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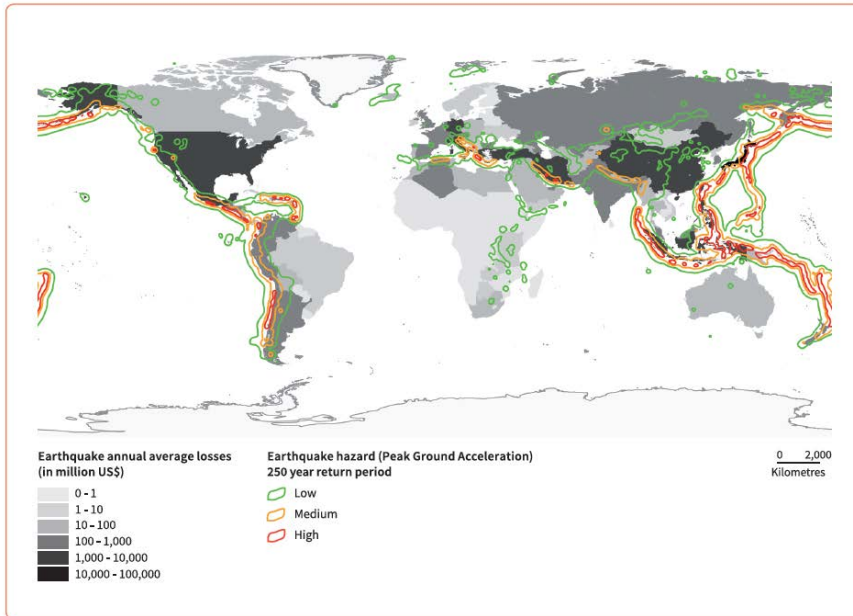
# Insurance Industry solutions for disaster risk financing

22<sup>th</sup> October 2013

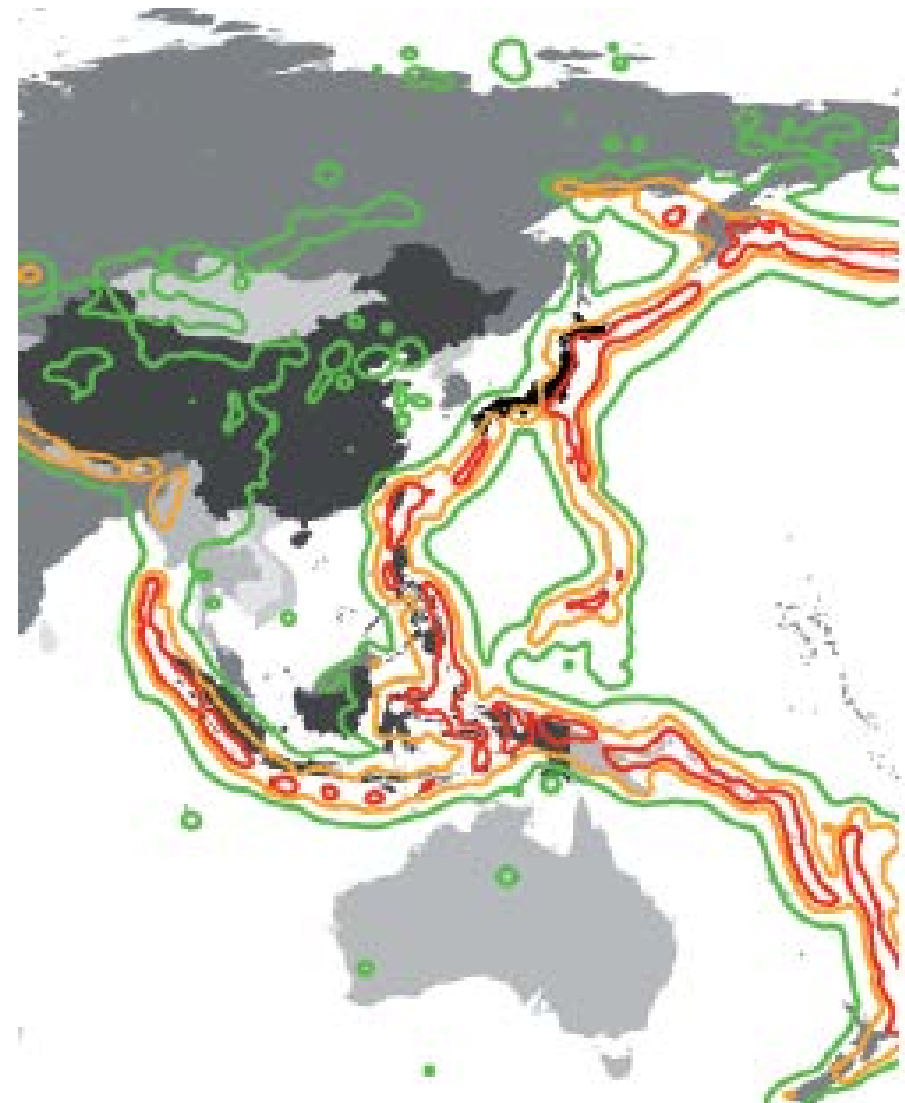
Michael Spranger

**AON** BENFIELD

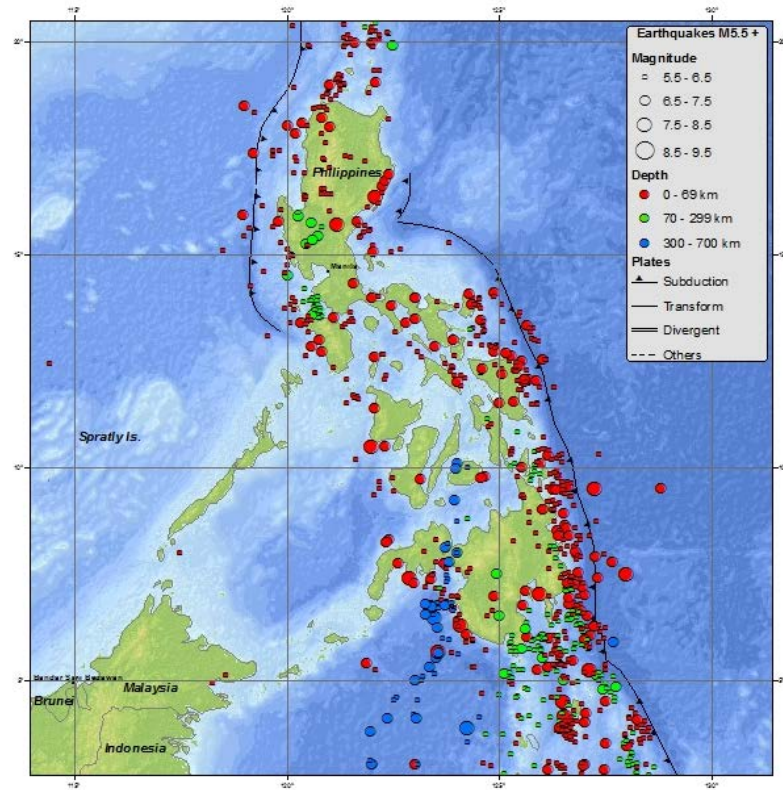
# A reminder - Asian EQ hazard



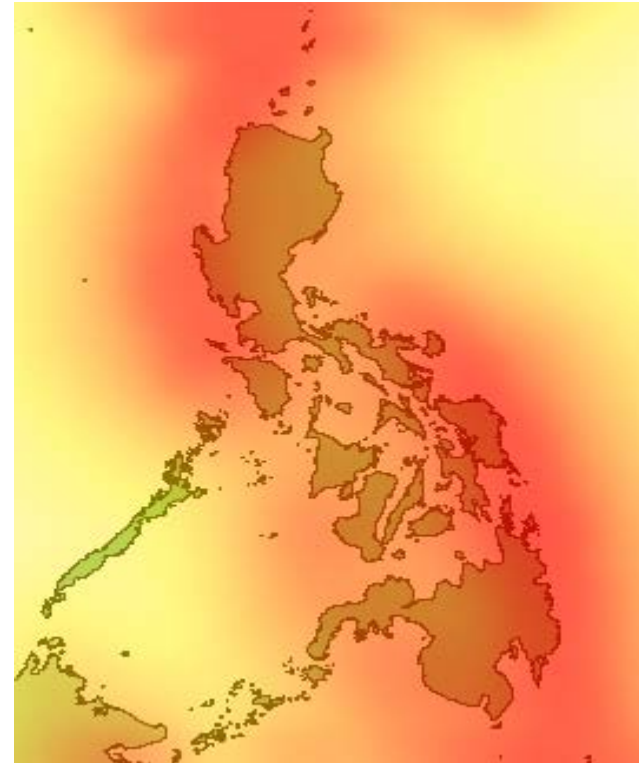
(Source: GAR global risk model)



# Seismicity and EQ hazard map Philippines

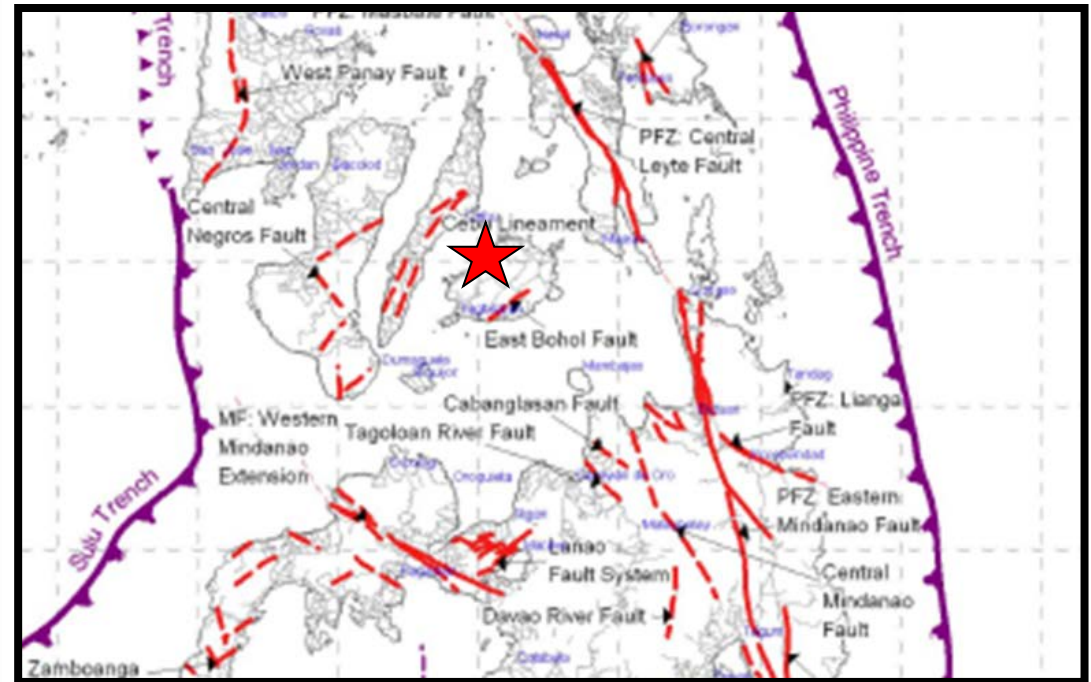
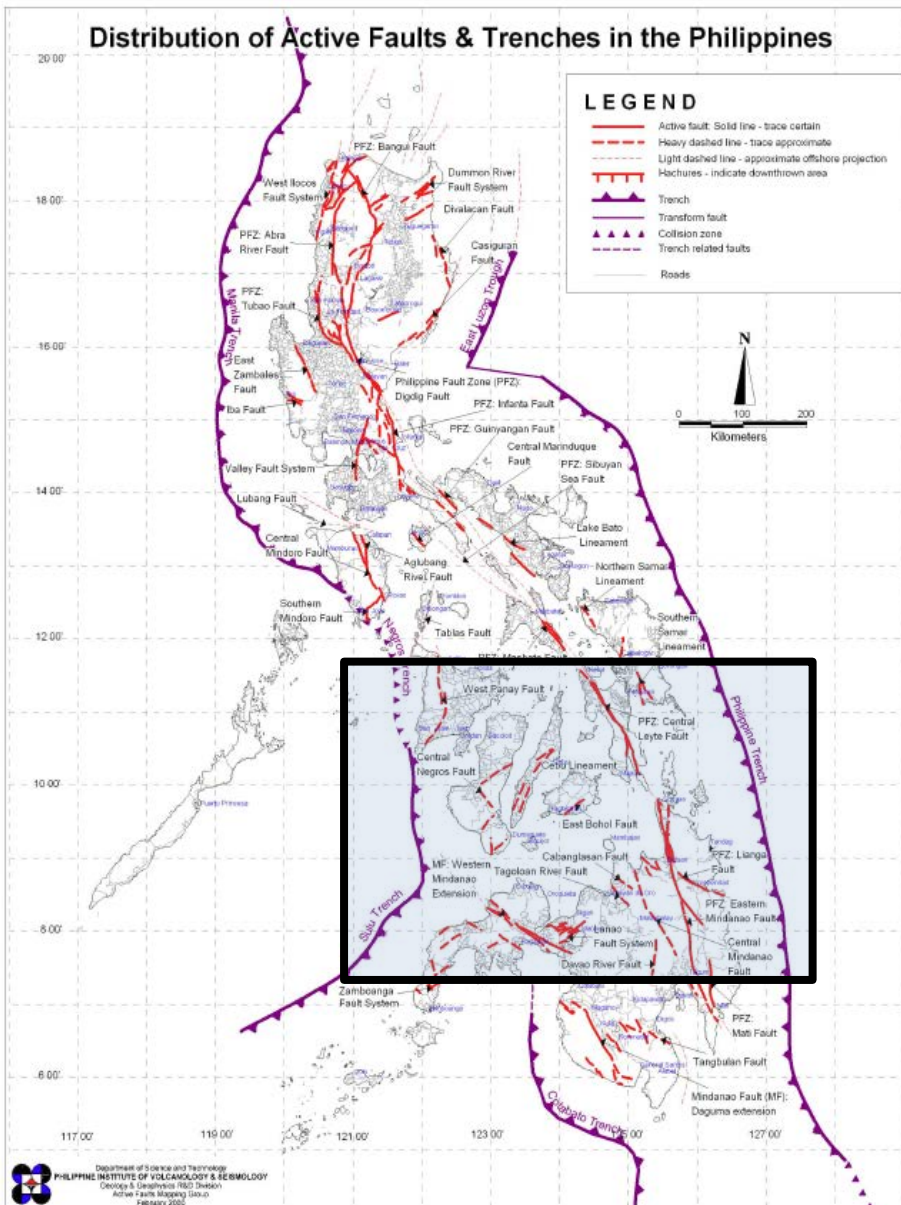


Historical Earthquakes  
in the Philippines (USGS)



Source: CAPRA Viewer:  
<http://risk.preventionweb.net:8080/capraviewer/main.jsp?countrycode=gar>

# Completeness of fault database (and models)



★ Epicenter of the M7.2 EQ 15/10/2013

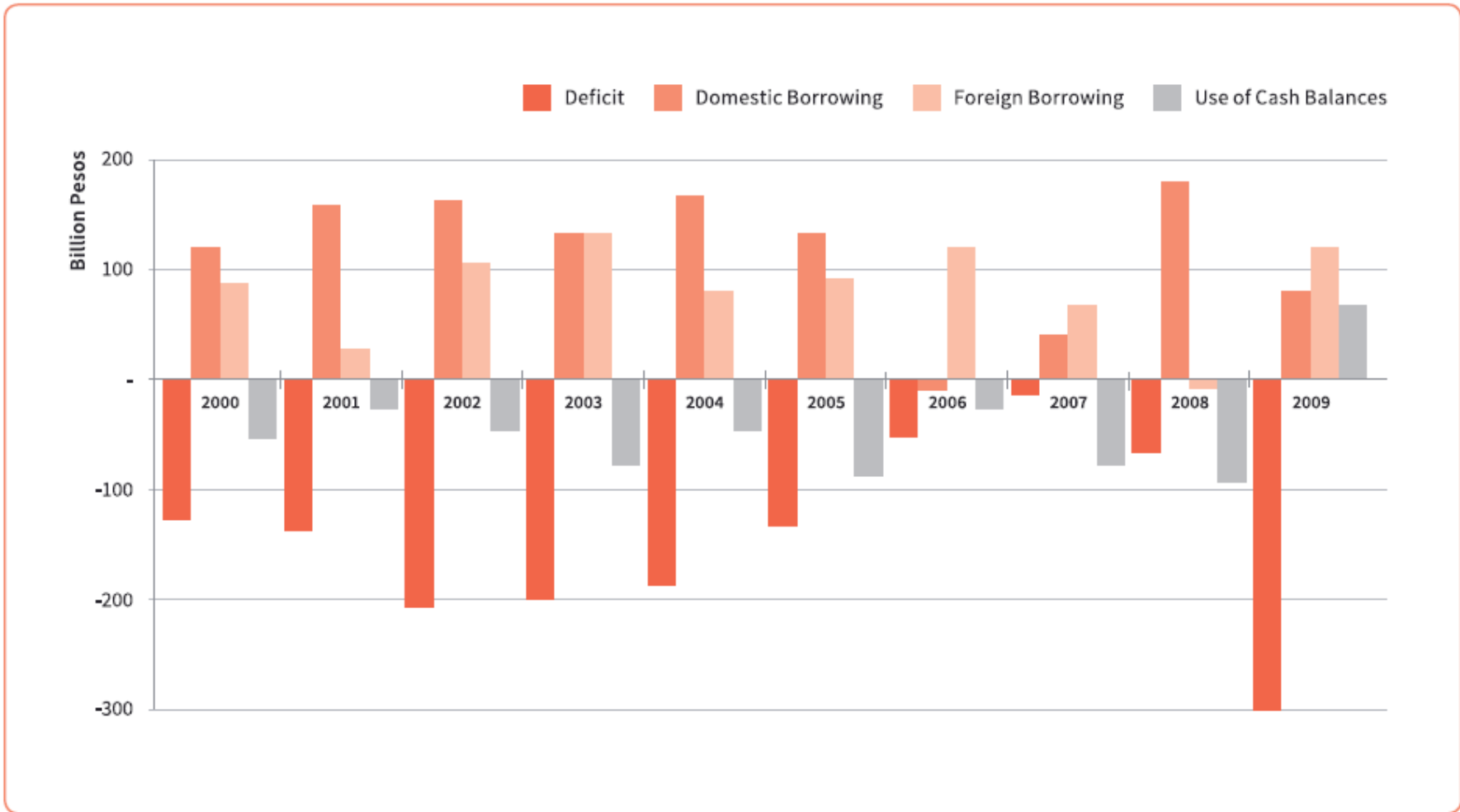
# Cost of disasters in the Philippines

**Table 1. Impacts of Disasters in the Philippines from 1982 to 2011**

Disaster	Number of Events	Persons Killed	Total Affected	Damage (000 US\$)
Drought	6	8	5,547,442	64,453
Earthquake (ground shaking)	12	2,540	1,979,265	380,025
Flood	20	356	3,385,505	84,651
Storm surge/ coastal flood	11	149	125,931	2,617
Landslide (wet and dry)	26	2,429	316,632	33,281
Storm/Tropical cyclone	185	23,096	91,197,264	5,529,644
Volcanic eruption	15	719	1,584,398	216,282

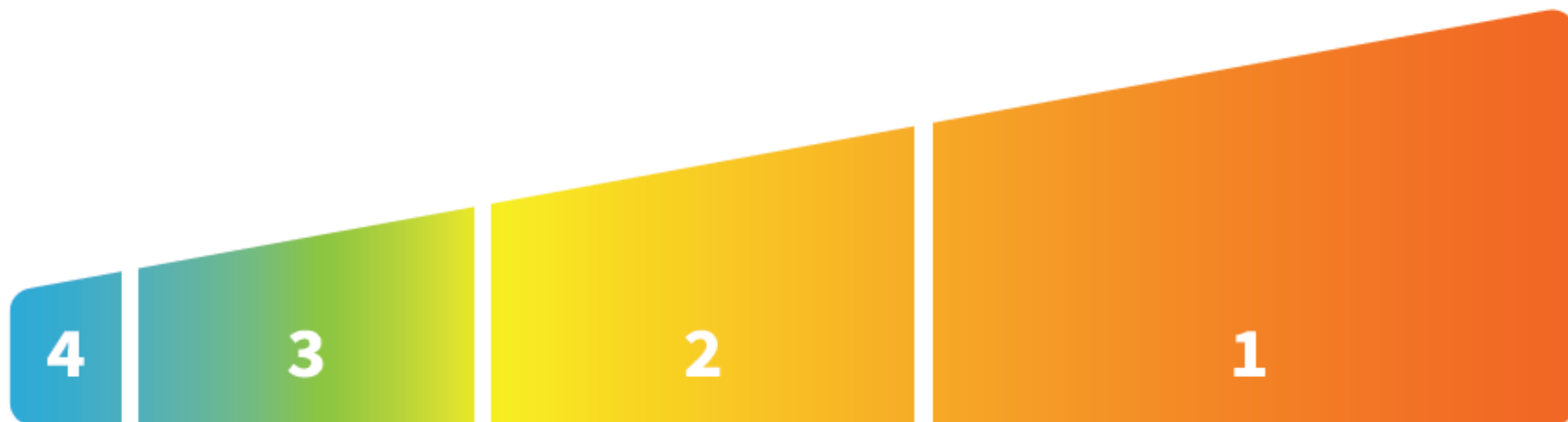
Source: EM-DAT: The OFDA/CRED International Disaster Database

# Disaster Financing Gap Philippines



(Source: Jose, 2012)

**Figure 5.3** Fiscal probable maximum losses (PML) from earthquakes with a 250 years return period compared with national revenue



**1 = 20 - 40%**

Philippines



**2 = 10 - 20 %**

Afghanistan, Bhutan, Dominican Republic

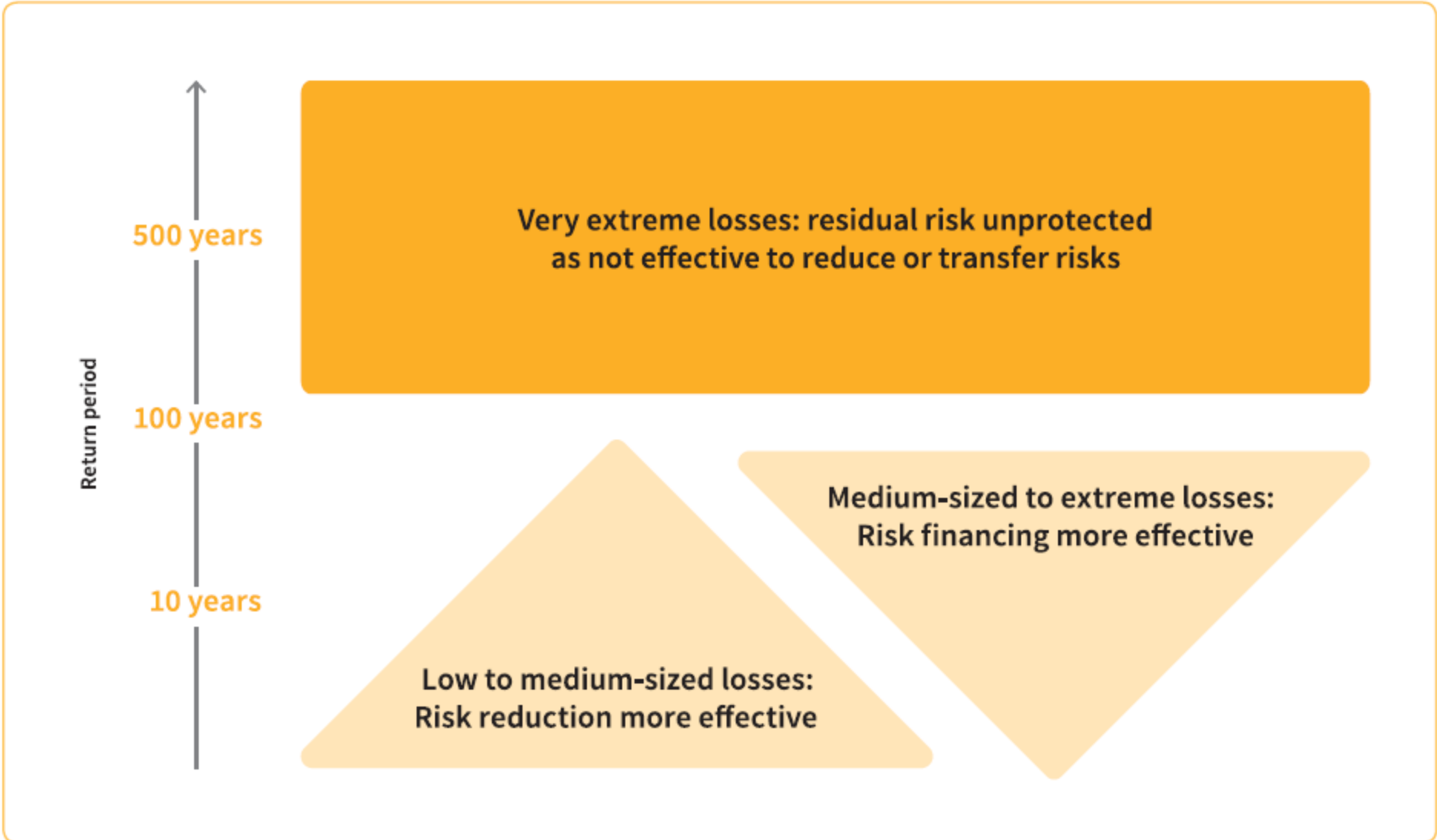
**3 = 1 - 10 %**

Armenia, Azerbaijan, Bangladesh, Bulgaria, Barbados, Colombia, Costa Rica, Fiji, Jamaica, Jordan, Japan, Kazakhstan, Kyrgyzstan, Lebanon, Morocco, Pakistan, Peru, Republic of Moldova, Saint Vincent and the Grenadines, Trinidad and Tobago, Zambia

**3 = less than 1 %**

Austria, Benin, Burkina Faso, Bahrain, Bahamas, Belarus, Bosnia and Herzegovina, Canada, Chile, China, Cyprus, Denmark, Egypt, Estonia, Finland, France, Croatia, Hungary, India, Ireland, Iceland, Israel, Kenya, Cambodia, Kuwait, Liberia, Lesotho, Macao Special Administrative Region of China, Madagascar, Maldives, Malta, Mauritius, Nigeria, Netherlands, Norway, New Zealand, Poland, Portugal, Qatar, Republic of Korea, Saint Kitts and Nevis, Seychelles, Singapore, Sierra Leone, Slovakia, Slovenia, South Africa, Sri Lanka, Thailand, The former Yugoslav Republic of Macedonia, Togo, Uganda

*(Source: UNISDR, based on GAR global risk model and World Bank data<sup>iii</sup>)*



(Source: Mechler et al., 2012)



# Some sense of urgency – Lloyd's Global Underinsurance Report (2012)

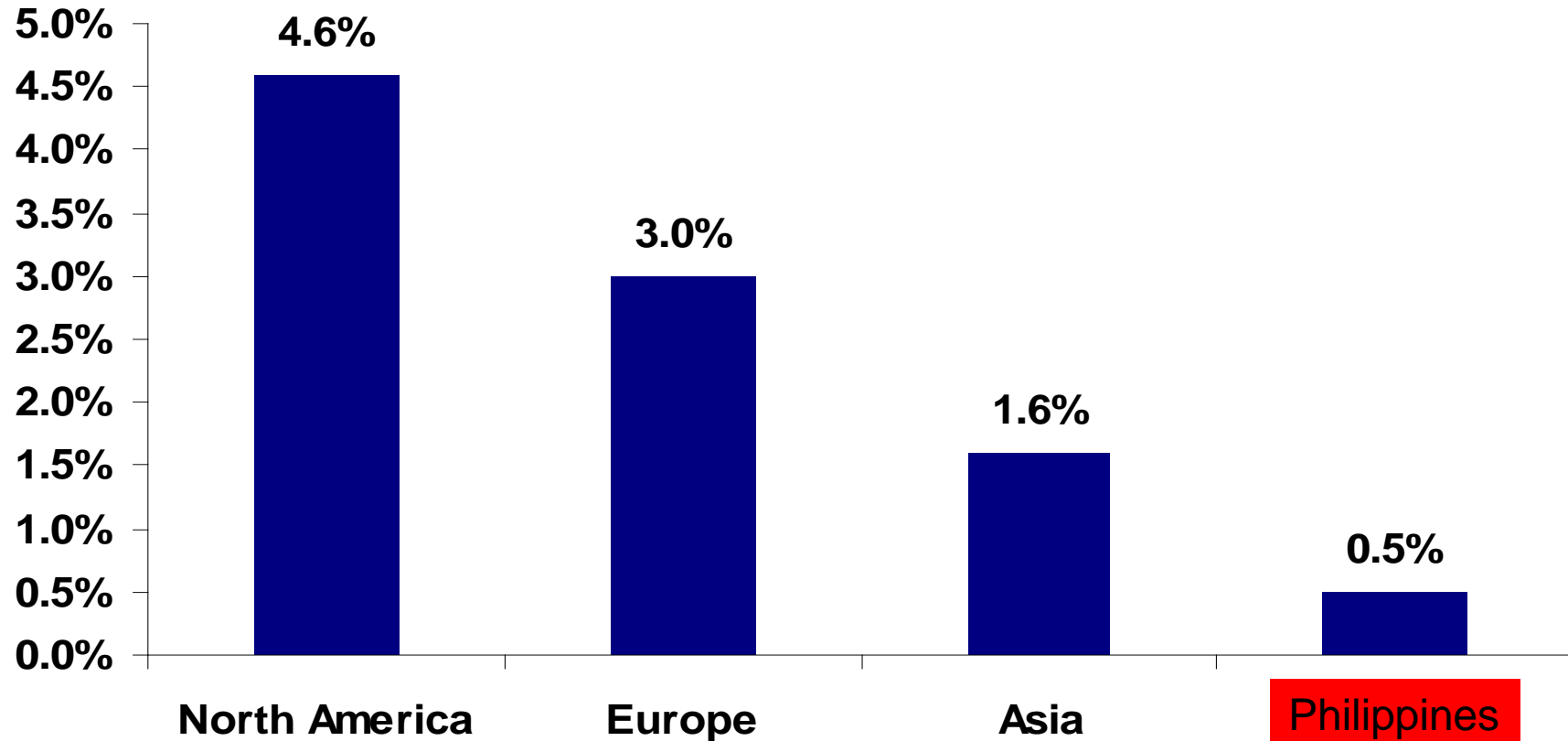
Table 4 - Insurance classification of countries (2011)

Tier 1 (Better insured)		Tier 2 (Moderately insured)		Tier 3 (Underinsured)	
Country	Benchmarked insurance level	Country	Benchmarked insurance level	Country	Benchmarked insurance level
Netherlands	8.01	Denmark	1.36	Hong Kong	-0.03
New Zealand	3.05	Spain	1.05	Poland	-0.15
South Korea	2.55	South Africa	1.02	Colombia	-0.17
United States	2.53	Taiwan	0.97	Thailand	-0.41
Canada	2.47	Ireland	0.75	Brazil	-0.51
Germany	2.11	Italy	0.62	Mexico	-0.67
Austria	1.67	Argentina	0.44	Saudi Arabia	-0.93
United Kingdom	1.60	Israel	0.44	Chile	-0.97
Australia	1.39	Sweden	0.44	China	-1.09
		Japan	0.43	Nigeria	-1.11
		France	0.39	India	-1.18
		Russia	0.34	Turkey	-1.31
		Norway	0.25	Egypt	-1.36
		Malaysia	0.15	Philippines	-1.36
		United Arab Emirates	0.08	Vietnam	-1.38
		Singapore	0.08	Indonesia	-1.67
				Bangladesh	-2.64

“Of the 17 countries identified as underinsured, eight are found in Asia”

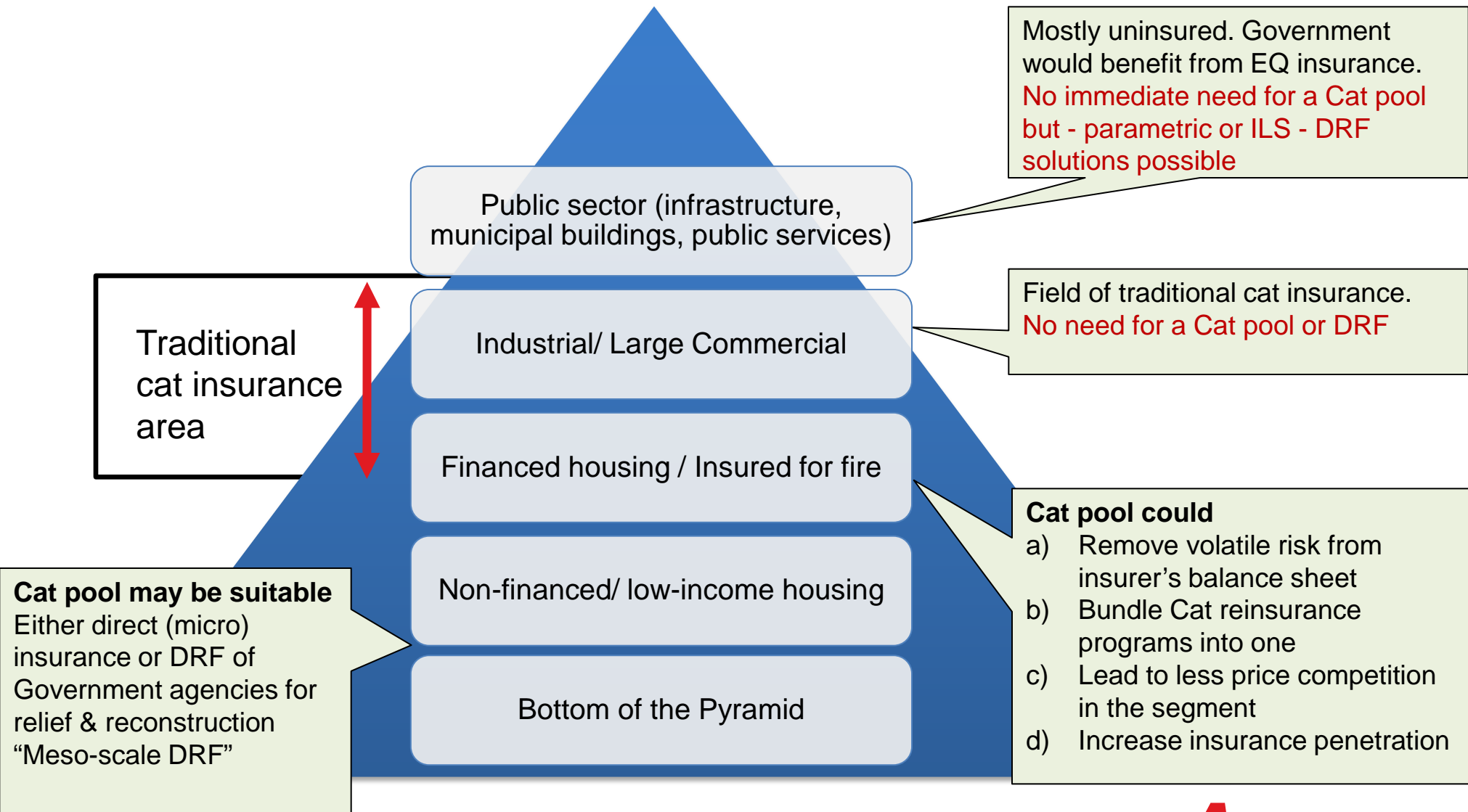
# Low Insurance Penetration in Asia

- Non Life Insurance Premiums as % of GDP 2007

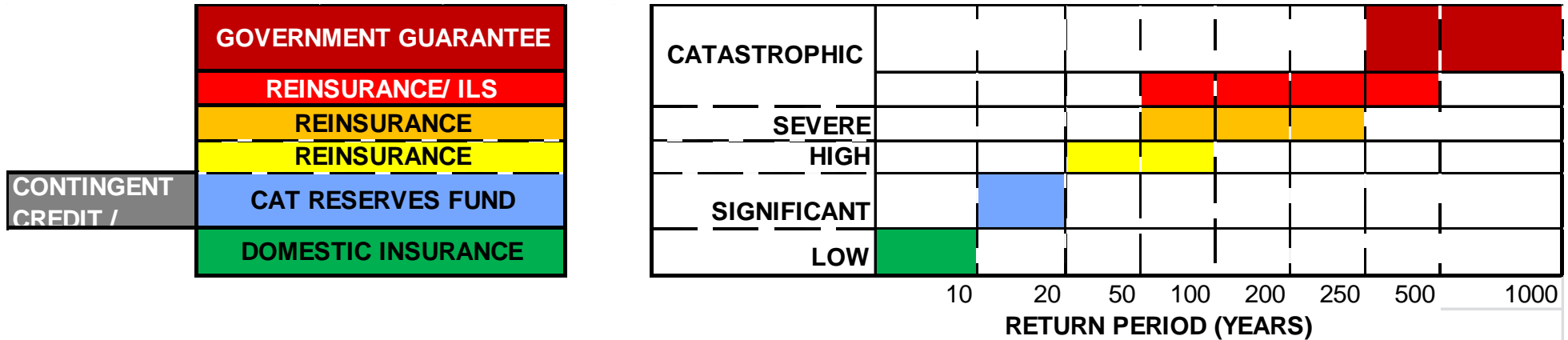


Source: Sigma World Insurance in 2007

# Recommended place for Cat Pools and DRF solutions



# Conceptualized design of DRF schemes



- Domestic insurance layer handles administration of payments and claims – limited risk taking
- Catastrophe reserves fund pays for small, frequent losses
- Catastrophe reinsurance layers fund losses up to approx. 1/250 year return period
- Cat bonds may be suitable in place of upper reinsurance layer if capacity limited – likely to be more expensive than reinsurance
- Essential: Top risk to be assumed by Government (as in TREIF, EQC, TCIP, not so in CEA\*)

\* TREIF (Taiwan Residential Earthquake Insurance Fund), EQC (New Zealand Earthquake Commission) , TCIP (The Turkish Catastrophe Insurance Pool), CEA (California Earthquake Authority)

# Cat Pools – Key features

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- Pools are important features of the risk management scheme for countries with a high exposure to NatCat risks
- The design of the individual solution (legal framework, institutional structure, terms and conditions, risk financing strategy etc.) is the crucial point of success

- **Public Private Partnership**

- **Public sector -> Legal framework, cover remote “top” risk (uninsured cat risk is already carried by government by default)**
- **Private sector -> risk assumption, distribution & loss assessment**

- **Element of compulsion required for diversification and reaching a critical mass**

# Roles of governments in (national) Cat pools

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- Provision of legal framework
- Supervision & Regulation
- Operation of pool
- Ultimate risk carrier
- Decision maker concerning coverage and price (EQC)
- Education & risk awareness programs (EQC)
- Premium subsidy (EQC)

**=> Government commitment is pivotal  
for success of any Nat Cat scheme!**

## Keep It Simple and Affordable!

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- Mitigate overheads related to appeals, reassessments and arguments.  
Consider:
    - A national hazard premium rate could be tolerated
    - Adjustments for construction and soil type could be kept simple and limited, or non existent
  - Physical damage only is simplest
    - Temporary accommodation expenses or business interruption cover may be left to private sector
- Simplicity is easier for home insurance than for business

## Pools differ with respect to

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- Governance (majority some form of government owned enterprise)
- Perils covered (dominating / all / some / all but dominating / ...)
- Coverage (Building / Contents / Land damage)
- Distribution channels (Insurance market / taxes / banking)
- Claims trigger (First Loss / total loss / parametric)
- Deductible structure
- Risk transfer / Reinsurance / Government guarantee
- Government subsidy (none / free coverage for some)
  
- Pricing philosophy – what is a “fair” price for the society?
- “Holistic-ness” (basic cover only / whole DRM suite)



# Rationale for Natural Catastrophe Pooling Schemes

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Why is conventional insurance market risk financing ineffective?

- Lack of risk awareness
- Lack of spread and critical mass to make insurance affordable – vicious cycle
- Anti – selection
- Little incentive for commercial insurance markets to promote residential catastrophe insurance:
  - High levels of capital required to retain the risk
  - Heavy reliance on reinsurance with volatile pricing
- Challenge of modelling and pricing the risk

# International Experience – Differences in Focus

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Nat Cat insurance for the residential sector:

- Provides the compulsion and critical mass to make residential catastrophe insurance effective and affordable, thereby reducing the risk of financial loss on householders, finance sector and ultimately governments.
  - Turkey (EQ),
  - Taiwan (EQ),
  - NZ (EQ),
  - California (EQ),
  - Romania (EQ).

# International Experience – Differences in Focus

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- Rapid funding for loss of infrastructure and government revenues
  - E.g. Caribbean (EQ and Wind)
- Benchmarking of pricing and coverage provided in the commercial insurance market
  - E.g. Indonesia (EQ)– MAIPARK
- Provide supplemental capacity for the private sector
  - E.g. Florida (Wind) California (EQ)
- Government Disaster Funding Schemes
  - E.g. France, Spain, Switzerland



Economic loss: 210 bn USD

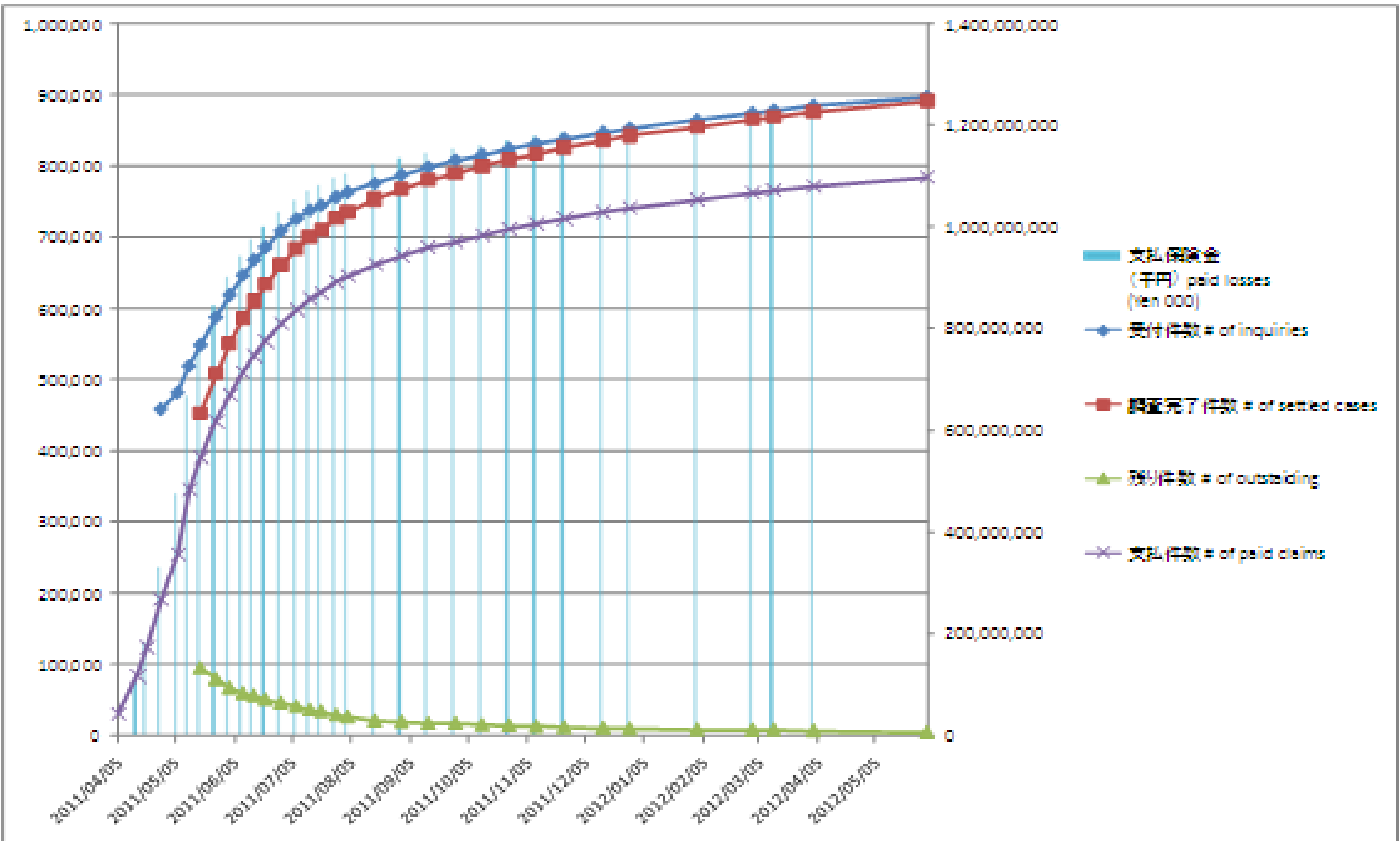
Insured loss: ~35-40 bn USD

1. JER scheme: 15 bn USD
2. Cooperatives 12.5 bn USD
3. Non Life (Commercial & Industrial): 7.5 bn USD

Reinsurance loss ~ 12 bn USD  
(out of 2. & 3. only)

**Natori, 2011**

# Fast payment – almost all claims paid one year after!

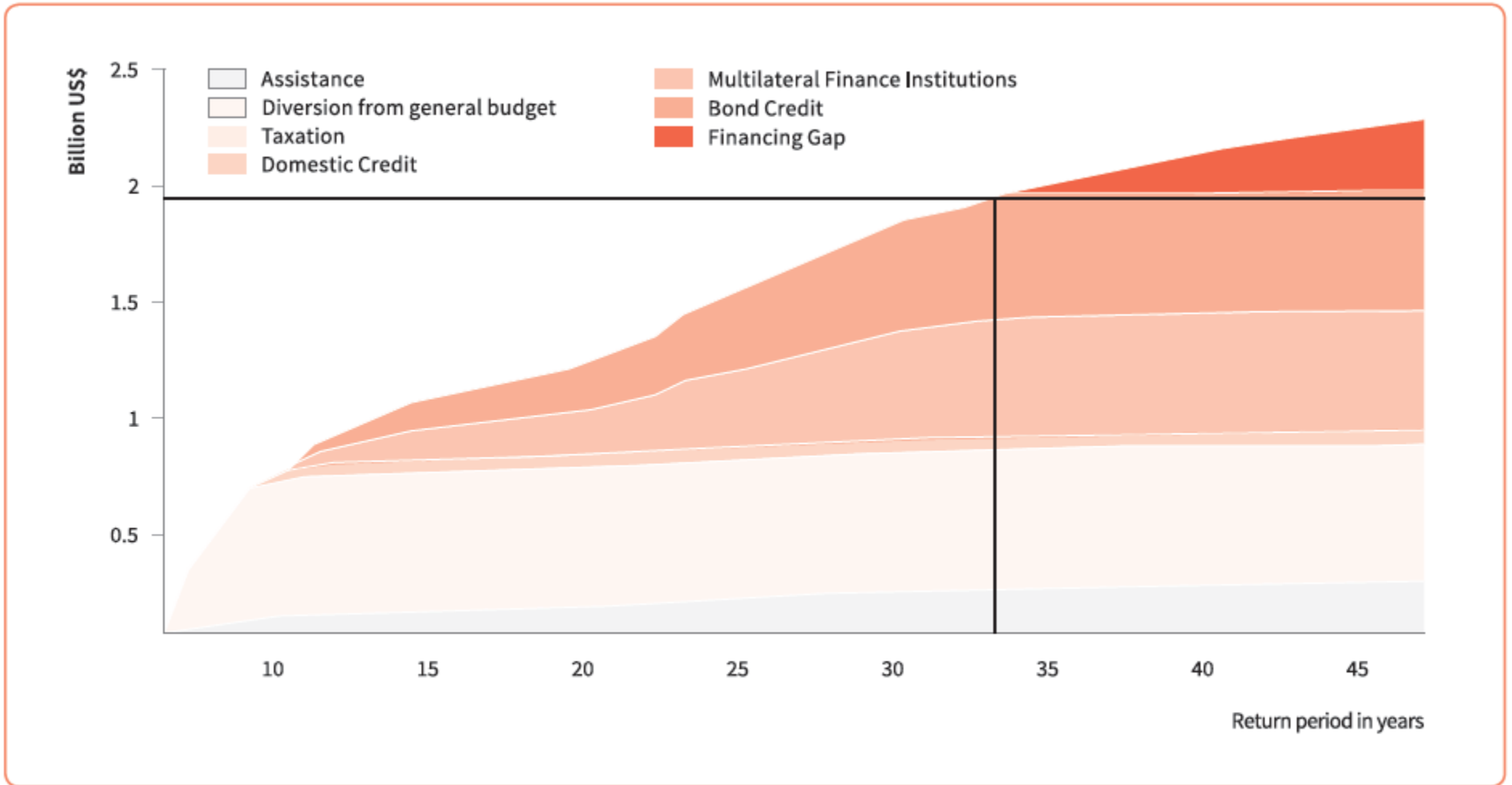


# International Experience – Perils Covered

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- Earthquake, Wind or Flood?
  - **Usually only the main peril covered**
    - **Indonesia, Turkey, Taiwan, New Zealand, Florida, California, Texas, Louisiana**
  - **Sometimes combination of Natural Perils**
    - **Romania, Caribbean, Norway, Spain**
  - **Sometimes combination excluding the major peril**
    - **France (wind excluded), Switzerland (quake excluded)**

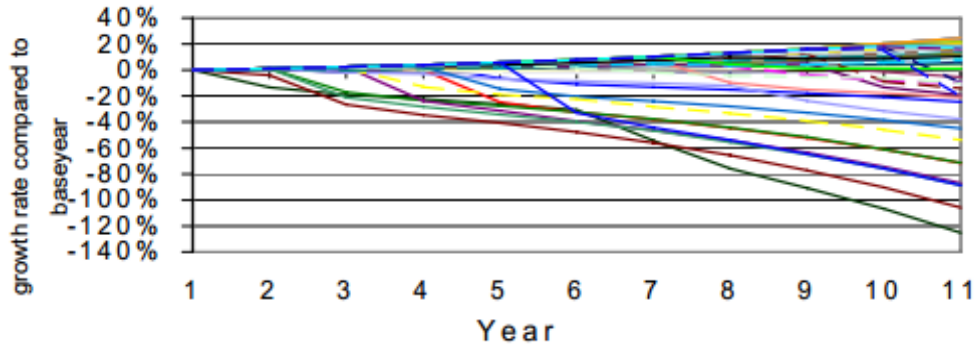
# Visualization: Financing Gap



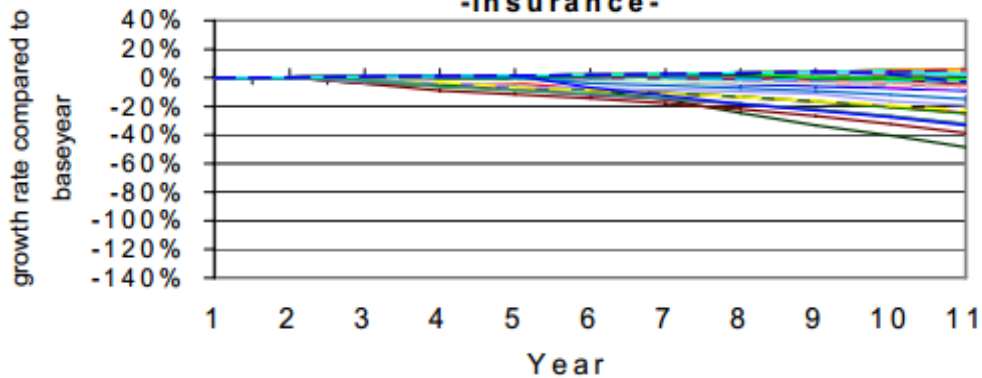
(Source: Hochrainer et al., 2013)

# Visualization: Impact of Financing Gap

**El Salvador growth paths  
-no insurance-**

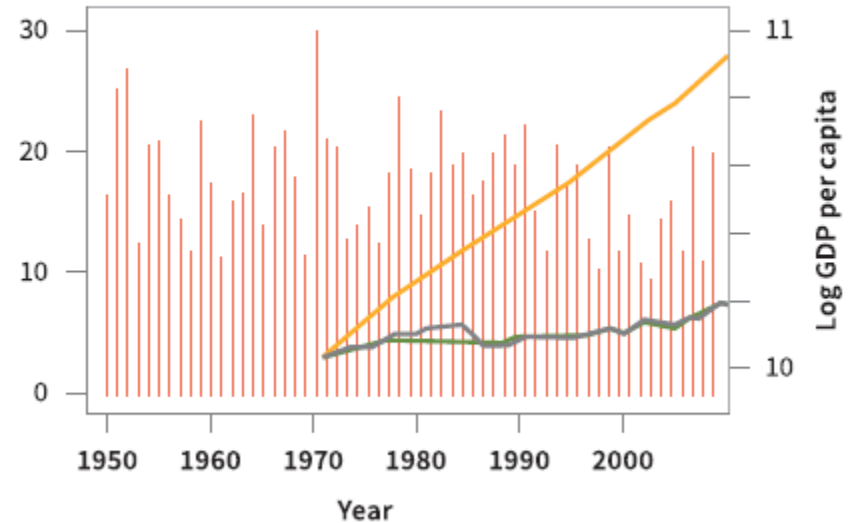






**-insurance-**



CatSim - Source: Mechler et al (2006)

**Philippines**



-  Cyclone wind speed
-  Observed GDP
-  GDP simulated with full model
-  GDP simulated with tropical cyclones removed

*(Source: Hsiang and Jina, 2012)*



# Aon Benfield's Leading Role in National Catastrophe Schemes

	Pool / Scheme	Aon Benfield	Guy Carp.	Willis	Remark
1	The New Zealand Earthquake Commission (EQC)	Sole			
2	Interkantonaler Rückversicherungs-Verband Fund (IRV)	Sole			
3	Indonesia Earthquake Pool (MAIPARK)	Lead	Co		
4	Norwegian Natural Perils Pool (NNPP)	Lead		Co	
5	Swiss Elemental Perils Pool (ES-Pool)	Lead		Co	
6	California Earthquake Authority (CEA)	Lead			
7	Romanian Catastrophe Insurance Scheme (PAID)	Lead	Co	Co	
8	Taiwan Residential Earthquake Insurance Fund (TREIF)	Co	Lead		
9	Turkish Catastrophe Insurance Pool (TCIP)	Lead	Co		
10	Caribbean Catastrophe Risk Insurance Facility (CCRIF)		Sole		
11	Icelandic Catastrophe Fund (Iceland)		Sole		
12	Japan Earthquake Reinsurance Co., Ltd (JER)				None
13	French Natural Disaster Compensation Scheme (Cat Nat Scheme)				None
14	Consorcio de Compensación de Seguros (Spain, CCS)				None

- AB the lead or sole broker for 8 out of the 11 schemes that use brokers worldwide.
- AB's leading position in national schemes will bring the most valuable global experience to pools to be built in the region (NCIF, PHL, IDN,...)

# Leading Contribution to Asian Catastrophe Schemes

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Aon Benfield has played a leading role in promoting and facilitating Catastrophe insurance schemes in Asia:

- Dedicated team based in Singapore focused on national disaster risk financing schemes.
- Provided advisory services in the formation of the Taiwan Residential Earthquake Insurance Fund (TREIF) in 2001
- Assisted in the establishment of the Indonesian Earthquake Pool in 2002/3— forerunner of MAIPARK.
- Designed and priced a homeowners' disaster relief scheme for Indonesia in conjunction with the Indonesian Disaster Relief Agency and MAIPARK.
- Active advisor to ADB on proposed Philippines National Cat Insurance Pool.
- Active contribution to conferences and seminars on Cat Risk Financing:
  - ADB Annual meeting, ASEAN Forum on Natural Disaster Risk, Asian Ministers' Conference on Disaster Risk reduction etc.

## Conclusion

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- Vulnerability of many Asian economies to cat risk – a pressing need for action
- National pooling schemes:
  - Make the insurance of cat risk effective and affordable
  - Facilitate the build up of a National cat fund
  - Reduce the financial consequences of natural disasters
- Commitment and prioritization can lead to major economic and social benefits
- Science is important – but the key success factor for Pools is legislation
- Aon Benfield is in a unique position to help in the development of Cat pools
  - due to worldwide experience
  - IF modeling capabilities and research network