against natural disasters. The Sovereign Disaster Risk Financing and Insurance Program for Middle-Income Countries (the Program) is one component of a broader WB-SECO partnership on fiscal risk management for MICs.

This webinar series, as part of the Program, aims to: assist governments with developing and implementing more effective and cost-efficient financial protection strategies to better manage government disaster related contingent liabilities; and bring countries together to share knowledge, experiences and good practices on disaster risk financing.


# Webinar Series

## 1-2

**Policies and frameworks for managing disaster related contingent liabilities**

Webinar 1: Managing disaster related contingent liabilities

Webinar 2: Fiscal & financial resilience for subnational governments

## 3-5

**Instruments for financial management of disasters**

Webinar 3: Disaster reserve funds

Webinar 4: Sovereign disaster risk insurance

Webinar 5: Development of Catastrophe Bonds for Sovereign Disaster Risk Transfer

## 6

**Market development for disaster risks**

Webinar 6: Catastrophe risk insurance markets development

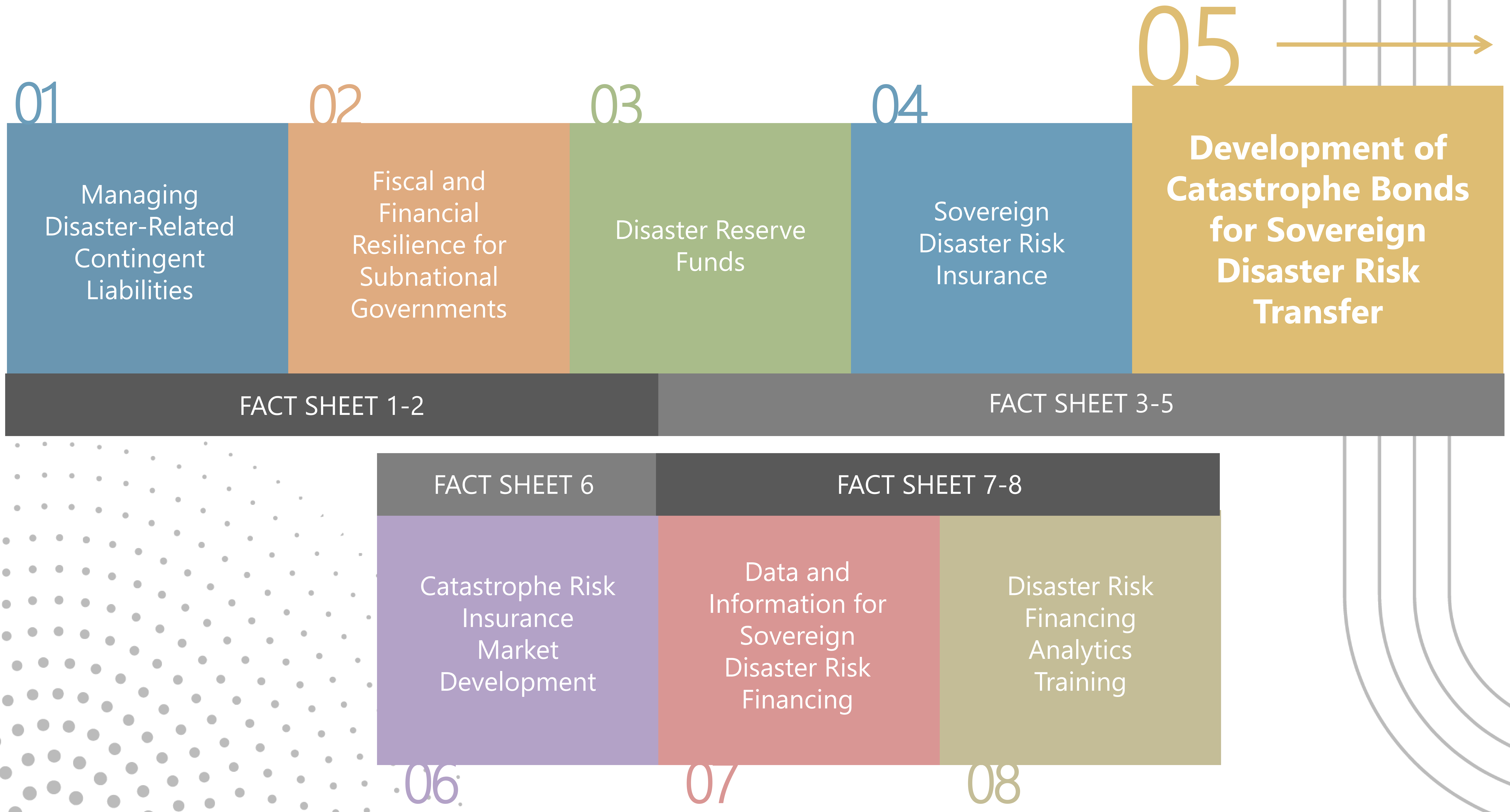
## 7-8

**Data, information and analytics for sovereign risk financing**

Webinar 7: Data and information for sovereign DRF

Webinar 8: DRF analytics training

# Webinar Road Map



# Structure of Webinars

Total of 8 Fact Sheets & 8 webinars

Different guest speakers

Live audience polls: Please participate

Q&A: Please share your questions via chat box (If possible, please indicate which speaker(s) to address your question(s))

Simultaneous interpretation

Please be patient with interpreters when lag time occurs!

Certificate of Participation

# Certificate of Participation

Participants will have an opportunity to obtain certificate(s) on successful completion of following criteria:

**Certificate of Participation**: Participants need to attend 4 out of 5 webinars and complete a short survey

**Certificate of Completion**: Participants need to attend 7 out of 8 webinars and complete a short survey

Scan the QR Code to access the mid-term survey.

# Word Cloud: Where are you currently based?

**Option 01**

Go to www.menti.com

**Option 02**

Scan the QR Code →

Use Code: 4308 4301

# Poll 1: Recap

What was the last Webinar about?

- Importance of sovereign disaster risk insurance
- Key considerations in setting up sovereign disaster risk insurance
- I did not attend the previous webinar – this is my first time
- I don't remember

**Option 01 –**
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# Disaster risk finance strategies: CAT Bonds as part of the solution

**José Angel Villalobos**
Senior Financial Sector Specialist, WBG

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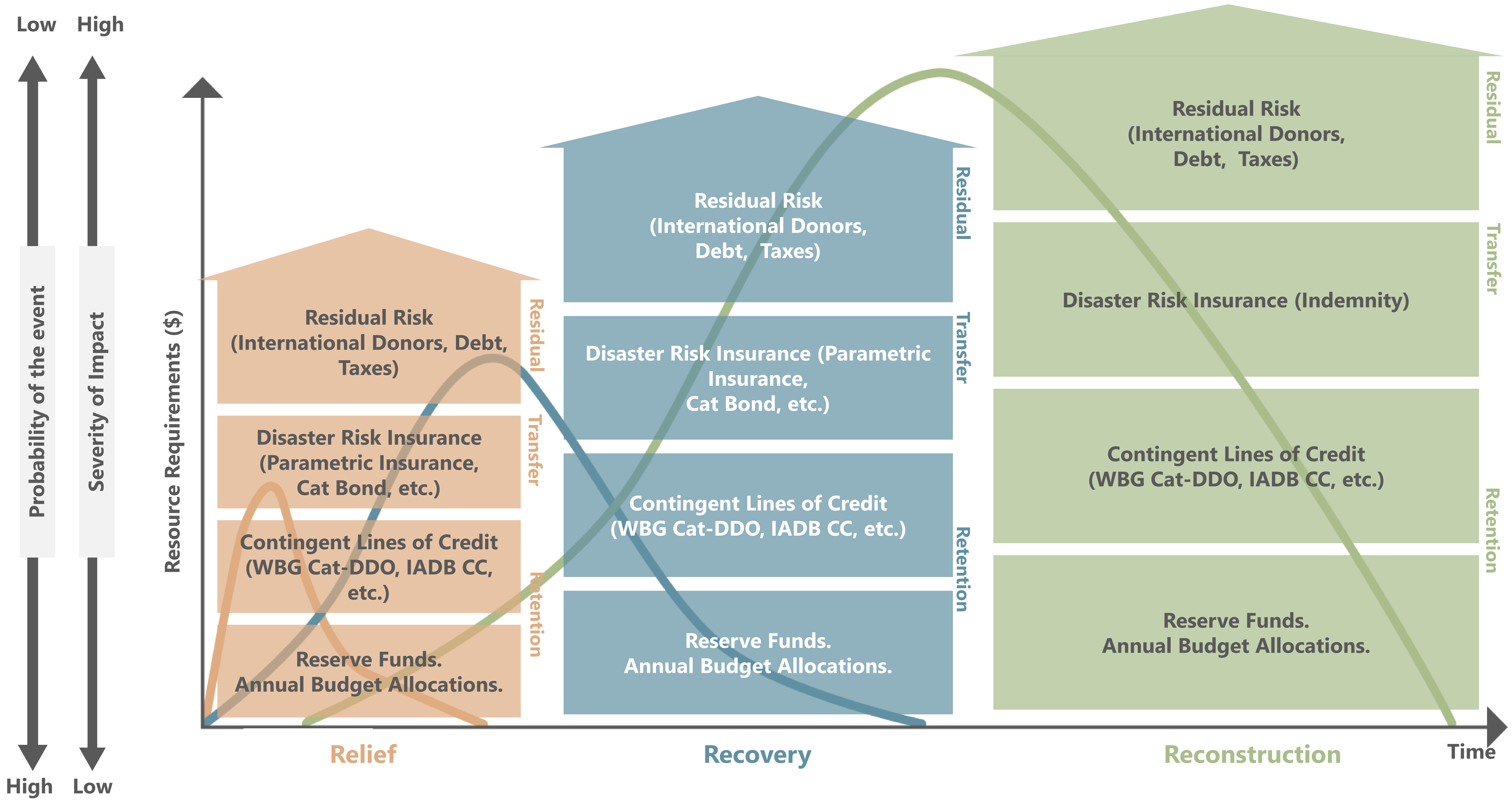
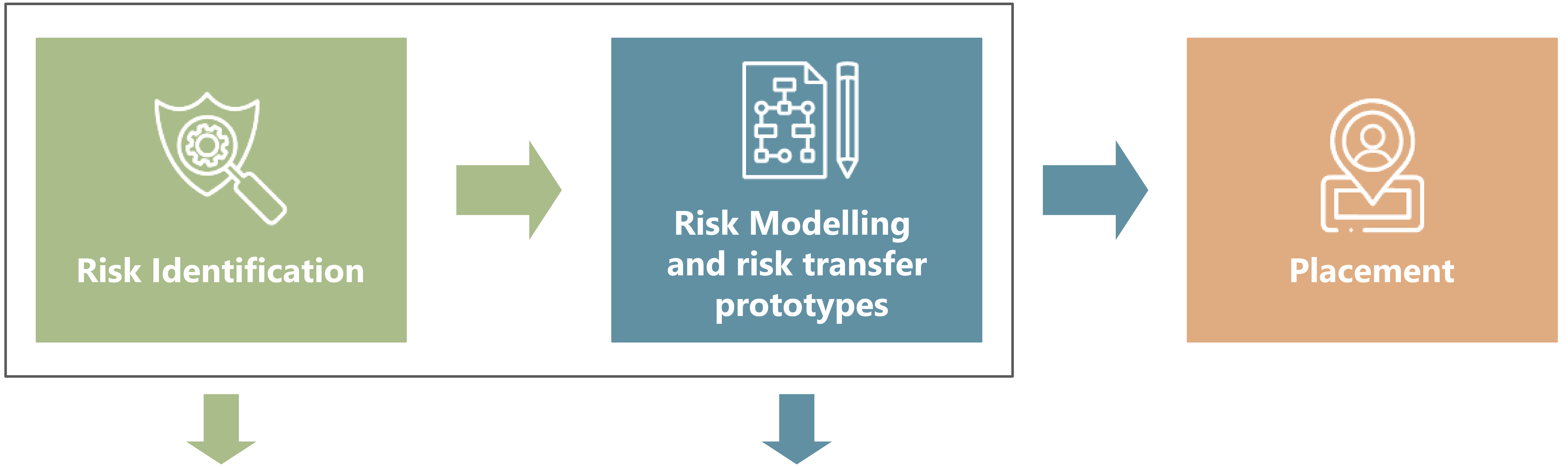
# Principles of Disaster Risk Finance



# CAT Bonds

## World Bank Technical Assistance




- Definition of the CAT bond objective and the risk(s) to be covered.
- The national technical and scientific agencies should be involved at this stage.

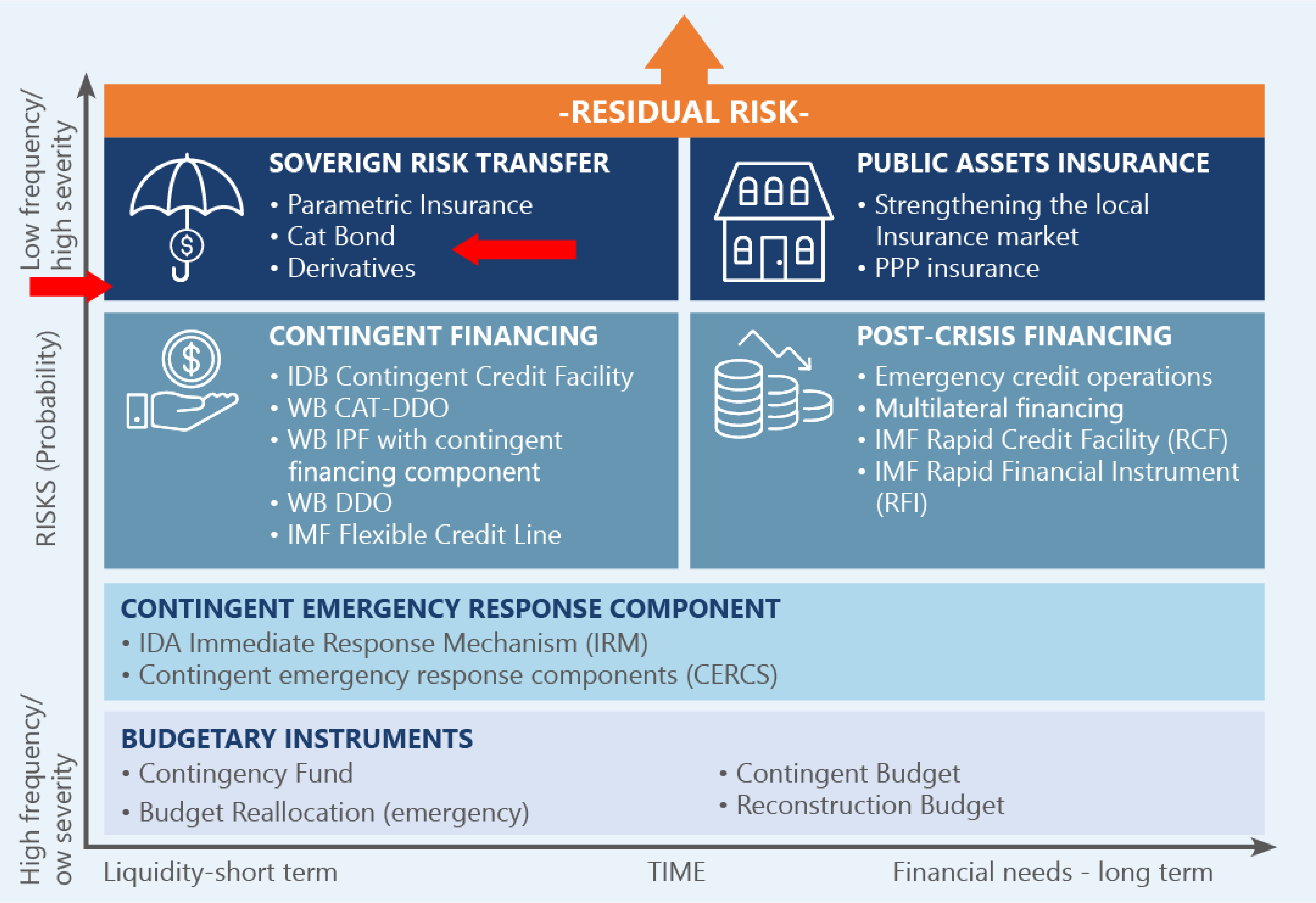
Strengthen technical capabilities to make informed decisions

**Gap analysis**: Compares potential losses and available financing instruments to analyze: (i) the reasonableness of the hedge acquisition and its order of priority within a layered strategy; and (ii) the probability of exhaustion of each instrument and the whole strategy.

**Cost-benefit analysis:** Calculates the present value of the opportunity cost of the different strategies. It shows the benefits (or otherwise) of a strategy with respect the status quo one.

A single instrument is not the solution; rather, a full range of risk retention and transfer instruments should be combined in a DRF strategy to achieve cost-effective and timely funding for post-disaster needs.

## Jamaica: Disaster Risk Financing Strategy - July 2021




Source: The GoJ and authors

***Fitch Ratings 2021***

Jamaica Cat bond:

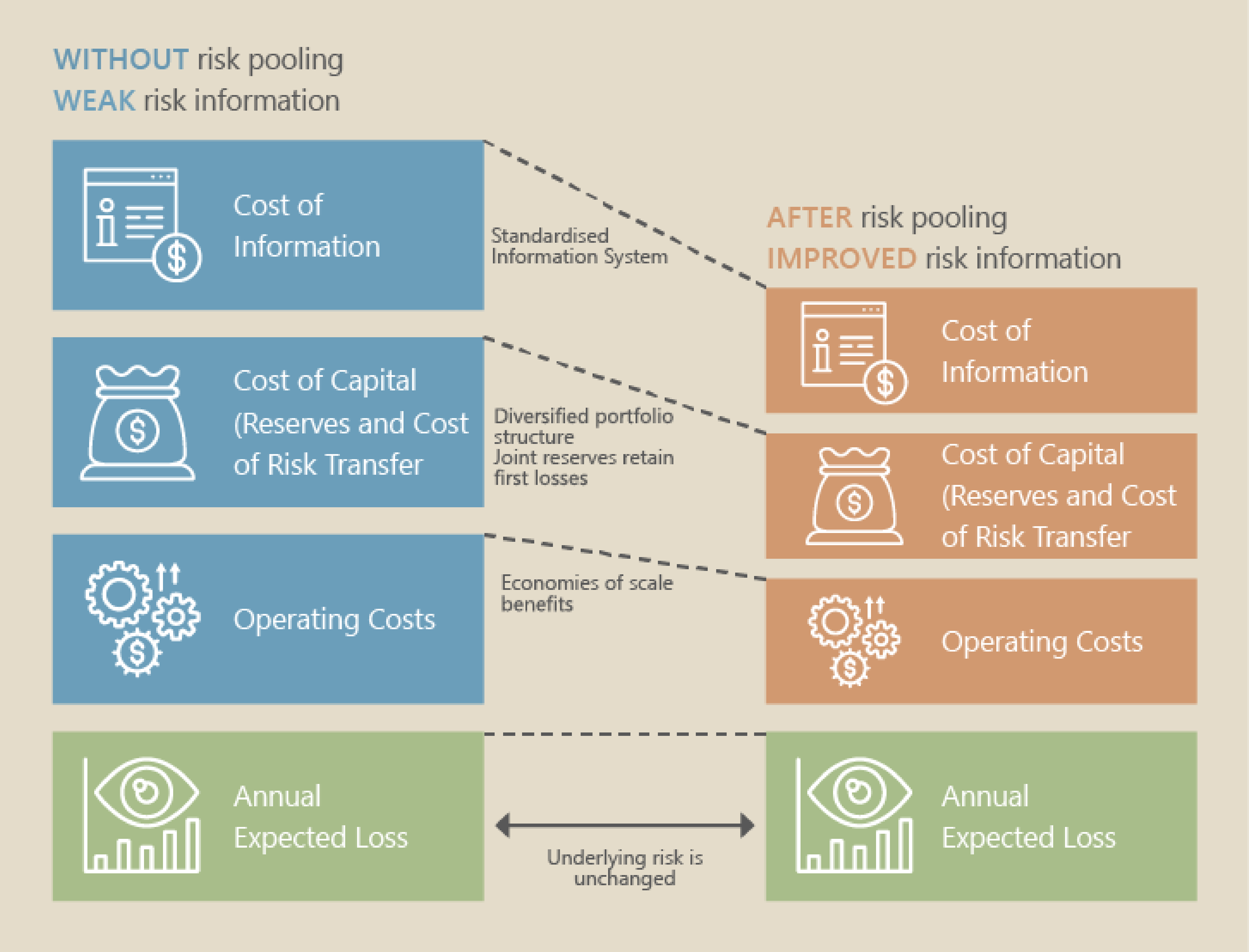
*It "significantly strengthens the country's natural disaster risk-mitigation strategy." and that "this bond does not add to the national debt"*

# Multi-country CAT bonds: opportunity for lowering costs and premiums

**Multi-country CAT bonds p advantages:**

(i) savings by sharing the structuring costs of the bond issuance; and

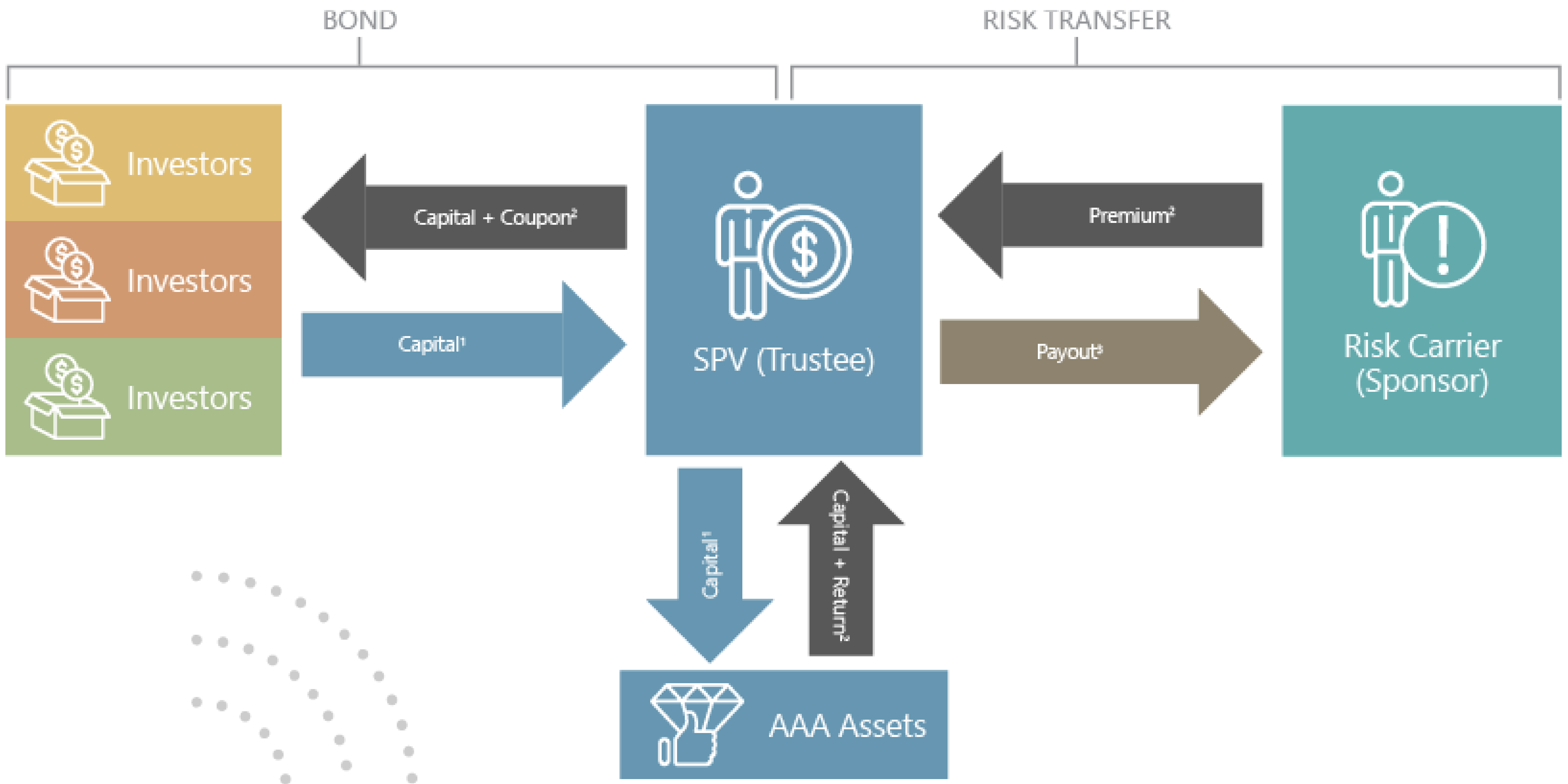
(ii) reductions in the price of the hedge (premium) due to risk diversification.




2018: the **Pacific Alliance countries** issued a US$ 1.360 billion CAT bond. Largest sovereign risk insurance transaction conducted, and the second largest issuance in the history of the CAT bond market.

**2007: Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC).** Parametric insurance that makes payments as long as the losses caused by a tropical cyclone, earthquake, excess rainfall or fishing exceed the amount predefined by the country and agreed in the contract.

# CAT Bond General Transaction




1. Fully collateralized transaction: at inception, SPV collects fund from investors and invest in AAA-assets (risk-free).

2. If no covered event occurs, investors recover their capital plus a coupon composed by AAA-assets return (risk free) and the premium paid by the sponsor.

3. If a covered event occurs, the sponsor receives a payout and the investors loss their capital (all or part).

Remark: the bond is issued by the SPV and does not represent indebtedness for the sponsor, who is buying a risk transfer instrument.

# Some lessons learned

Provide the countries with financial relief and helped them to respond quickly after a disaster.

Complement other financial instruments. They are most cost-effective when they are part of comprehensive DRF strategies.

The joint work of the WB TA and governments for the development of prototypes, the gap and cost-benefit analysis strengthen the technical capabilities of government officers.

Multi-country CAT bonds (such as the Pacific Alliance CAT bond) can provide advantages for both countries and investors, including:

- Savings by sharing the structuring costs of the bond issuance; and
- Reductions in the price of the hedge (premium) due to risk diversification.

Can be placed during crises. For example, the Jamaica's sponsored CAT bond was placed during the challenging time of the COVID-19 pandemic.

**Work in progress!** Challenges arise from:

- Some hazards,
- The reduction of basis risk, and
- Communication with the population

# Annex 1: CAT Bonds: Characteristics

## Characteristics

- **Does not represent indebtedness for the sponsor because payouts come from the risk transfer transaction.**
- Allow entities exposed to disaster risk to transfer a portion of that risk to the capital markets.
- Generally, cover higher risk layers within a comprehensive DRF strategy with a risk-layering approach.

## Difference between Cat Bonds and insurance:

| Criteria | CAT Bonds | Insurance |
|---|---|---|
| Market | Capital markets: client access to a much larger pool of investors. | (Re)insurance markets: smaller pool of capital from the (re)insurance industry. |
| Term | Typically, longer coverage periods of 3 to 5 years are available; these allow sponsors to lock in premium rates. | Typically, there is a one-year coverage period. |
| Credit Risk | Fully funded transactions. There is no risk of default by the investors taking the risk. There is also no risk of missed or late payments because the transaction is fully collateralized. | No upfront payments are made by the insurer; the insurer only makes payments if and when a triggering event occurs. Therefore, the client is exposed to the potential default or late payments of the insurance providers. |
| Documentation and Transaction Costs | Complex documentation and large transaction costs. | Usually, this involves less complex documentation and lower transaction costs. |

# Annex 2: CAT Bonds

## Benefits and limitations

| Benefits | Limitations |
|---|---|
| • Payouts are rapidly made and do not increase country's debt.<br>• Alternative to conventional insurance, when seeking large coverage amounts.<br>• Multi-year coverage: year-to-year volatility is avoided.<br>• Efficient price discovery: Syndication to a large number of global investors.<br>• Tradable instruments with observable, secondary market pricing.<br>• Appeal to investors seeking uncorrelated assets and diversification.<br>• Fully funded transactions: no sovereign debt impacts and no risk of missed or late payments.<br>• Comparable to conventional (re)insurance (except for very low or very high expected loss transactions).<br>• Fixed costs over the life of the bond. | • Complex structuring requirements in terms of establishing the SPV and Collateral Account (these are not required for World Bank-issued CAT bonds).<br>• Run a greater basis risk than non-parametric insurance.<br>• Sophisticated technical knowledge is needed.<br>• More parties and agreements are involved with the due diligence required prior to issuance. |

# Annex 3: Type of trigger definition: Trade-off between several features of the instrument

| | Type of Trigger | | | |
|---|---|---|---|---|
| | **Indemnity** | **Industry Loss Index** | **Modeled loss** | **Parametric** |
| **Payout Trigger** | Actual loss incurred (for example, damages to buildings, crop losses, livestock deaths, and so on). | Estimate of the total indemnity losses experienced by the insurance industry in the region insured. | CAT model's estimate of the incurred losses based on actual event parameters (for example, earthquake magnitude and depth). | Value of a physical index related to the event (for example, windspeed, millimeters of rainfall, earthquake magnitude or peak ground acceleration (PGA), modelled losses, and so on). |
| **Claim process** | Loss adjusters estimate damages through the inspection of the assets, which can be complicated. | A calculation agent has an agreement with insurance companies and reports on the estimated damage of the industry. | Parameters from the event are entered into the CAT model algorithm to estimate losses. | Transparent based on rules agreed in the contract (no loss adjustment is required). |
| **Speed of payout** | Can be slow. | Can be slow. | Quick payout (once the parameters of the events are available). | |
| **Use of Payout** | Intended for asset replacement (recovery and reconstruction). | Can be targeted to emergency relief or asset replacement. | Usually targeted to emergency relief, but no restrictions on use. | |
| **Basis Risk** | No risk, as payout is based on incurred losses. | Reduced basis risk, as the incurred loss from the industry is the trigger. | Moderate to high, depending on the CAT model. | High, as the index might not be well correlated to actual losses. |

# Introduction to Catastrophe Bonds & the World Bank's Capital At Risk Notes Program

**Naomi Cooney**
Senior Financial Officer,
Market Solutions & Structured Finance,
World Bank Treasury

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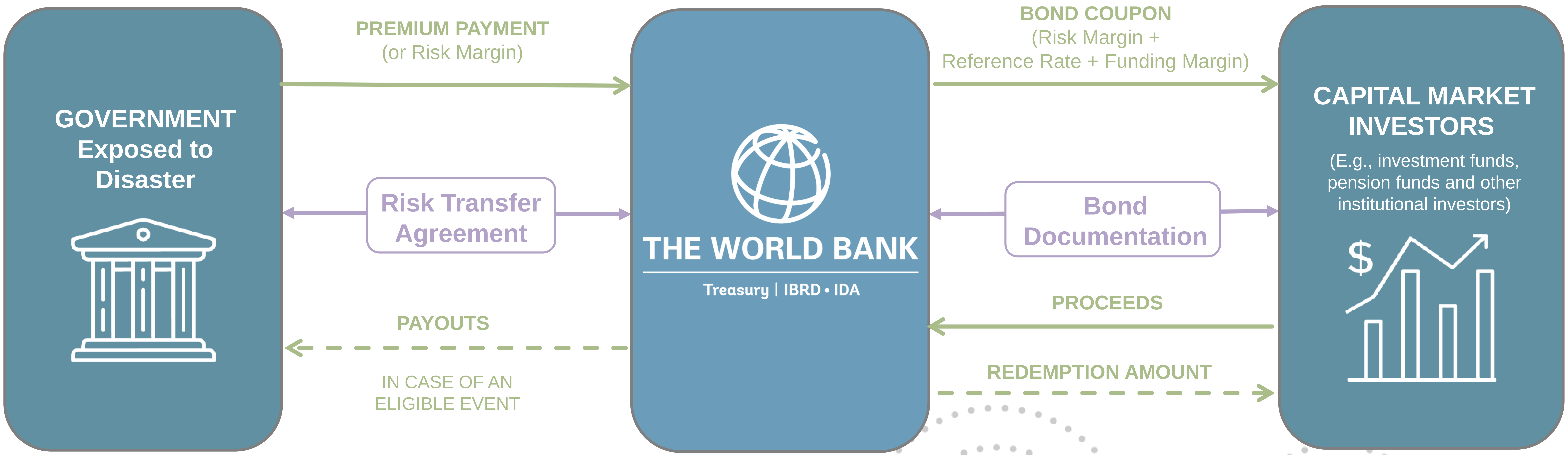
# What is a Catastrophe (CAT) Bond?

- A financial instrument that transfers catastrophe risks from a sponsoring entity to bond investors
- Similar to insurance, sponsors receive a payout when a disaster event meets certain pre-defined criteria, with no obligation to repay the payout
- A fully funded transaction where investors stand to lose some or all of the principal
- Risk coverage period is typically one to five years
- Can provide quick payouts when designed with parametric triggers
- Is not a debt obligation for the sponsoring entity (since they do not issue the bond)

# World Bank Catastrophe Bond Structure



# Catastrophe Bonds for World Bank Members

## US$3.6 billion in Catastrophe Bond Transactions

| World Bank Member | Year | Peril | Amount (USD million) |
|---|---|---|---|
| **Caribbean Catastrophe Risk Insurance Facility** | 2014 | Earthquake & Tropical Cyclone | **30** |
| **Mexico*** | 2009, 2012, 2017, 2020 | Earthquake & Hurricane | **1,450** |
| **Global** | 2017 | Pandemic | **320** |
| **Pacific Alliance: Chile, Colombia, Mexico, and Peru** | 2018 | Earthquake | **1,360** |
| **The Philippines** | 2019 | Earthquake & Tropical Cyclone | **225** |
| **Jamaica** | 2021 | Hurricane | **185** |

* The World Bank was the arranger of the cat bonds for Mexico in 2009 and 2012
For detailed case studies on these transactions go to www.worldbank.org/disasterriskinsurance

# Benefits of World Bank Intermediation

Makes risk bearing capacity of the reinsurance and capital markets accessible

Coordination of transaction process

Procurement of external agents

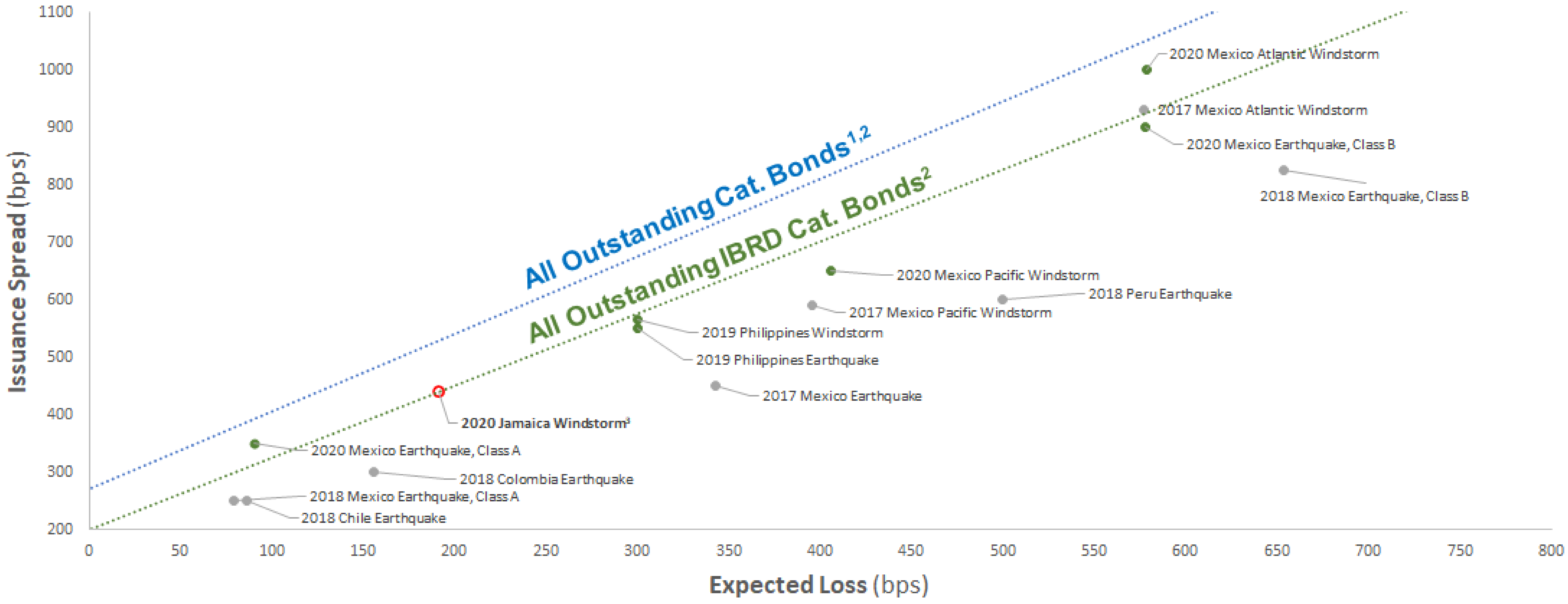
High investor demand

Competitive pricing

Proceeds from CAT bonds issued by the World Bank support the financing of projects that promote sustainable development goals around the globe.

# World Bank Catastrophe Bonds Price Favorably

## Bond Spreads at Issuance vs. Expected Loss




Source: Swiss Re Capital Markets

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1. All outstanding issuance includes all classes of non-life catastrophe bond notes with an actual maturity date beyond August 6, 2021
2. For transactions with Atlantic Tropical Cyclone risk, the expected loss associated with the AIR Warm Sea Surface Temperature Catalog ("sensitivity view") was used
3. Annualized expected loss of the transaction

# Development of Catastrophe Bonds for Sovereign Disaster Risk Transfer

## Colombia


**Alejandra Barragan**
Coordinator, Comprehensive Risk Management Group, Ministry of Finance, Colombia



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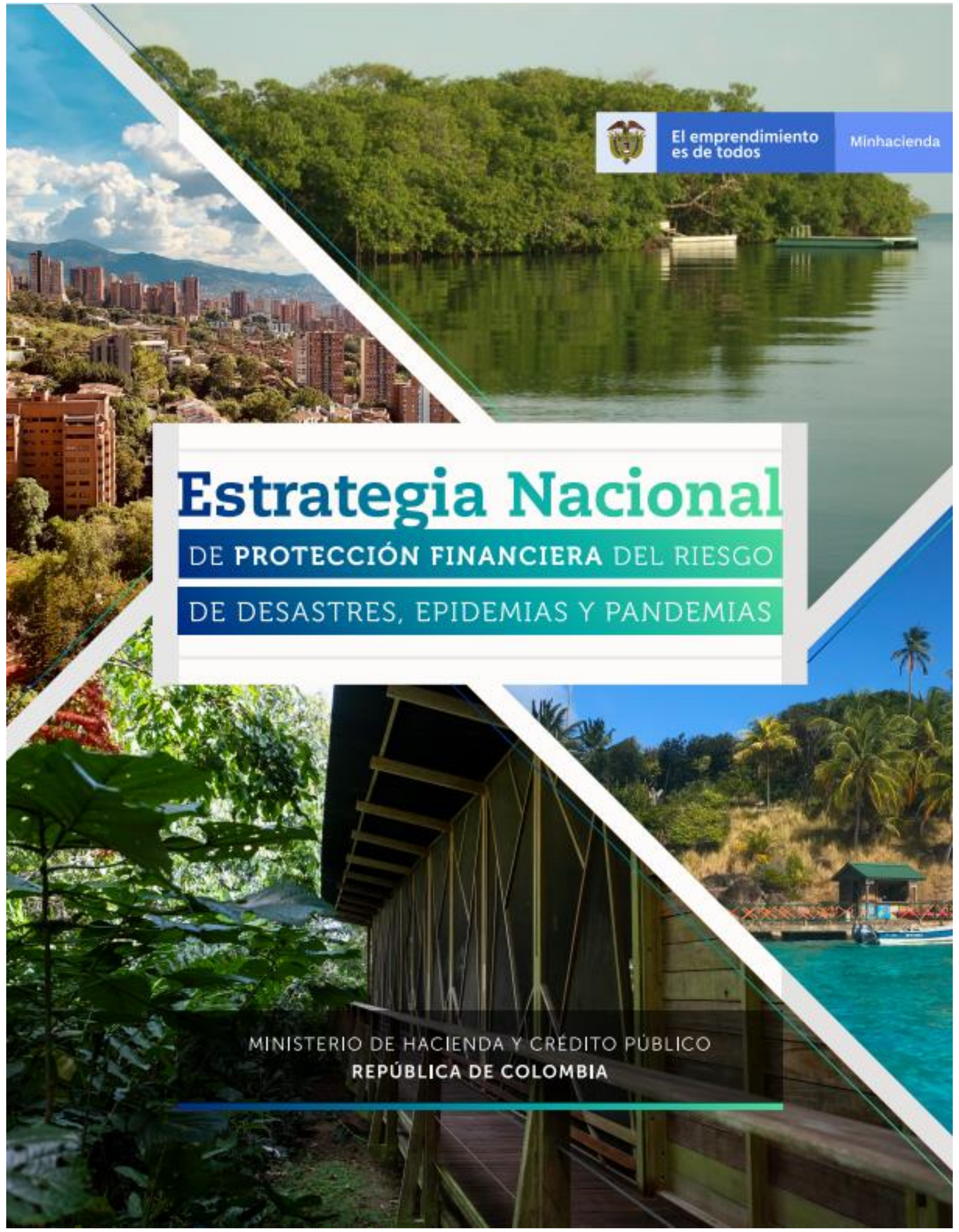
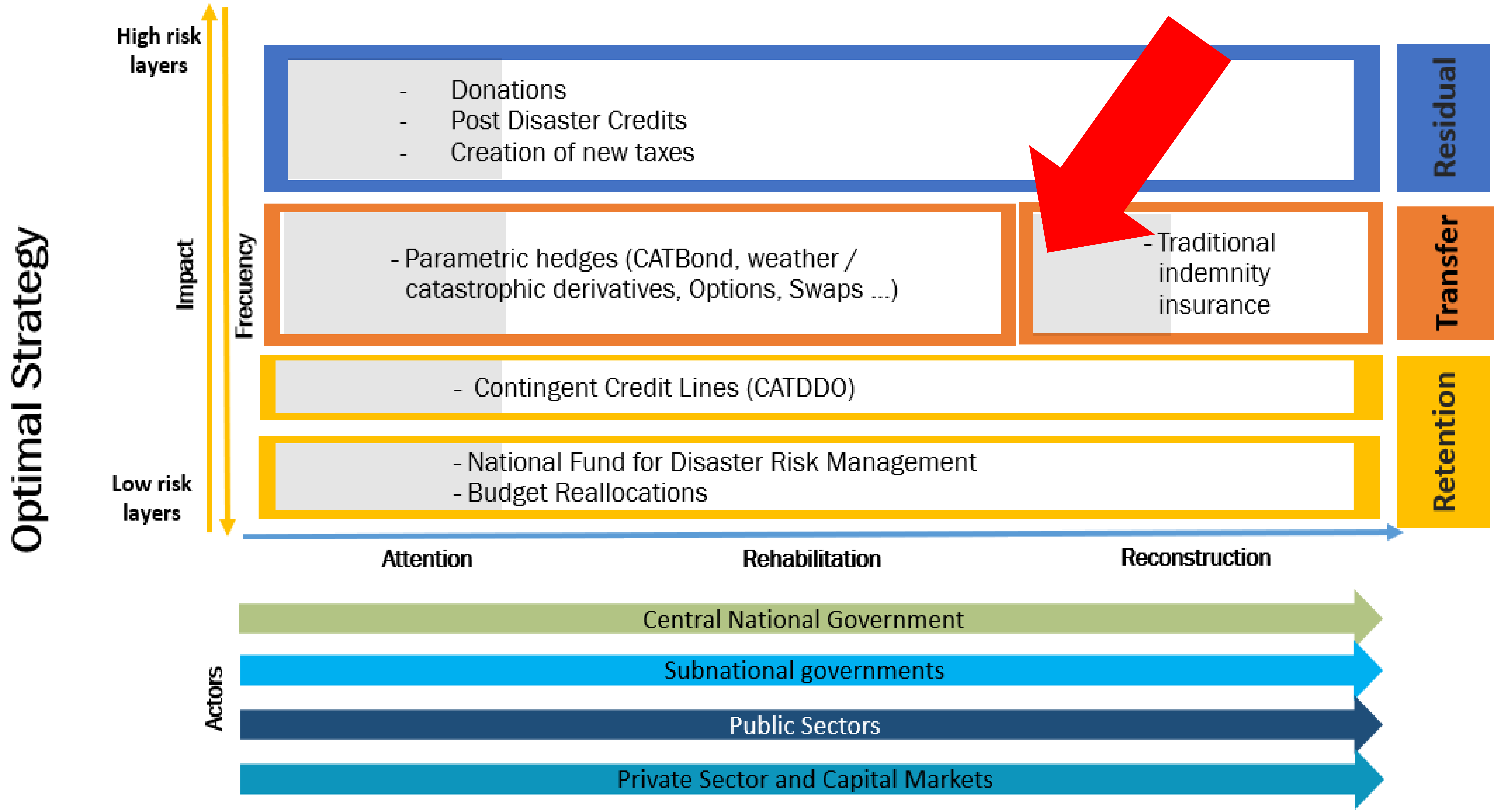
# National Strategy for Financial Protection against the risk of Disasters, Epidemics and Pandemics, Colombia 2021




**Policy Objectives**

- **01** **Identification and understanding of fiscal risk due to the occurrence of disasters**
- **02** **Financial management of disaster risk** (Financial Instrumentalization)
- **03** **Catastrophic risk insurance of public assets**
- **04** **Articulation with public sectors and the private sector**
- **05** **Strengthening of financial management in territorial entities**

# Risk layered Financial Strategy

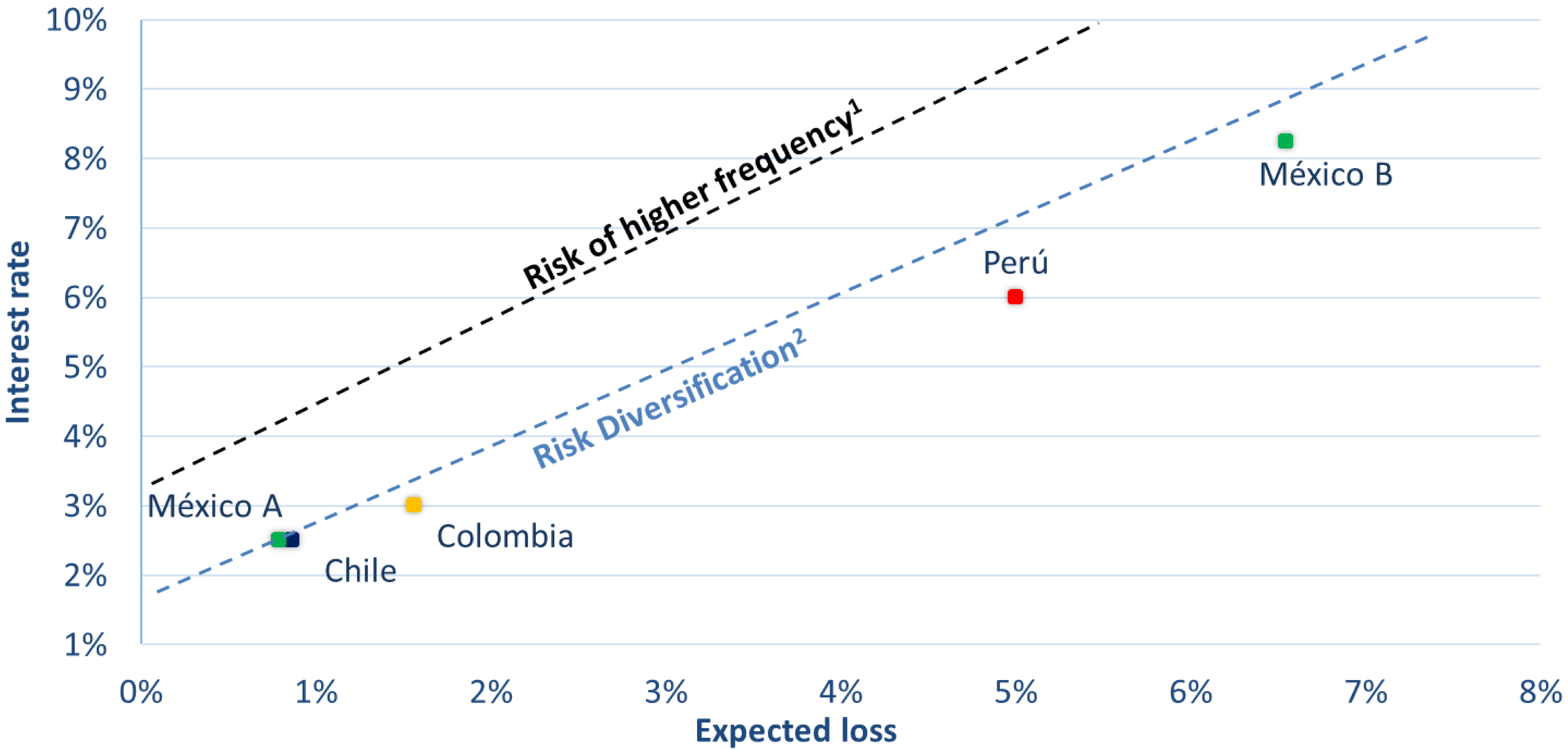


# CAT Bond - Pacific Alliance

Alianza del Pacífico


| Results | Chile | Colombia | Peru | Mexico A | Mexico B |
|---|---|---|---|---|---|
| Value Issued US$ | 500 | 400 | 200 | 160 | 100 |
| Term of Coverage | 3 years | 3 years | 3 years | 2 years | 2 years |
| Risk Premium | 2,50% | 3,00% | 6,00% | 2,50% | 8,25% |
| Expected Loss | 0,86% | 1,56% | 5,00% | 0,79% | 6,54% |
| Multiples | 2,91 | 1,92 | 1,20 | 3,16 | 1,26 |

# CAT Bond issuance valuation

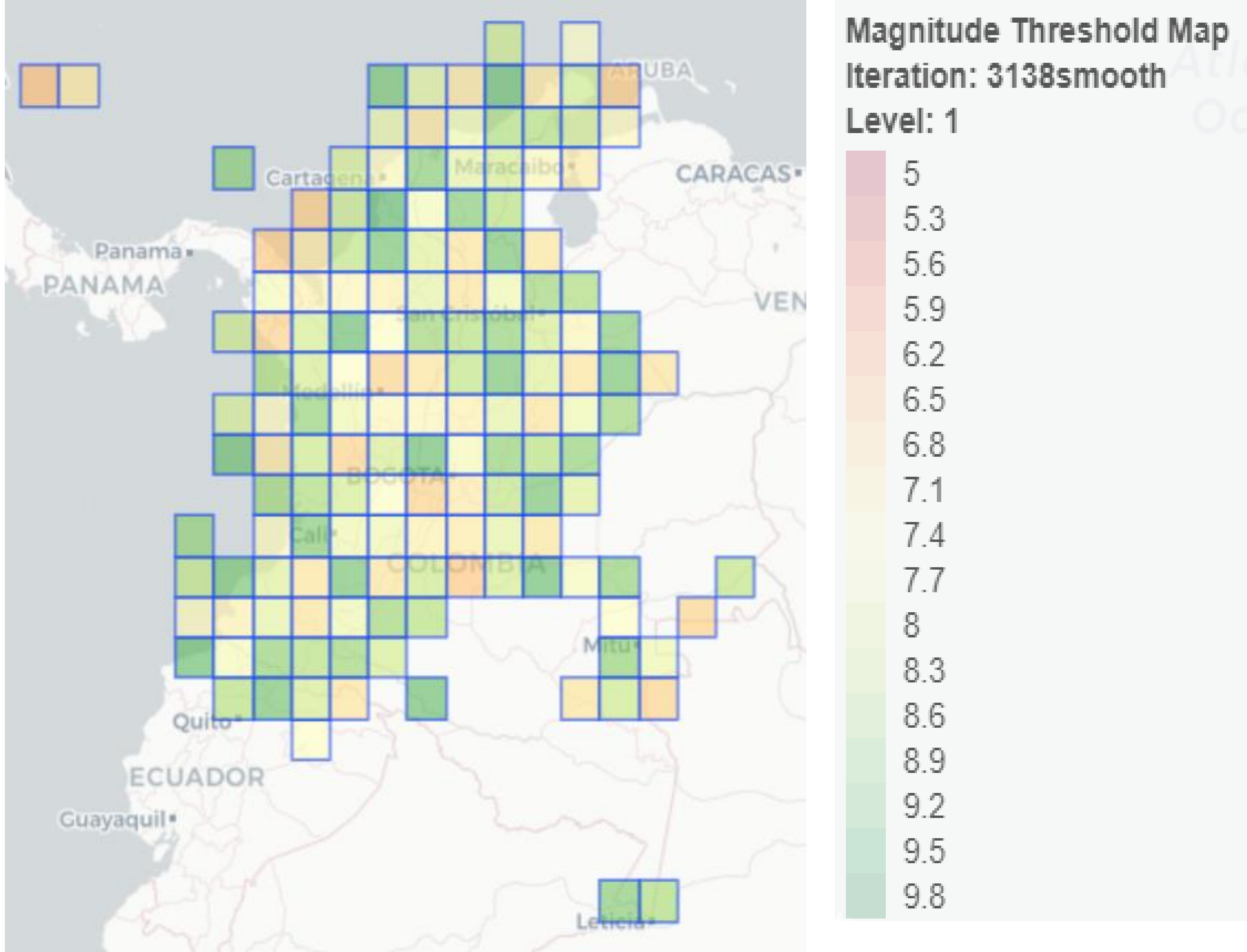



**1 Risk of higher frequency.** Hurricane transactions in the US (Excludes regional transactions, transactions with a maturity of less than 1 year, and transactions affected by recent catastrophes.

**2.Diversification of Risk.** Transactions outside the US (Excluding transactions with a maturity of less than 1 year)

**Source:** World Bank

# Results for Colombia




**TRIGGER**

- Moment Magnitude (Mw) assigned for each box.
- Associated with a latitude-longitude location

Magnitude of the earthquake ≥ Trigger magnitude
→ Payment activated

**COVERAGE**

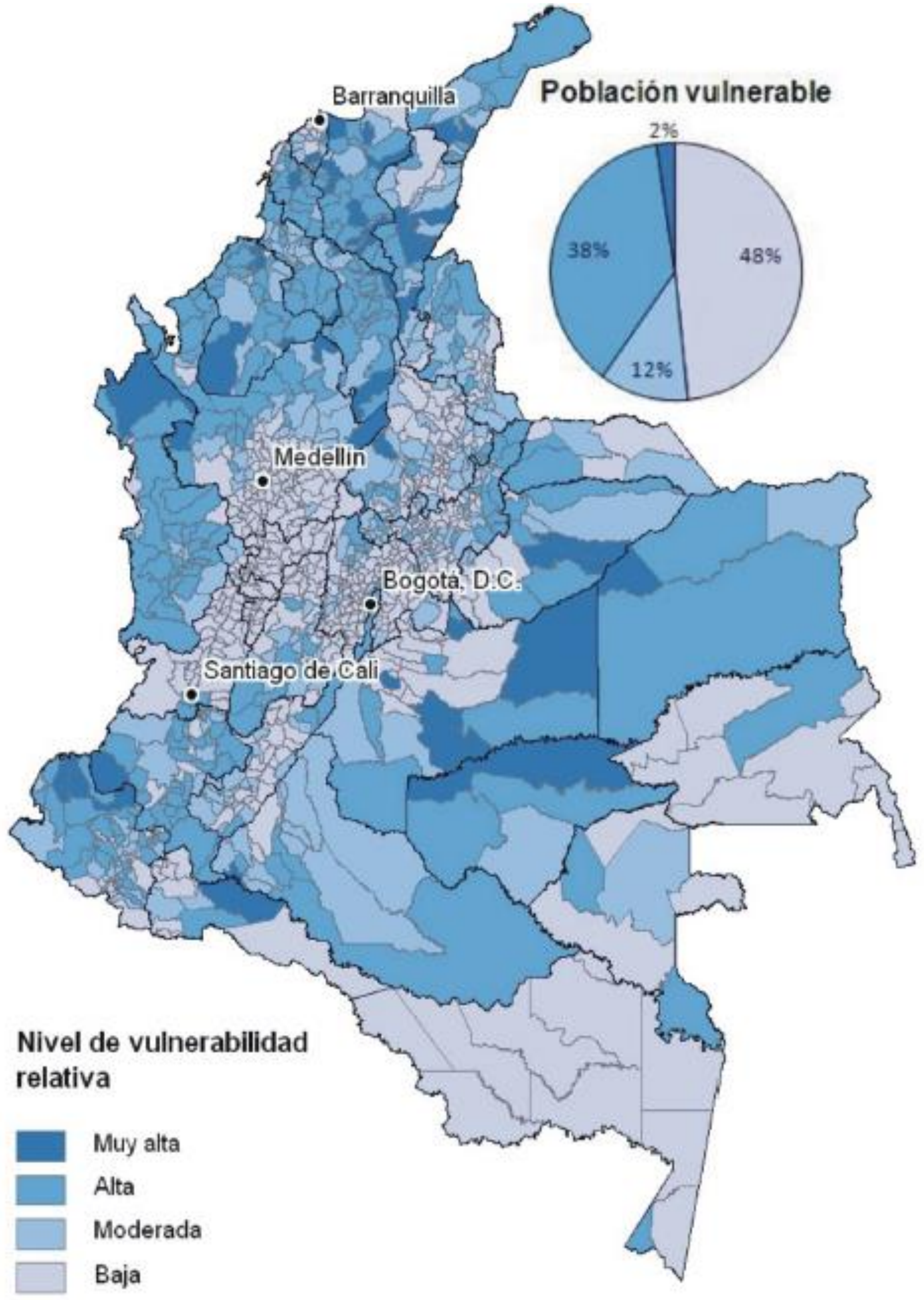
- Coverage in areas of high and medium seismic vulnerability
- Covers probable border events outside the national territory with effects within Colombia

**Benefits of issuing a CAT Bond within the Pacific Alliance**

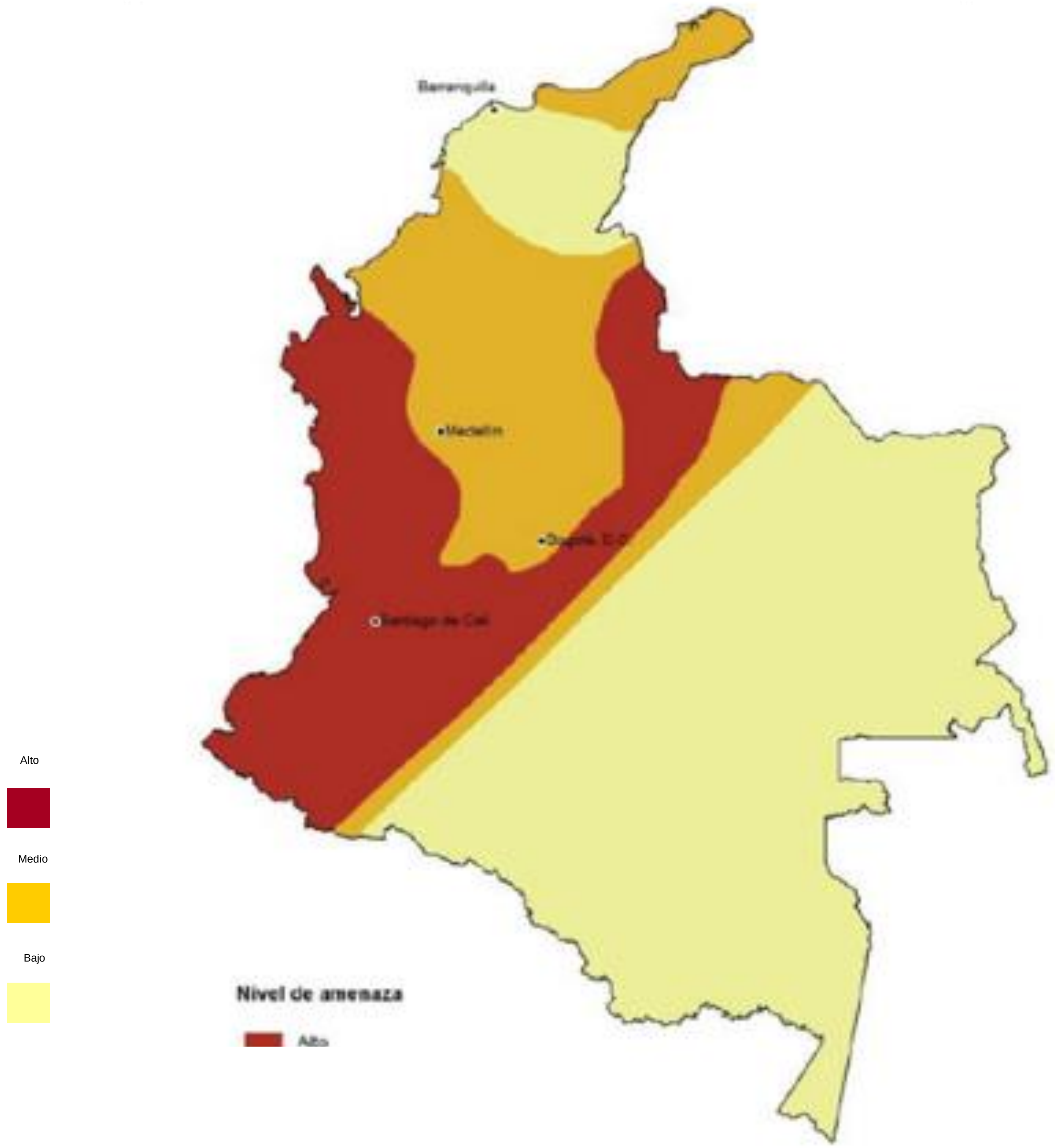
- ✓ Improved resilience
- ✓ Quick access to funds
- ✓ Optimize risk management
- ✓ Credit rating
- ✓ Reduction of the cost of coverage
- ✓ Practical Collaboration

# Next Steps

## Hydrometeorological




## Earthquakes

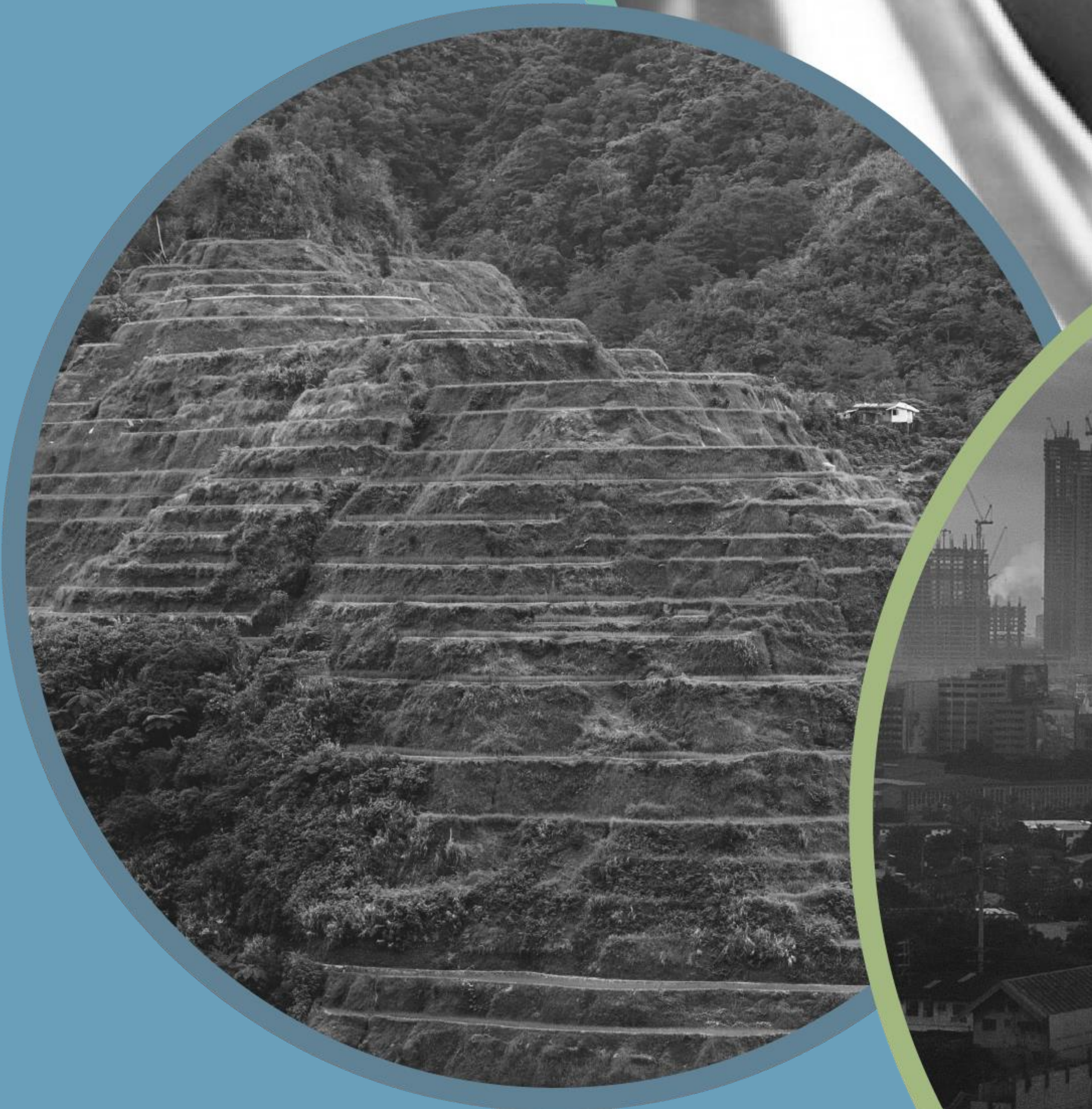



- **Territorial and sectoral FP strategies**

# CAT Bonds
# Philippine Experience

## The Philippines

**Eduardo Anthony G. Mariño III**
OIC-Deputy Treasurer, Bureau of the Treasury, Republic of the Philippines



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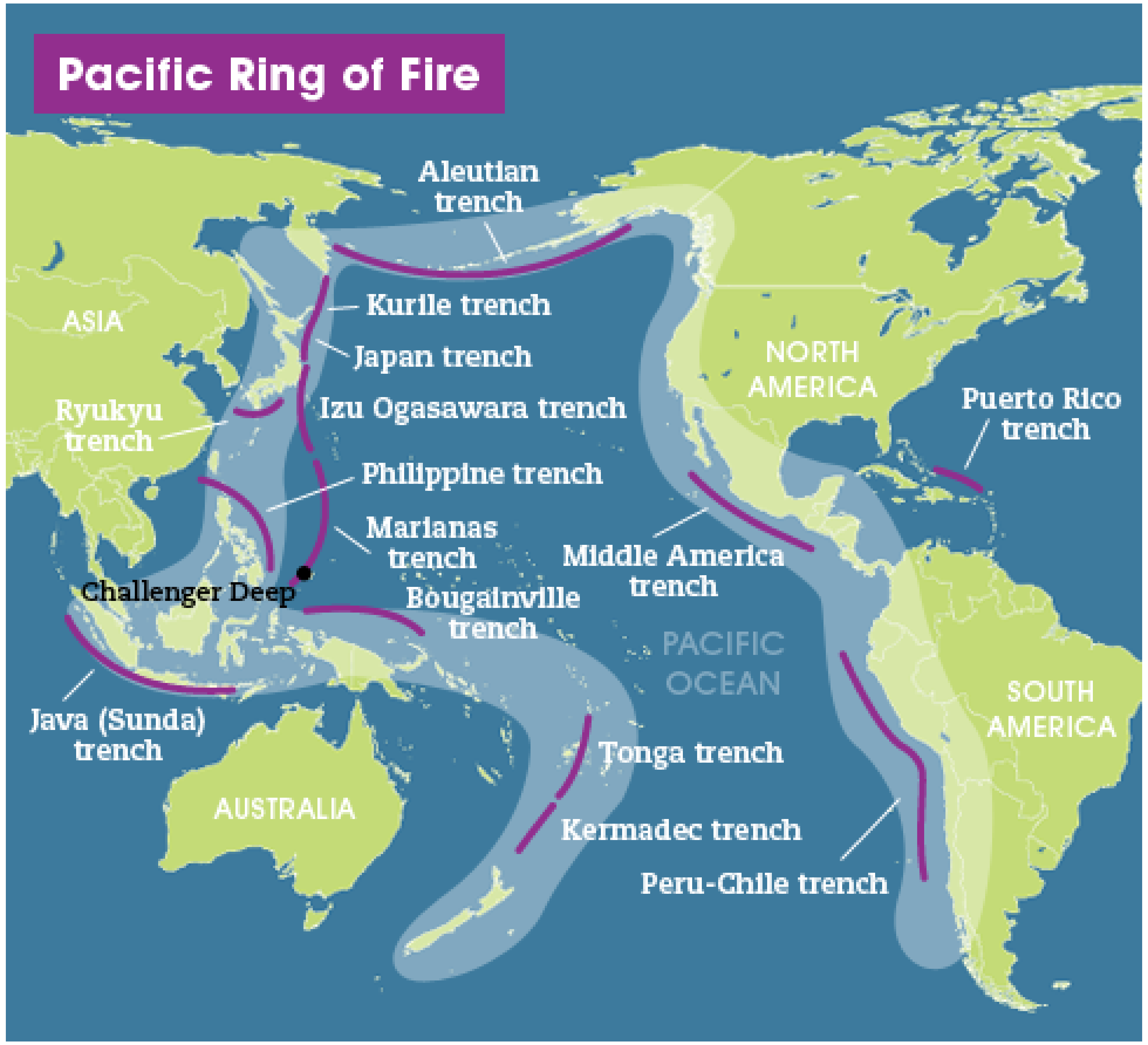
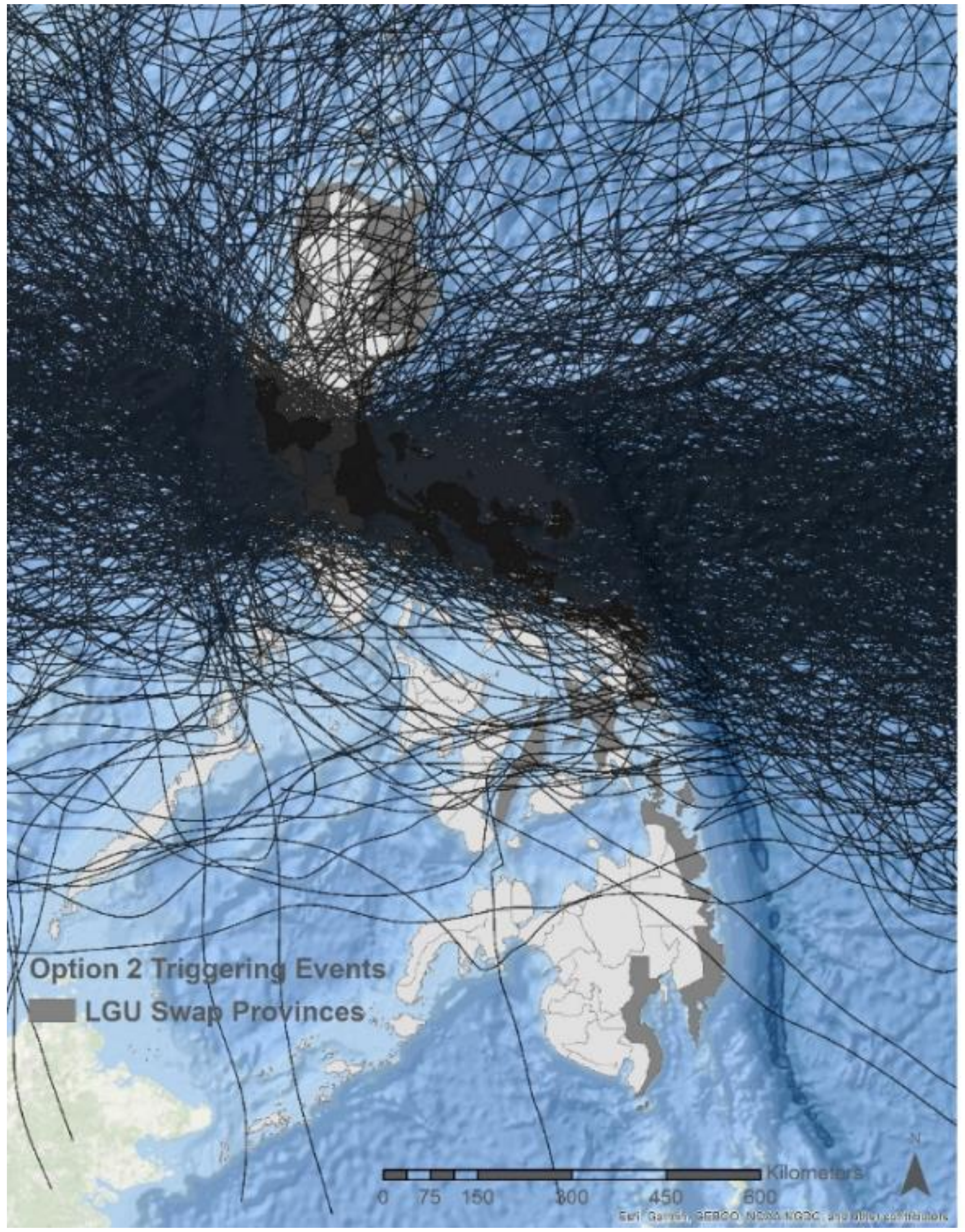
BUREAU OF THE TREASURY 1897

# The Philippines: A Disaster Prone Nation




1. Located along the Pacific Ring of Fire;
2. The Philippines accounts for 25% of the disasters reported in the ASEAN region annually;

1. Ranks 4th in the world among countries hit by the highest number of disasters over the past 20 years; and
2. Averages more than 20 typhoons per year

# Disaster Risk Finance and Insurance: Strategic Policy Goals

## National Level

To maintain sound fiscal health at the national government level, necessary to support long term rehabilitation and reconstruction needs;

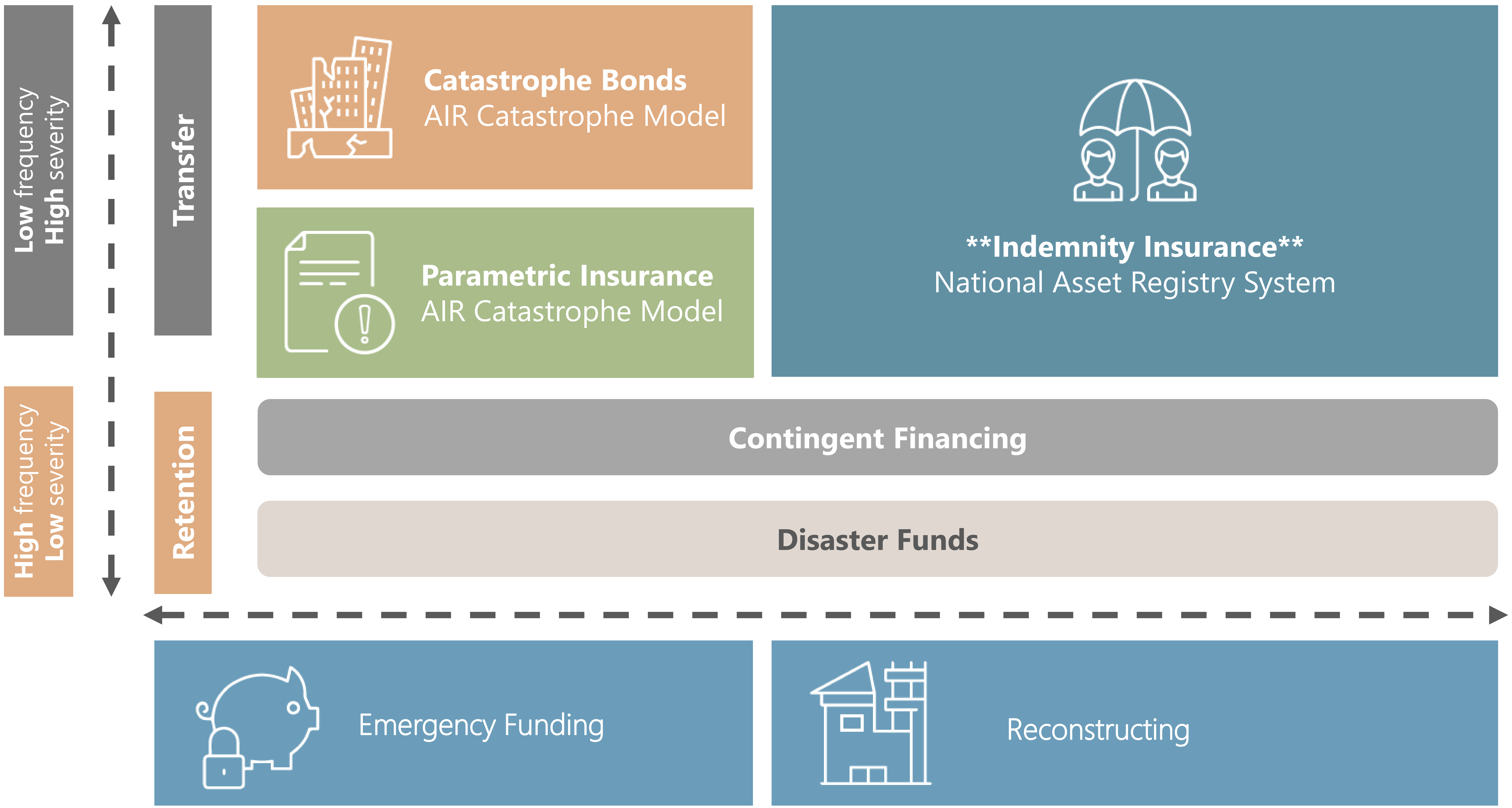
## Local Level

To develop sustainable financing mechanisms for local government units, necessary to provide immediate liquidity at the onset of a disaster; and

## Individual Level

To reduce the impact on the poorest and most vulnerable and prevent them from falling into a cycle of poverty, while also shielding the near-poor from slipping back into poverty.

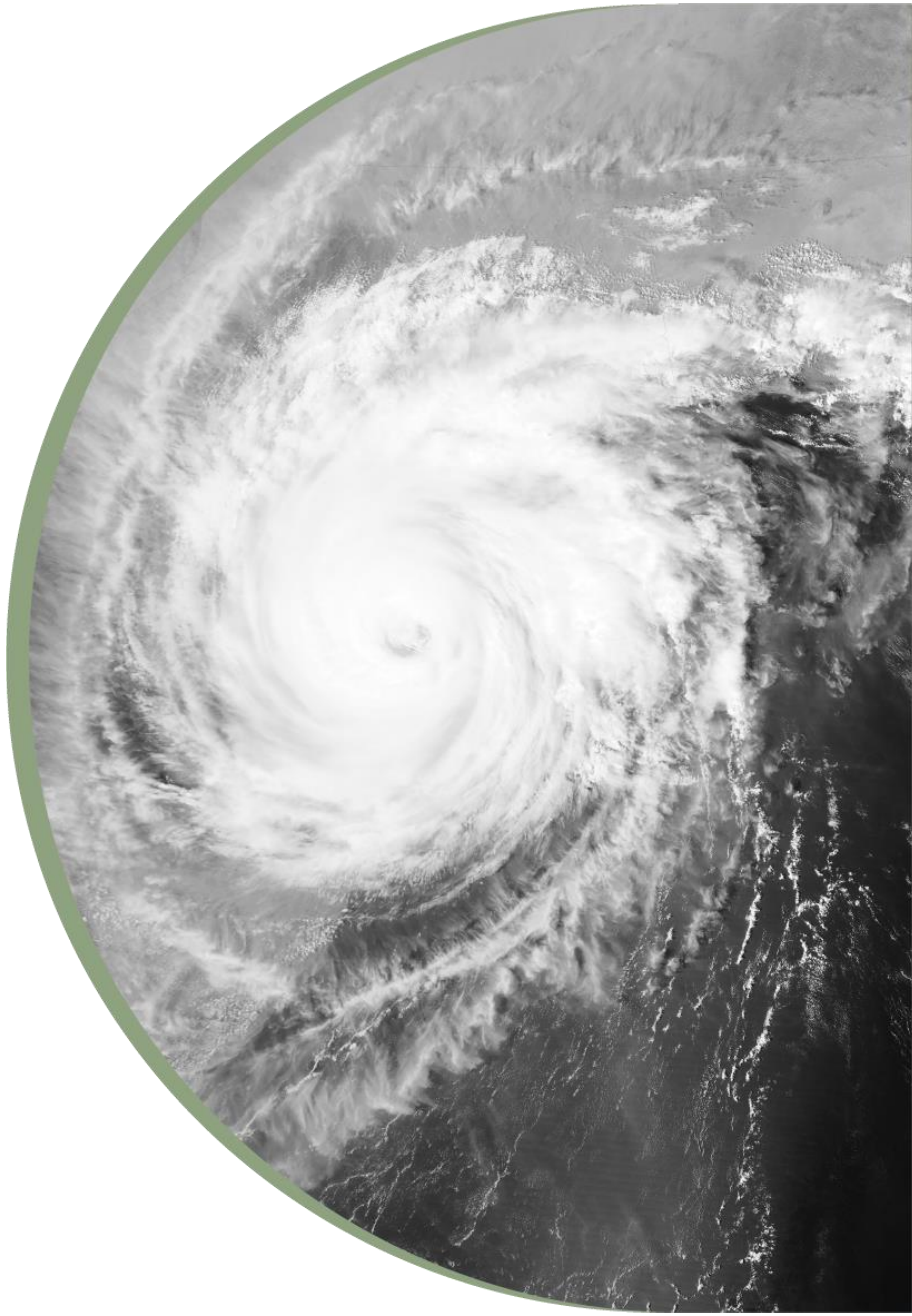
# Risk Layering




**Rationale:** Retaining all risks would divert funds from key government programs, while transferring all risks would be too costly for government.

# ROP CAT Bond Terms

| | |
|---|---|
| **Covered Area** | Nationwide |
| **Beneficiary** | National Government |
| **Use of Proceeds** | Budget Support |
| **Perils Covered** | Typhoon, Earthquake |
| **Maximum Coverage** | USD 300 Million (USD 200 M for typhoon; USD 100 M for earthquake) |
| **Period Covered** | 3 Years |
| **Trigger and Payout Structure** | 3-Step<br>35% Payout: 1-in-19 Years<br>70% Payout: 1-in-40 Years<br>100% Payout: 1-in-100 Years |
| **Transactions Involved** | Swap Contract (Derivative)<br>Bond Issuance |
| **Risk Taker** | Investors |
| **Facility** | World Bank Capital-At-Risk Notes Facility |



# Q&A

- **Please share your questions <u>in English</u> via chat box.**
- **If possible, please indicate which speaker(s) to address your question(s).**

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# Next Webinar

| FACT SHEET 1-2 | | FACT SHEET 3-5 | | |
|---|---|---|---|---|
| 01 | 02 | 03 | 04 | 05 |
| Managing Disaster-Related Contingent Liabilities | Fiscal and Financial Resilience for Sub-national Governments | Disaster Reserve Funds | Sovereign Disaster Risk Insurance | Development of Catastrophe Bonds for Sovereign Disaster Risk Transfer |

| FACT SHEET 6 | FACT SHEET 7-8 | |
|---|---|---|
| **Catastrophe Risk Insurance Market Development** | Data and Information for Sovereign Disaster Risk Financing | Disaster Risk Financing Analytics Training |
| 06 | 07 | 08 |

# Thank you

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