Role of Earthquake Insurance in Earthquake Risk and Resilience Building:

International Workshop on Advances in Assessment and Modelling of Earthquake Loss

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15 Years

EMI

Earthquakes and Megacities Initiative

Building Urban Resilience

A member of the U.N. Global Platform for Disaster Risk Reduction since 2005

Special Consultative Status with the U.N. Economic and Social Council since 201

Outline

1. What is resilience?

2. How does insurance intervene in resilience?

3. Why does insurance matter in building resilience?

4. The new dynamic in cat risk financing
5. More innovation in the market
    - Improving the development of exposure databases
    - PCDIP (Philippines City Disaster Insurance Pool)

6. Concluding thoughts

About EMI

EMI is an international, scientific organization which **started in 1998**, and was established as a not-for-profit organization in the Philippines in 2003.

EMI has over **20 years experience** in the disaster risk management and urban resilience practice globally.

Member of the UN Global Platform for Disaster Risk Reduction

Conferred Special Consultative Status with the UN Economic and Social Council

Member of the Steering Committee of the UNISDR Making Cities Resilient Campaign

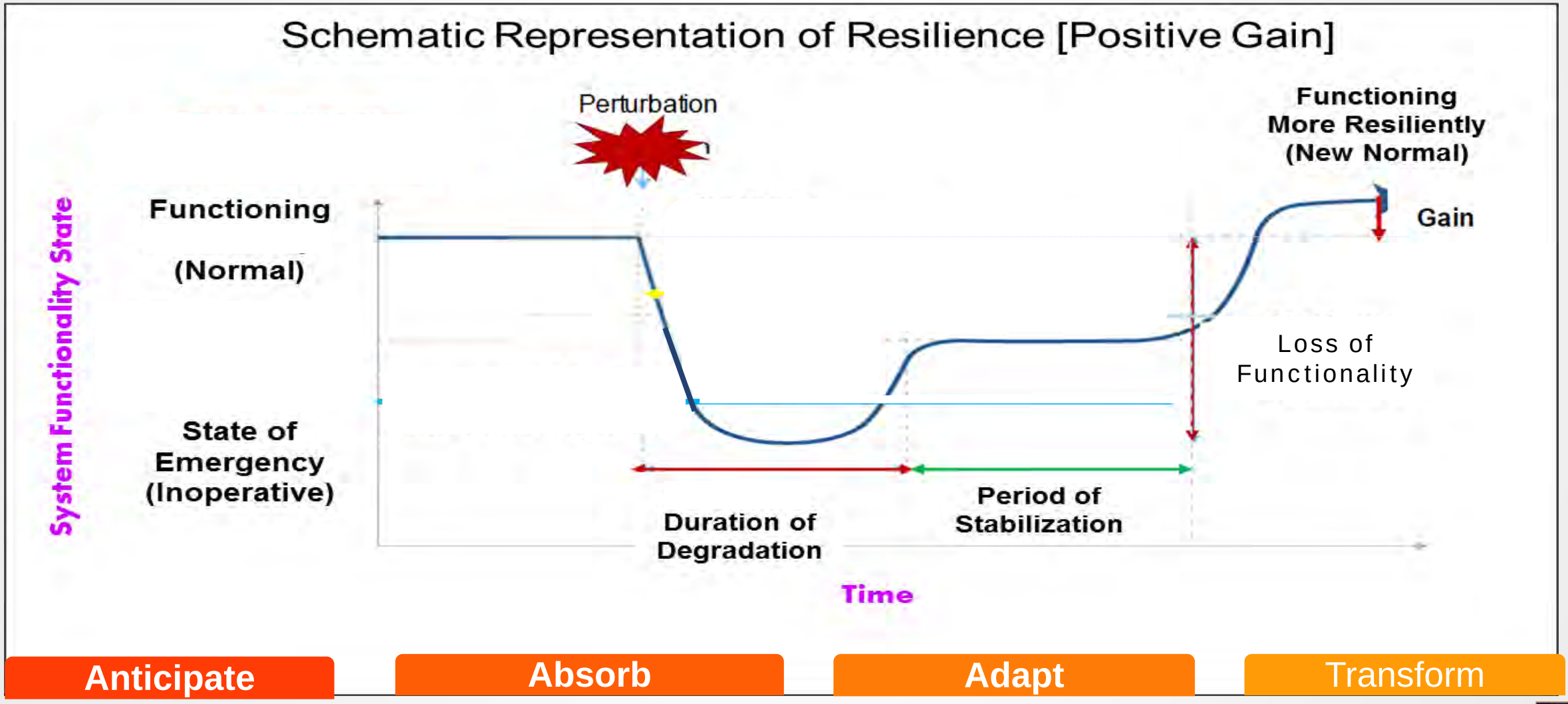
Definition(s) of Resilience

The simplest but complete definition of resilience from the National Academies of the USA:

*"The ability to **prepare** and plan for, **absorb**, recover from and more successfully **adapt** to adverse events"*

What is Resilience

Resilience Seen as a Risk Tolerant System



We use System theory to study the resilience of urban systems

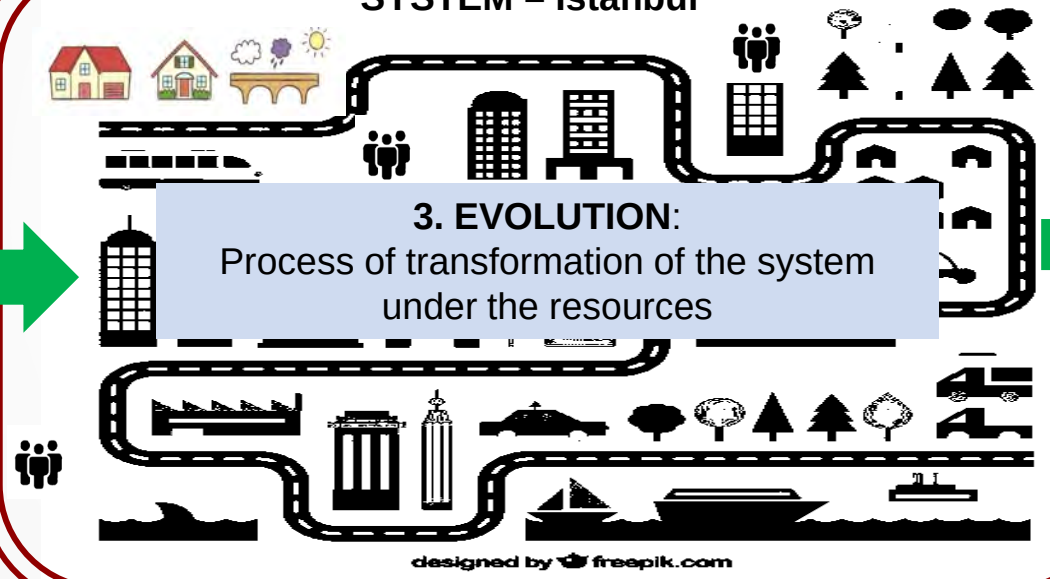
1. ENVIRONMENT :
All the elements inside and outside the system that have the potential to affect part of all the system including **shocks and stresses**. Etc.

SYSTEM – Istanbul

2. INPUT:
All resources
(external or internal)

Insurance ?

3. EVOLUTION:
Process of transformation of the system under the resources



4. OUTPUT:
Work of the system to the environment

5. FEEDBACK :
The learning process that makes the system improve

Figure 1. Resilience finds its theoretical basis in system theory

My System is resilient if each of each element in its system is resilient. However some systems are more critical than others.

How does insurance intervene in resilience?

1. Cash infusion in the economic system which will enable restoring property and livelihoods
2. Financing “residual” risk
3. Reduce the impact of stresses (i.e., extensive risks)
4. Builds confidence in the economic system

Insurance contribution to resilience

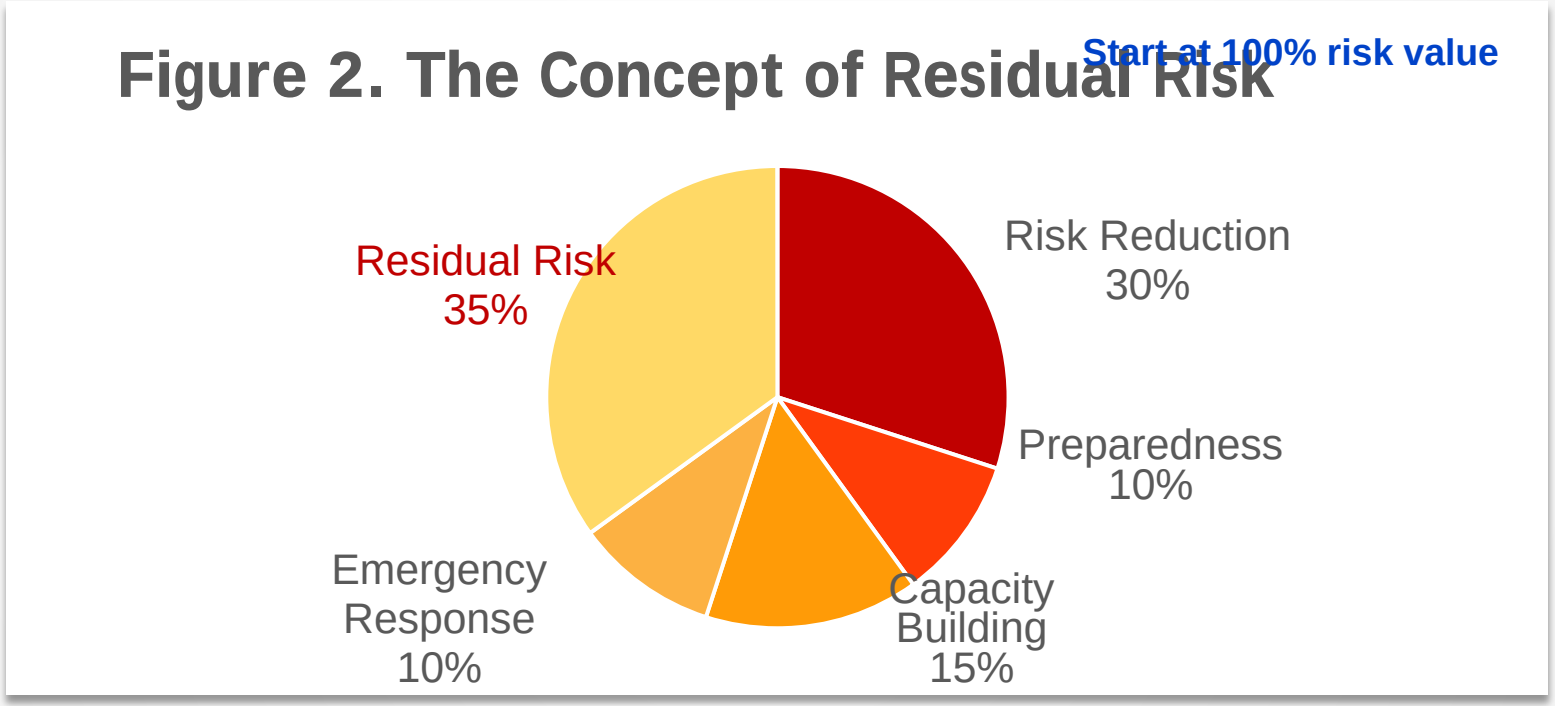
1 Restore property and livelihoods after an earthquake

- The big advantage of insurance as a resource is that it is an **immediate cash infusion**. In fact, the faster the insurance funds are put back into the system, the more resilience the system has.
- The cash is used to restore property and avoid interruption of commercial and industrial activity.
- It is essentially a resource to the resilience system that can be put immediately at use.

Insurance contribution to resilience

2

Financing “residual” risk



This is an important factor of resilience offering government, communities, businesses, and households the possibility to rebuild from their losses and restore livelihoods and economic activity.

Insurance contribution to resilience

3

Reduce the impact of stresses (i.e., extensive risks)

It does that enabling a process of maintaining functionality of a system by providing funds for recovery under minor but more frequent events.

- Poor air quality
- Energy insecurity/ power outage
- Climate Change
- Drought/ Water scarcity
- Environmental degradation
- Etc…

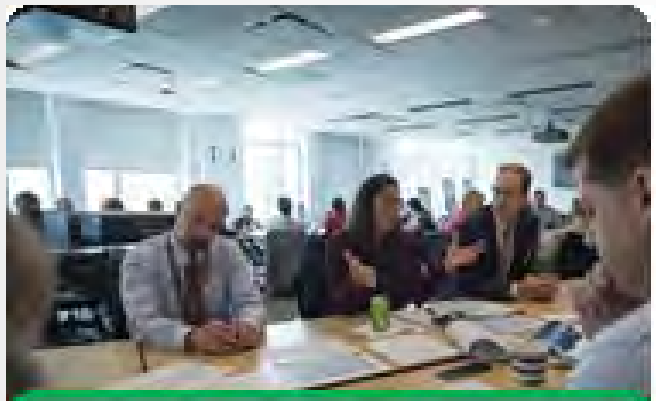
Insurance contribution to resilience

4

Builds confidence in the economic system

- Insurance could be a contributor in awareness raising about hazards and risks, and in building confidence in the viability of the system itself.

- There is **higher confidence** to provide investment in properties, businesses and industries that are insured.



Private Sector

Civil Society

Citizens

Why does insurance matter in building resilience?

For most countries, governments have been the insurer of last resort when it comes to cat risk


Construction codes provide “earthquake-proof” structures!

The level of cat insurance penetration in many countries is very low.

The ultimate government intervention coupled with the lack of effectiveness of the financial transaction negate any incentive for individuals to acquire a cat insurance policy.

Why does insurance matter in building resilience?

Other elements are also at play in affecting the business case for cat insurance:

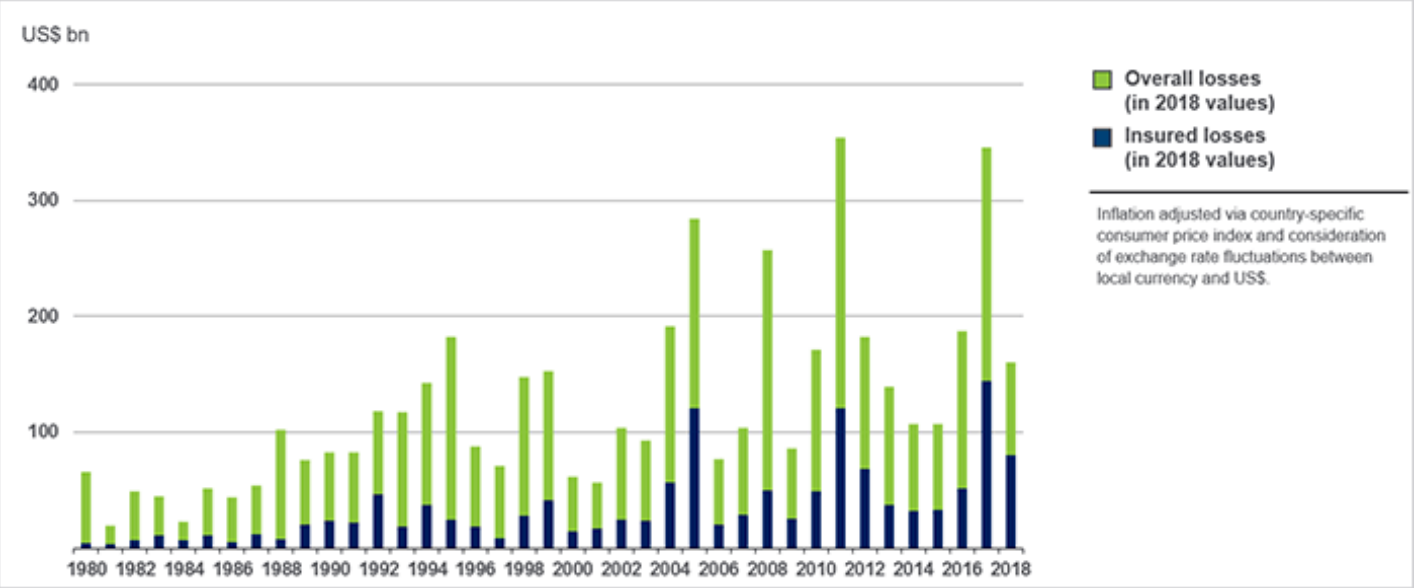
- Low frequency reduces the public awareness (i.e., it will not happen in my lifetime);
- I am fine because my property/business was not affected in the last event (i.e., it only happens to others);
- A general ‘chronic” understanding of cat insurance and cat risk among the general public; and
- Cost – for several individuals the cost of cat insurance was not affordable.

Construction codes provide “earthquake-proof” structures!

The new dynamic in cat risk financing

Successive catastrophic events causing devastating losses to society have raised the need for new approaches to provide financial protection from cat events.

Governments are finding it more and more costly to come after a disaster and pick up the bill. Governments are also realizing that "physical protection" through infrastructure is not necessary full protection.



The new dynamic in cat risk financing

New phenomena are also taking place that caused the increase awareness:

Urbanization causing accumulation of assets in cities and urban agglomeration; Wealth accumulation has increased the value of assets;

Domino-effects caused by the complexity of the urban environment that can multiply the losses.

Climate change which affects severity (and arguably frequency) of events;

TCIP an early model experiment

TCIP is an early experiment aimed at increasing penetration by making cat insurance mandatory. The basic concept of insurance of spreading risk widely among as many property owners as possible is applied, thereby reducing premium cost and making insurance affordable

first “line of defense” for government to shift losses towards property owners and reduce its contingent liability.

TCIP struggled but has progressively built strength mostly through sound insurance practices, awareness raising, keeping affordability, and relying on scientific modeling.

- In 2016, TCIP has 136 billion Euro coverage capacity for earthquake losses in Turkey. A true evidence of resilience contribution to Istanbul, other major cities in Turkey and the country a

TCIP an early model experiment

BOTTOM LINE IN CONTRIBUTION TO RESILIENCE > > >

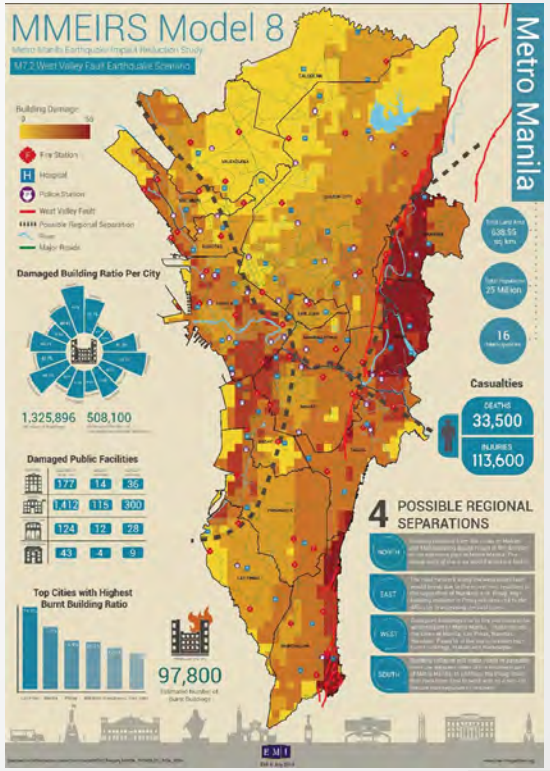
TCIP has 136 billion Euro (2016 figure) coverage capacity for earthquake losses in Turkey that it can put back into the economy immediately after an earthquake with essentially ZERO cost to the government.

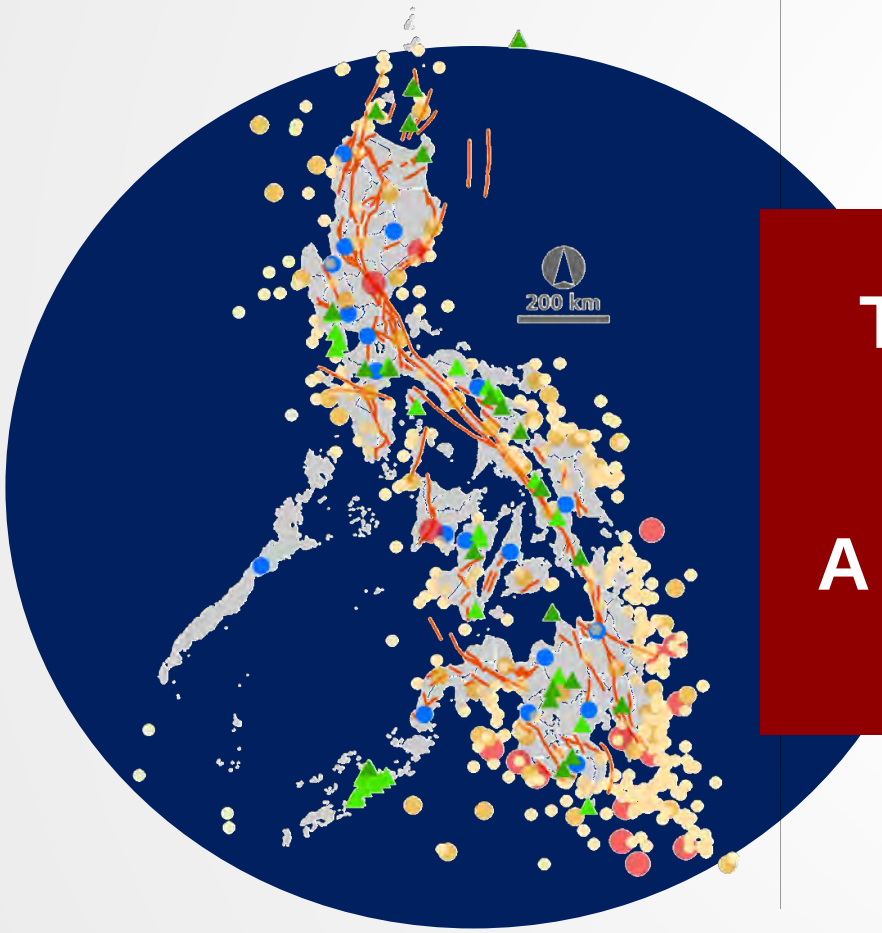
A true evidence of resilience contribution to Istanbul, other major cities in Turkey and the country.

More innovation in the market

Pushed by the IFIs, more risk transfer products have been coming into the market. Made possible by the sophistication of Cat Models.

- Cat models provided a means to anticipate future losses and to understand volatility thus resulting in more accurate pricing of risk and greater transaction efficiency and transparency).
- Cat models enabled new financial products directed towards the capital market.
- These latest advances have made insurance a greater factor in resilience building.



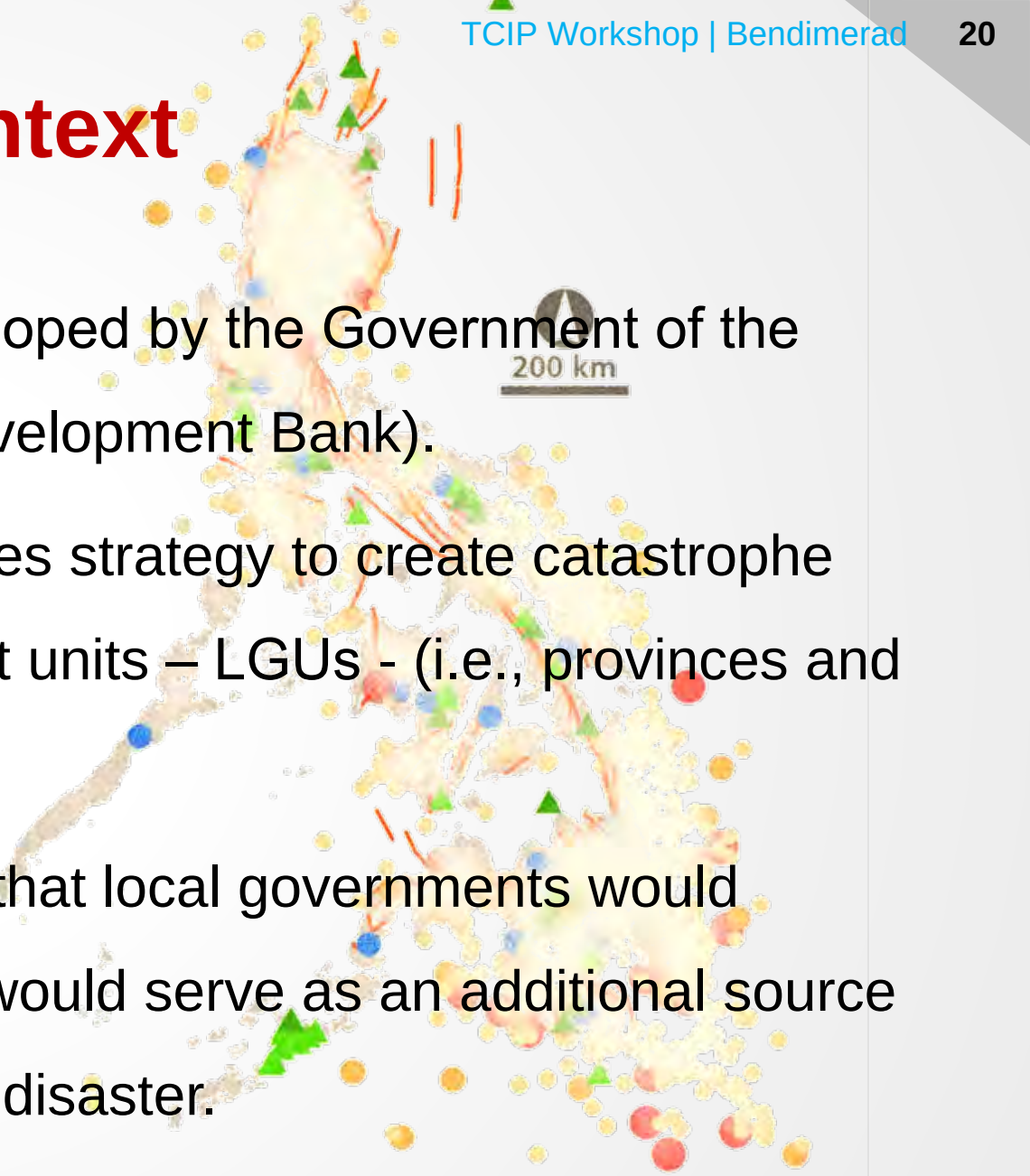


Example of Insurance Innovation

The Philippine City Disaster Insurance Pool (PCDIP):

A solution to enable immediate early recovery funding for cities in the Philippines

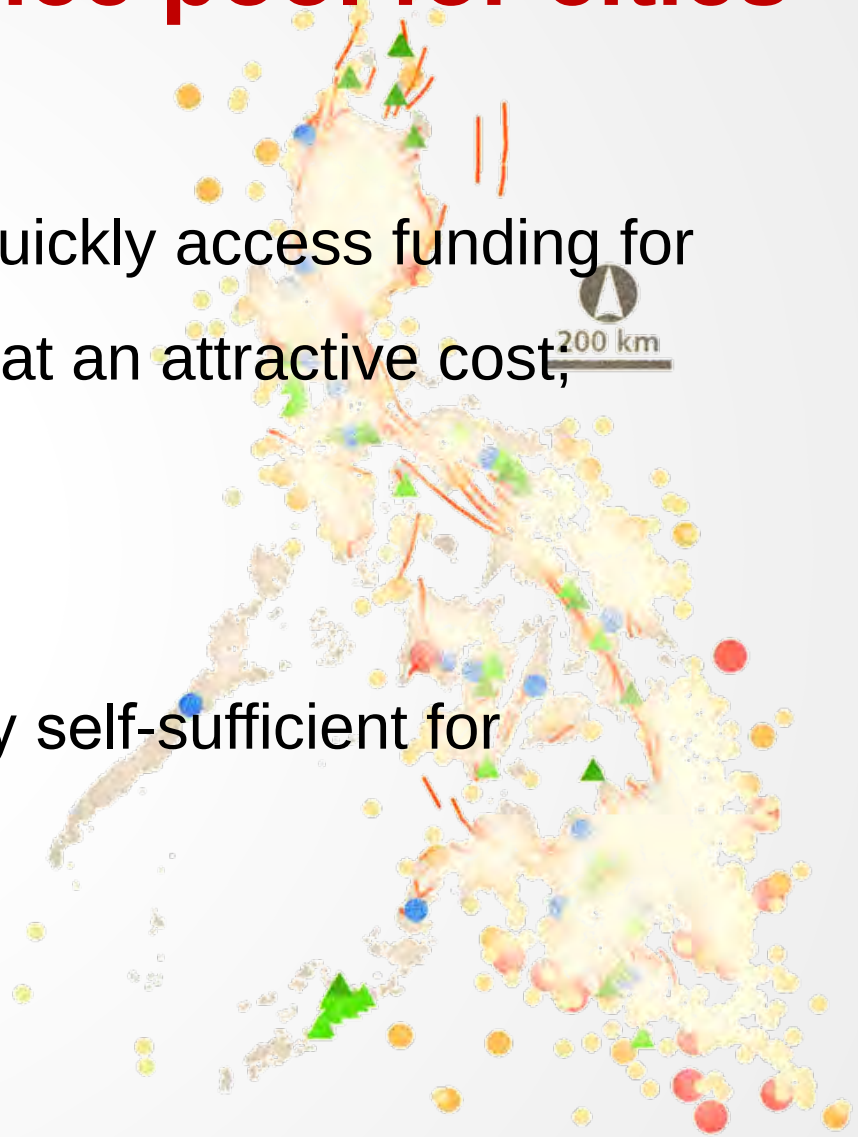
PCDIP Context



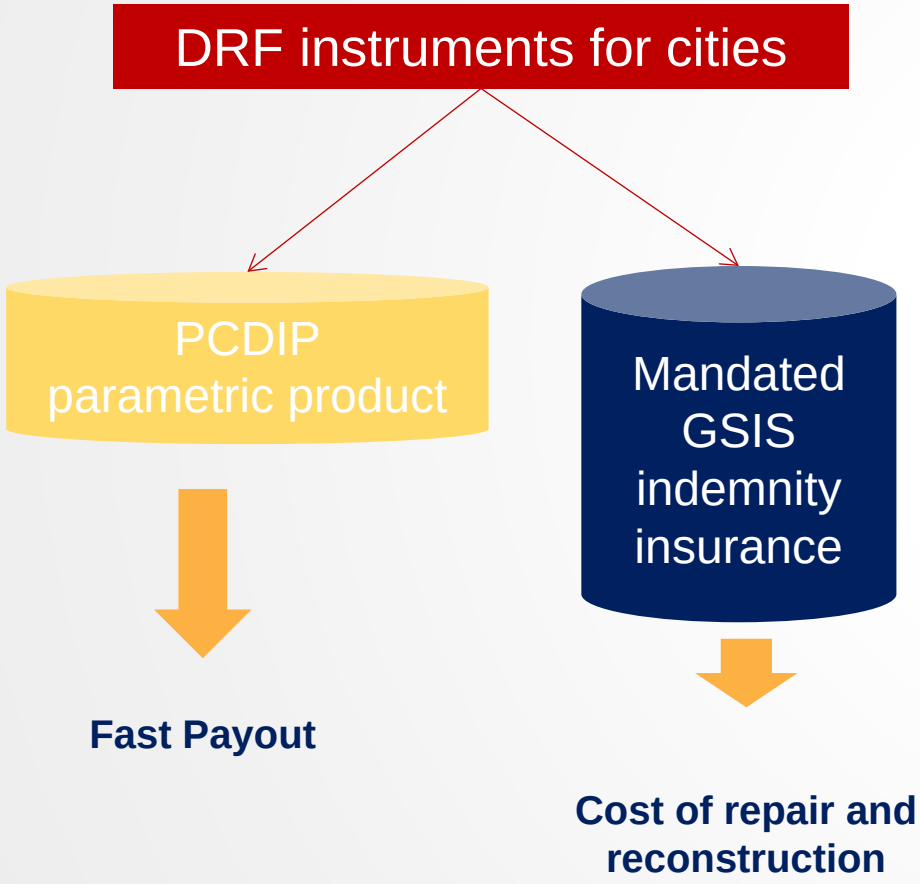
- A city disaster insurance pool is being developed by the Government of the Philippines (with support from the Asian Development Bank).
- It is core to the Government of the Philippines strategy to create catastrophe financial self-sufficiency of local government units – LGUs - (i.e., provinces and cities).
- Earlier studies and recent events indicated that local governments would benefit from a disaster insurance pool that would serve as an additional source of near-immediate liquidity in the event of a disaster.

Benefits of a disaster insurance pool for cities

- A disaster insurance pool would allow cities to quickly access funding for the relief and early recovery phases, potentially at an attractive cost;
- It would complement existing DRF instruments.
- It would enable cities to become more financially self-sufficient for disasters.

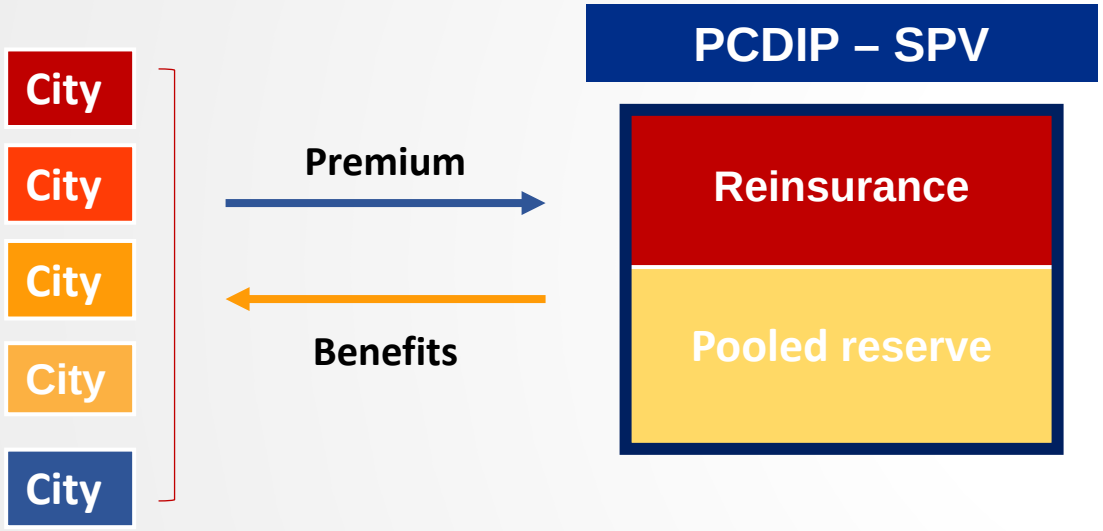


PCDIP: a solution for cities



- ✓ City government disaster insurance pool with a parametric trigger structure to provide immediate short-term liquidity to support early recovery – *first of its kind*
- ✓ Complements existing DRFI instruments, allowing the cities to become more financially prepared for disasters

PCDIP: a solution for cities



- ✓ Initially , covers two hazards:
  - ✓ Tropical cyclone (wind speed)
  - ✓ Earthquake (ground shaking)

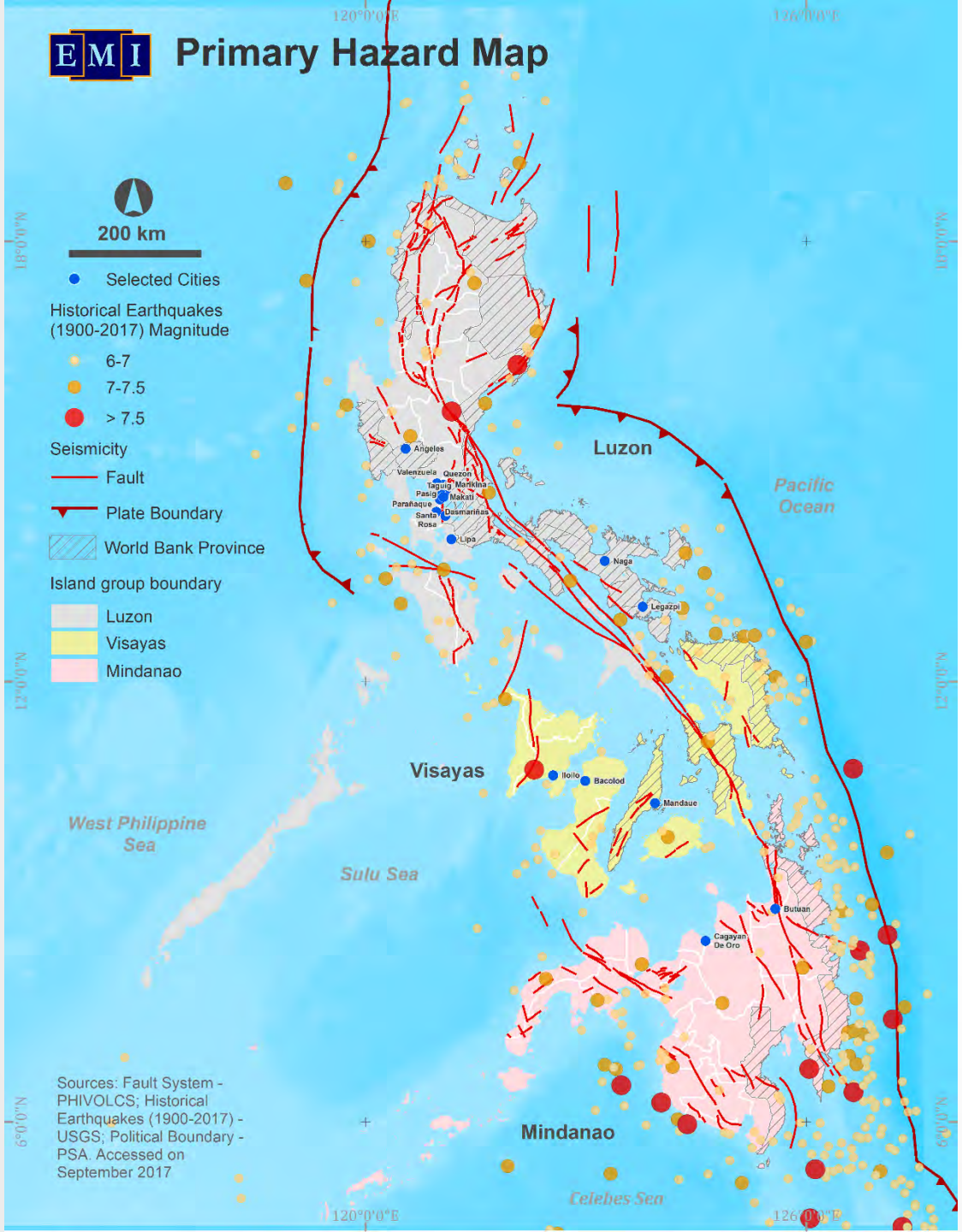
- ✓ For each hazard cities can chose:
  - ✓ The probability of events leading to minimum and maximum pay-outs
  - ✓ The required amounts of those minimum and maximum pay-outs
  - ✓ Cities can see how much cover a set level of premium would buy

Key benefits to cities

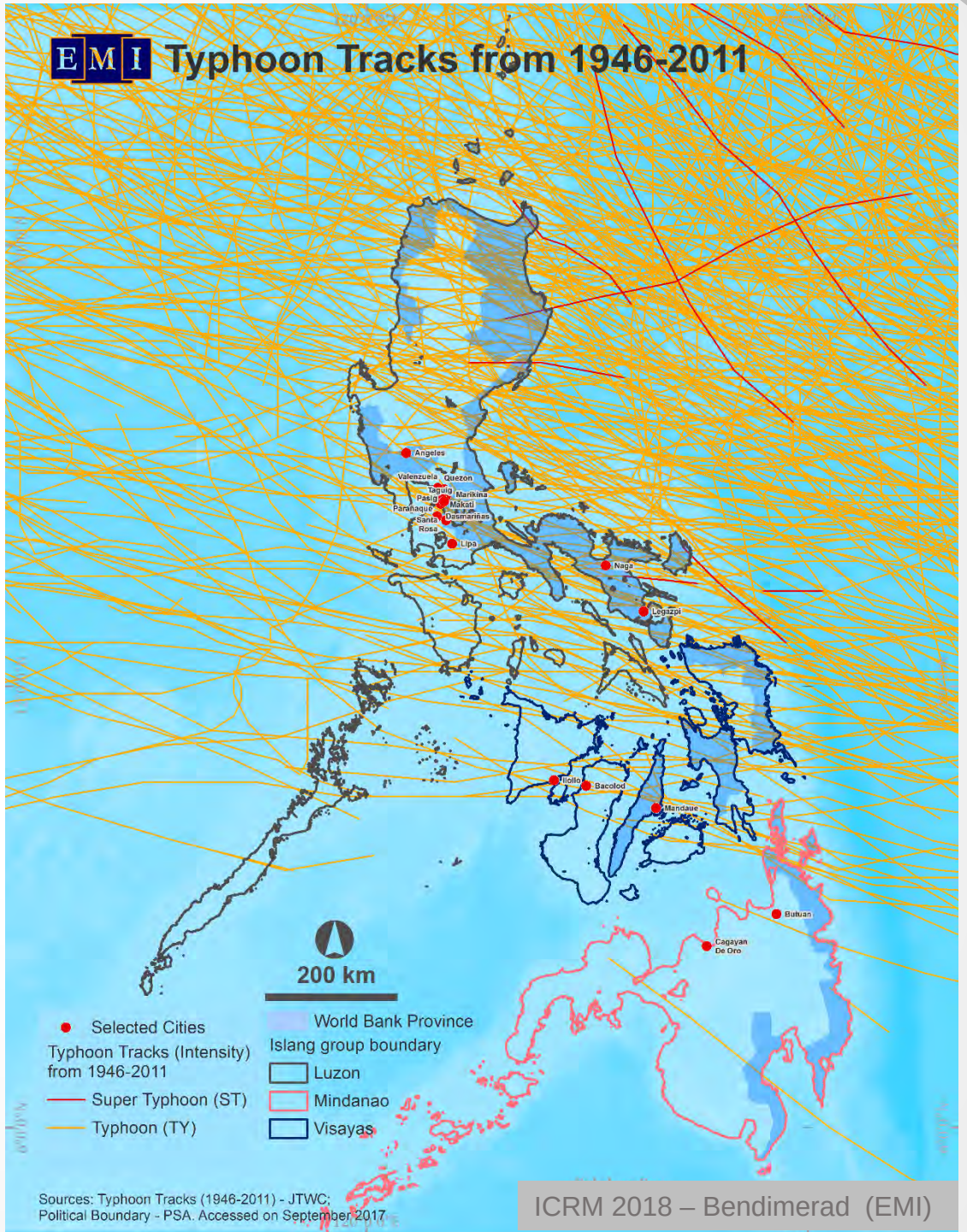
Comprehensive, cost-effective city disaster risk insurance solution providing access rapid response financing for post-disaster recover

- ✓ Great value: *advance risk awareness, better risk management, planned & efficient disaster response*
- ✓ Flexible coverage: Cities themselves decide what cover they wish to buy
- ✓ Accessible and valuable insurance
  - Certain and rapid funding for pre-determined triggering events
  - Cities will know within days of a catastrophe event occurring what sum they will receive and then physically receive the cash shortly after

Primary Hazard Map



Typhoon Tracks from 1946-2011



Lessons learned

- Insurance and risk financing are important elements in building resilience;
- The overarching mission is to protect state finances, the population, and the economy
- There must be a favorable governance/regulatory system that enables more innovation and reduces morale hazard;
- But that is inevitable because of the raising awareness and escalating losses (reduce contingency liability and shift cost);
- Innovation is bring sustainable, transparent and efficient risk financing mechanisms at a very low cost;

Lessons learned for TCIP

- TCIP cannot afford to fail - It is on its way to success with penetration in excess of 55% and its own capacity in excess of Euro 130 billion.
- In a long term
  - Move towards Indexed Parametric model
  - Improve exposure database – New Remote Sensing technologies enable us to have very detailed information
  - Use modern technology that provide ownership to the policy holder (e.g., crowd sourcing for claim adjustment)
  - Reserve experts for development of back office applications.

15 Years

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THANK YOU

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