Climate Resilience

The Role of Insurance

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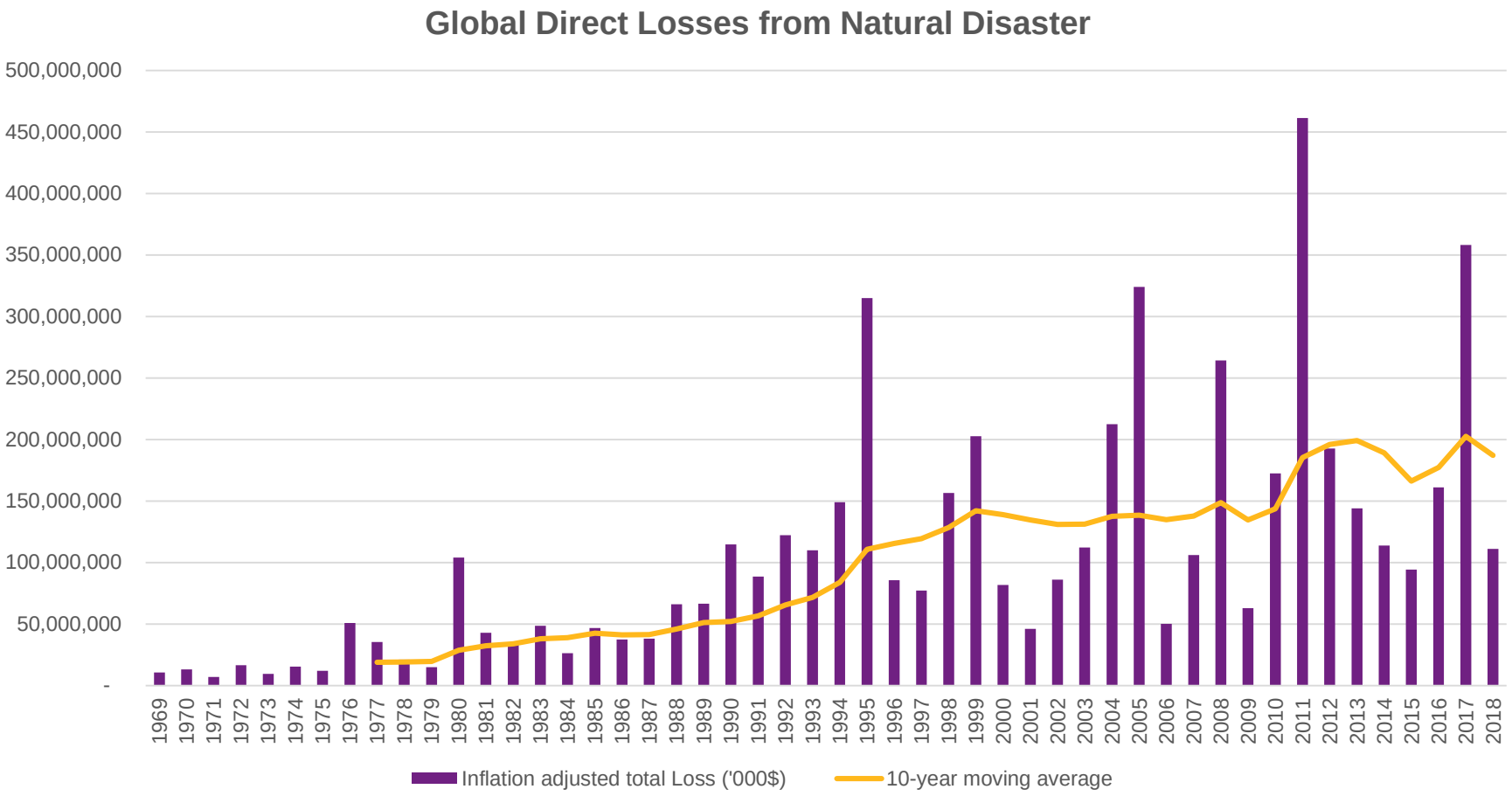
Why does resilience matter?

Resilience:

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

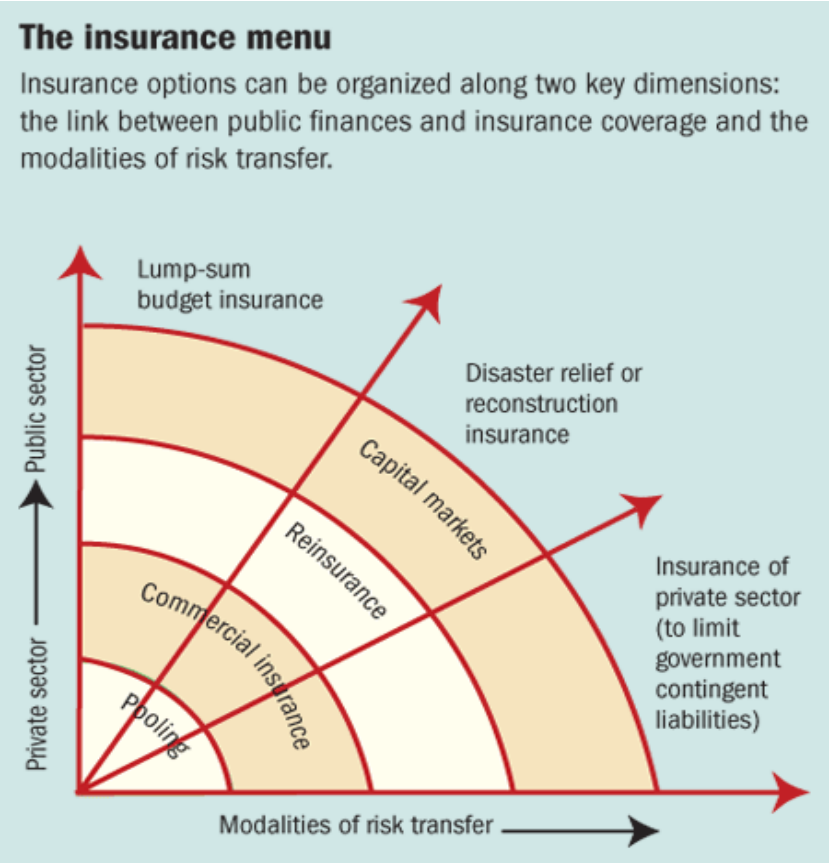
(2012 National Research Council report)

Why does resilience matter?



*Data from CRED EM-DAT; Excluding biological disasters.

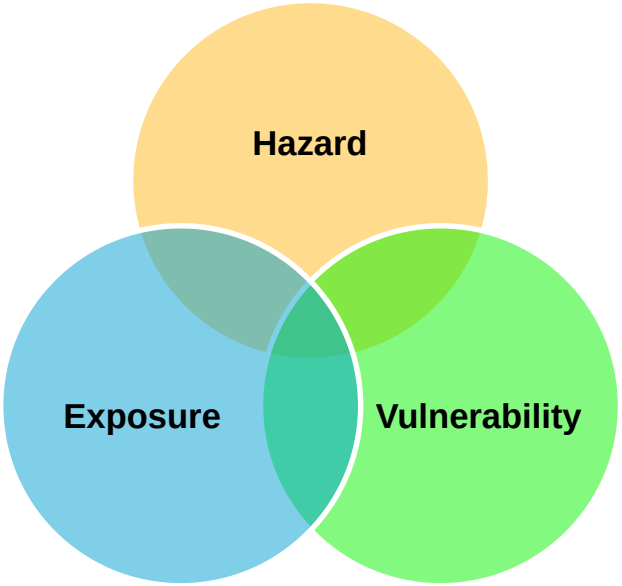
Rediscovering Insurance as an Institution

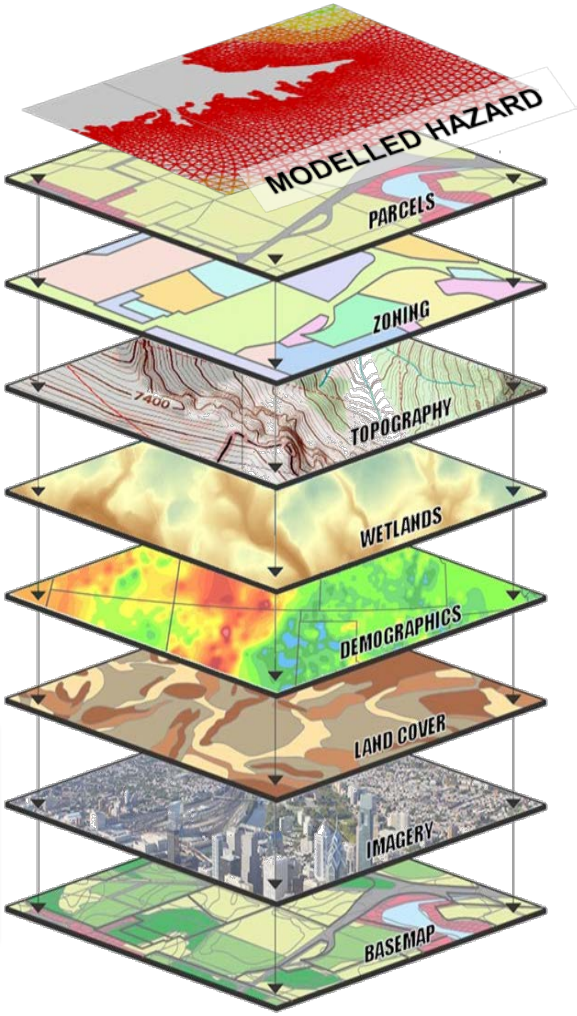


- An organizing framework for risk management
  - Understanding & Evaluating Risk
  - Establishing the economic and social trade-offs for sustainable growth
  - Defining & enforcing risk management rules and behaviors
  - Sharing excess
  - A source of pooled investment
- An institution of society, not an industry
  - From global to local scale
  - Across public, private and mutual/cooperative sectors
- A means of delivering on legal duties and agreements
  - Regulatory Requirements, Tort Liabilities
  - International Agreements, Statute Law
- A powerful multiplier of impact
  - For consumers the influence is perceived at the level of coverage
- A mechanism for incentives and influence
  - Informing decisions with the true costs of decisions, e.g. where and how to build community

The Capital, Science & Policy Practice

Applying the methods and tools of risk management and finance to reach additional communities and assets



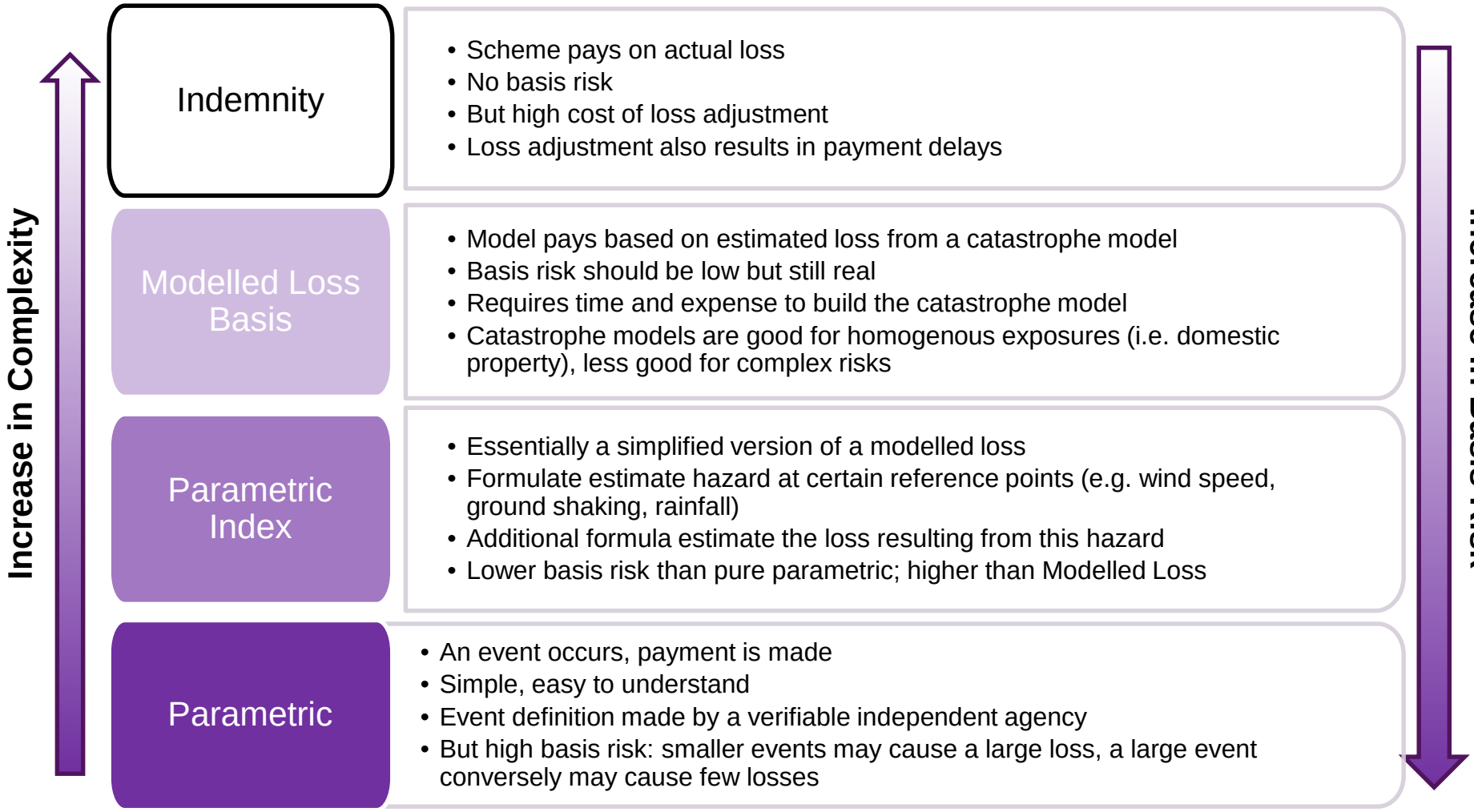


Methodologies → **Metrics** → **Models** → **Markets**

Risk Management & Transfer

The Tools: Indemnity or Parametric

Or Something In Between



The Tools: Indemnity or Parametric Insurance

Indemnity

- Requires loss (claims) adjustment process
- Pays on actual loss
- Cost of loss adjustment
- Payment delays due to loss adjustment

Parametric

- Payment upon triggering event
- Fast payments: Provides liquidity fast after disasters
- Simple, transparent: Event trigger defined by independent agency data (USGS, NOAA)
- Basis Risk

The Tools: Indemnity or Parametric Insurance

What is important?

Speed – both speed of payment and speed of set-up

Avoiding basis risk, i.e. accuracy of loss payment

Parametric Cover

Indemnity Cover

Schemes can promise payment within days of an 'event' occurring

Simplified policy terms can speed up indemnity payments but the chance of delay and dispute remains

Individuals cannot be exposed to basis risk, at micro level risk too high and tolerance low

But a fund may consider accepting some low level basis risk as a trade against speed of settlement

Parametric Insurance

- Immediate cash injection post disaster for initial disaster response for governments
- Livelihood protection for the poor
- But risk that an unusual event does not trigger payment

Indemnity Insurance

- Appropriate funds for reconstruction
- Can include allowance for build-back better
- But costs and delays at claim settlement

Global Resilience

Sovereign, Regional, and Global Risk Finance

Caribbean Catastrophe Risk Insurance Facility (CCRIF)

- First regional risk pool set up in 2007
- Parametric cover for tropical cyclone, earthquake, and excess rainfall
- Pays out within 14 days of a triggering event, notifying countries within 2 to 3 days

African Risk Capacity (ARC)

- Hybrid mutual insurer
- Parametric cover for drought and tropical cyclone
- ARC Agency provides technical advice on insurance and contingency planning

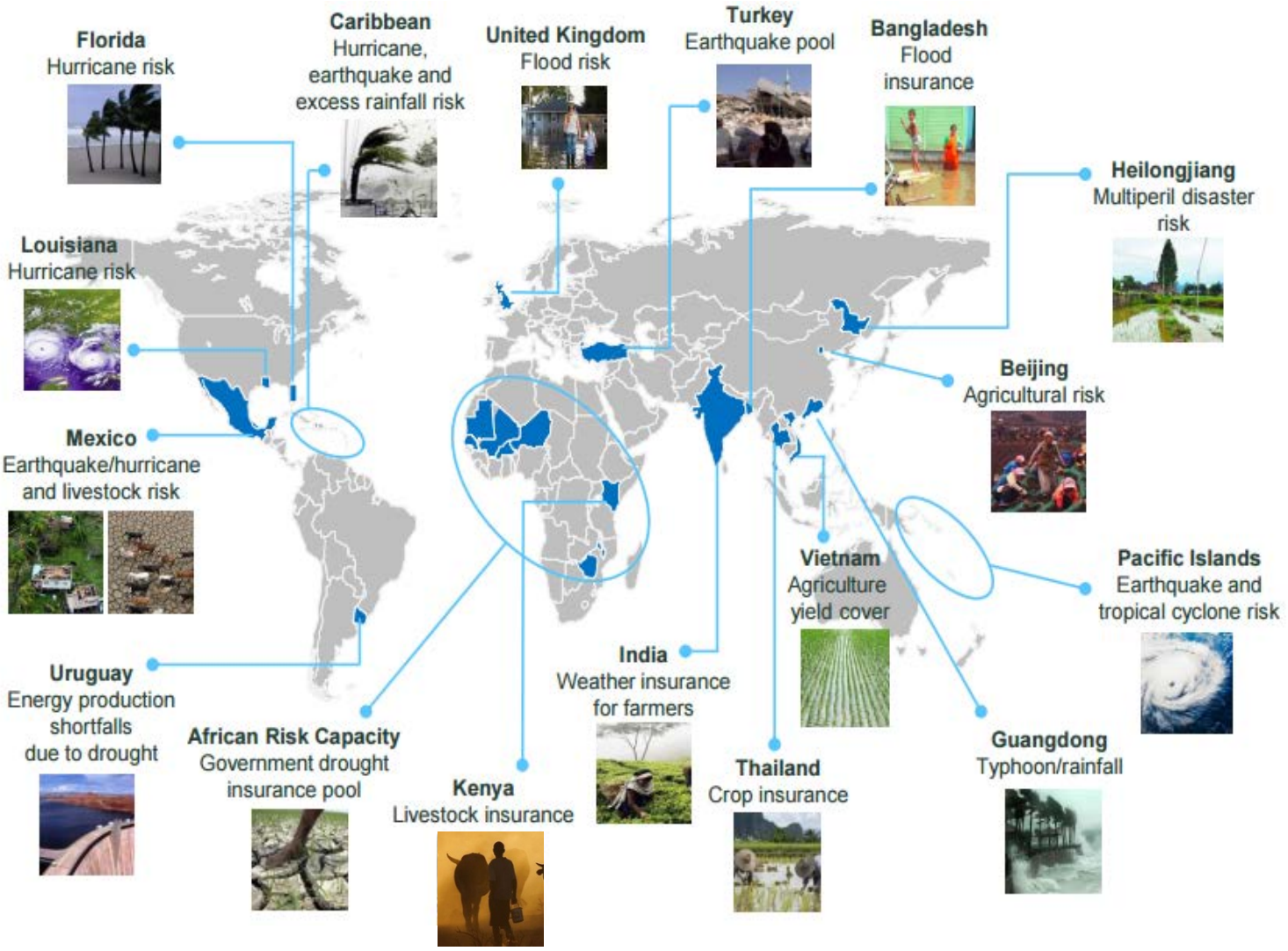
Pacific Catastrophe Risk Insurance Company (PCRIC)

- Captive Insurer backed by multi-donor trust fund
- Parametric cover for tropical cyclone, earthquake, and tsunami
- Precursor was the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), providing pilot risk transfer via the WB

Global Ecosystem Resilience Facility (GERF)

- Global facility providing finance and risk management to coastal communities, protecting ecosystems and incentivizing stewardship of the environment

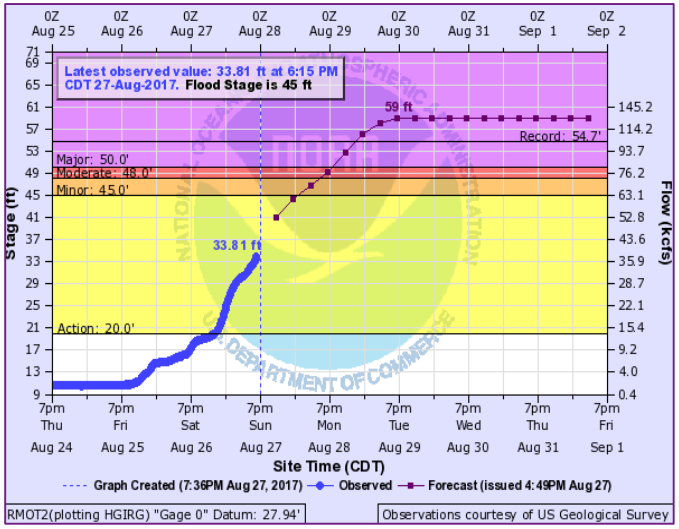
Innovative Risk Transfer Solutions for the Public Sector

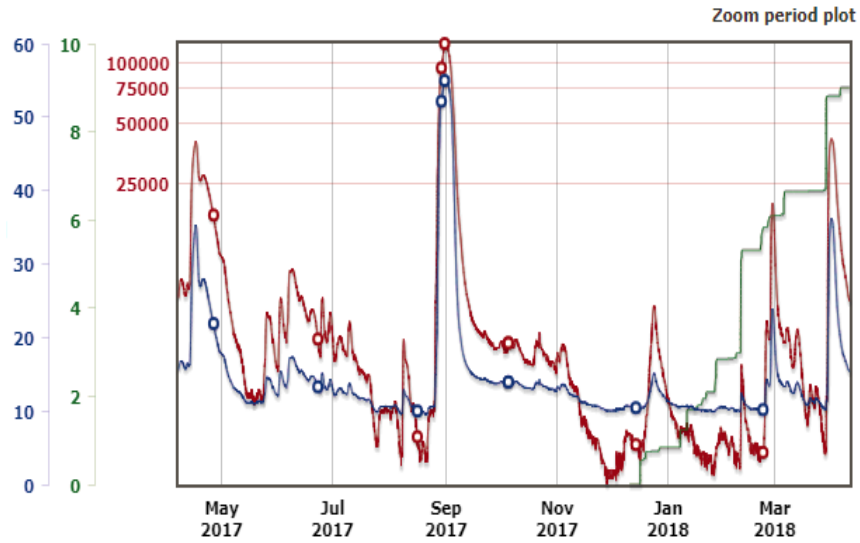


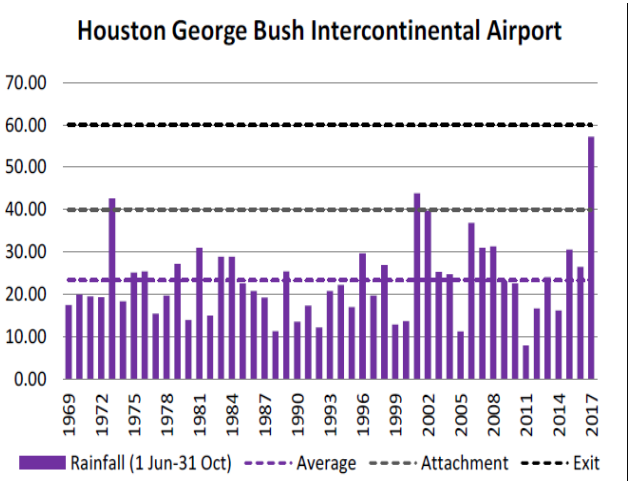
Structuring for a Parametric Solution for Flood and Drought

Case Study for River District

- Risks from localized rainfall and river flows from upstream precipitation
- Structure accounts for both of these risks with separate triggers that can operate independently and in combination
- Graduated payouts support non-damage costs and damaging droughts and floods







Investing in Ecosystem Resilience

Risk management and finance for natural capital

Risk Reduction

- Natural capital like reefs, mangroves, and dunes, and healthy ecosystems like estuaries, forests, coastal wetlands provide valuable risk reduction

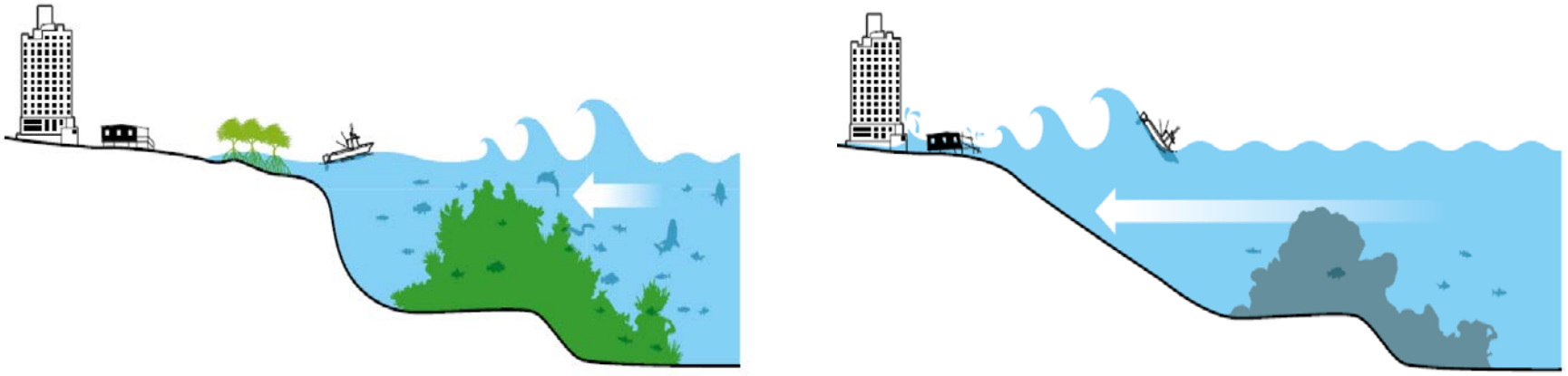
Quantification

- When the risk reduction benefits of this ‘green infrastructure’ can be modelled and quantified, its financial value can be quantified

Investment

- This provides a business case for investing in healthy ecosystems

Healthy ecosystems vs. degraded ecosystems



The MAR Fund

Parametric insurance, but for coral reefs

Reef Conservation and Management

- Mesoamerican Reef Rescue Initiative - supports ecologic and economic viability of the Mesoamerican Barrier Reef System
- Mexico, Belize, Guatemala and Honduras

Emergency Restoration

- Physical damage from hurricanes
- A parametric reef insurance for immediate post-disaster recover, i.e. remove debris and repair/replant the reef
- Used at seven sites across the four countries

Who pays?

- The MAR Fund trust at the moment, an endowment from German Development Bank

Pricing the Pool

Peril
Earthquake and/or Tropical Cyclone

Insurance limit
Maximum payout available under the policy

Minimum payout
Minimum payout if the policy is triggered

Tropical Cyclone	Fix… Sum Insured	Return Peri…	Premium	Recoveries
Event Sum Insured PHP	1,000,000,000	1 in 9… ears	69,073,310	0
Minimum Recovery PHP	100,000,000	**1 in 10 years**	**69,073,310**	**100,000,000**
Attachment Return Period	1 in 10 years (10.00%)	1 in 25 years	69,073,310	548,167,420
Exhaustion Return Period	1 in 50 years (2.00%)	1 in 35 years	69,073,310	773,144,422
Annual Premium PHP	69,073,310	**1 in 50 …rs**	**69,073,310**	**1,000,000,000**

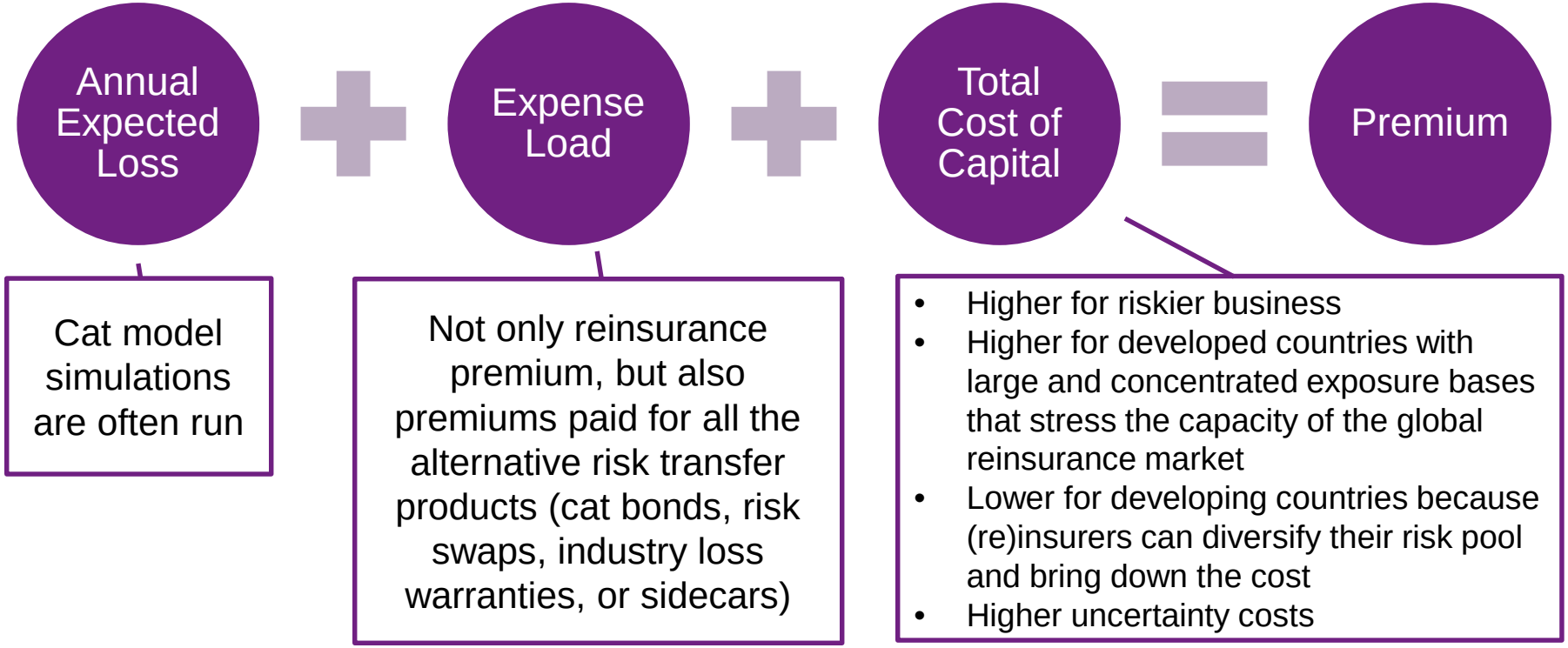
Annual premium
Cost of the targeted insurance coverage

Event severity
How often the policy can be expected to pay, on average

Pricing Considerations

Catastrophe Insurance Premium

Golden ratemaking formula…



Pricing Considerations

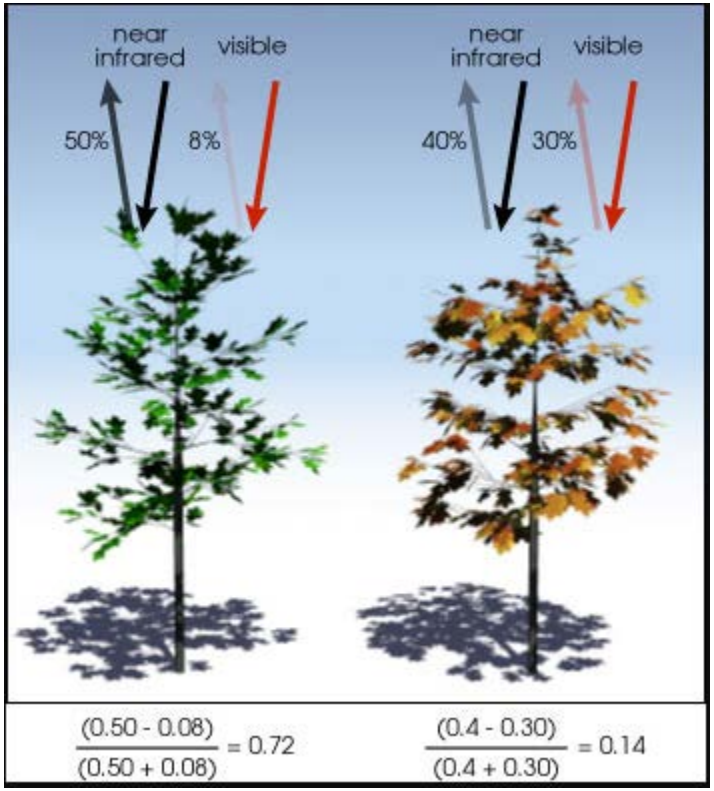
Indemnity vs Parametric

Indemnity	Parametric
Only model pure loss (unless specified by policy term)	Need to consider indirect loss (emergency cost, business expenses, increase supply or labor cost)
Normally deductible is part of the policy	No deductible
Mainly based on historical severity and frequency data	More reliance on third-party data since historical loss data is not sufficient

Pricing Considerations

Data Issue in Developing Countries

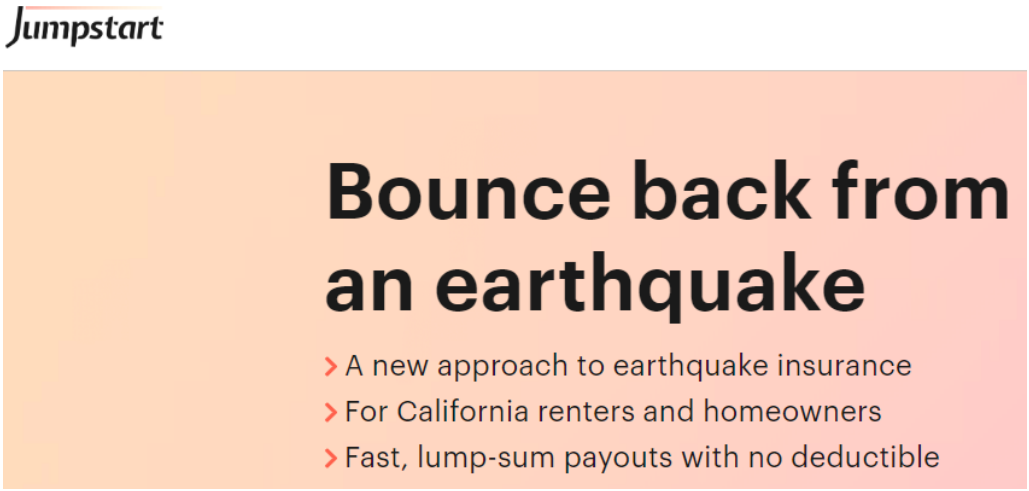
Traditionally, accessing quality weather data has been a key pain point for developing country.

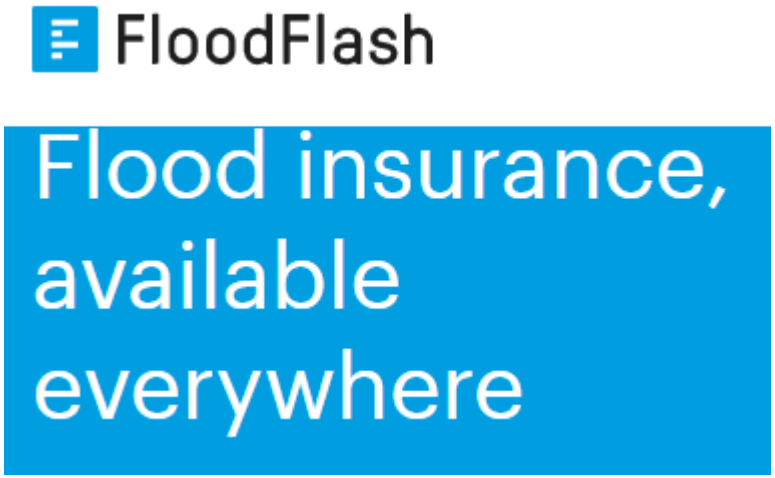


Normalized Difference Vegetation Index (NDVI)

Innovation in Parametric Insurance

What InsurTechs are doing?





Innovation in Parametric Insurance

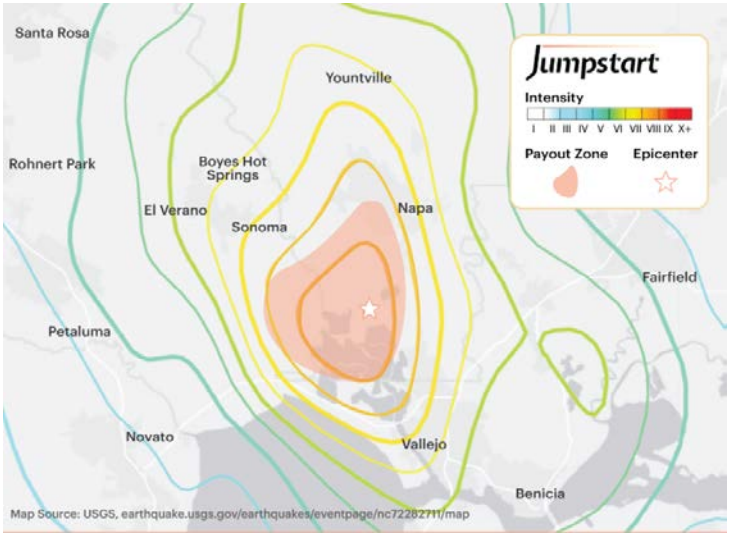
What InsurTechs are doing?

Jumpstart

Bounce back from an earthquake

- A new approach to earthquake insurance
- For California renters and homeowners
- Fast, lump-sum payouts with no deductible

- Fast and simple payments when there is an earthquake in policyholders' region
- Premiums are based on probability of reaching the "severe" USGS pre-specified shaking intensity at a specific zip code
- Only one text message to confirm loss or damage



Innovation in Parametric Insurance

What InsurTechs are doing?

FloodFlash

Flood insurance, available everywhere

- Available anywhere in the UK (excluding Northern Ireland)
- Designed for business owners and sold via broker
- Premiums are determined by location, settlement amount and trigger depth
- When event occurs, text/email to confirm loss or damage
- Using an installed sensor to determine whether a pre-defined flood water depth has been triggered

Innovation in Parametric Insurance

What InsurTechs are doing?

- Not an insurance product
- Sensors that provide detailed information on crop level KPIs to provide real-time information to growers
- Can be used for parametric agricultural insurance which the payout trigger is based on the sensor metrics

Thank you! Questions?