

Financial Innovation in Disaster Risk Management

Public Private Partnership in building resilience against flood risks

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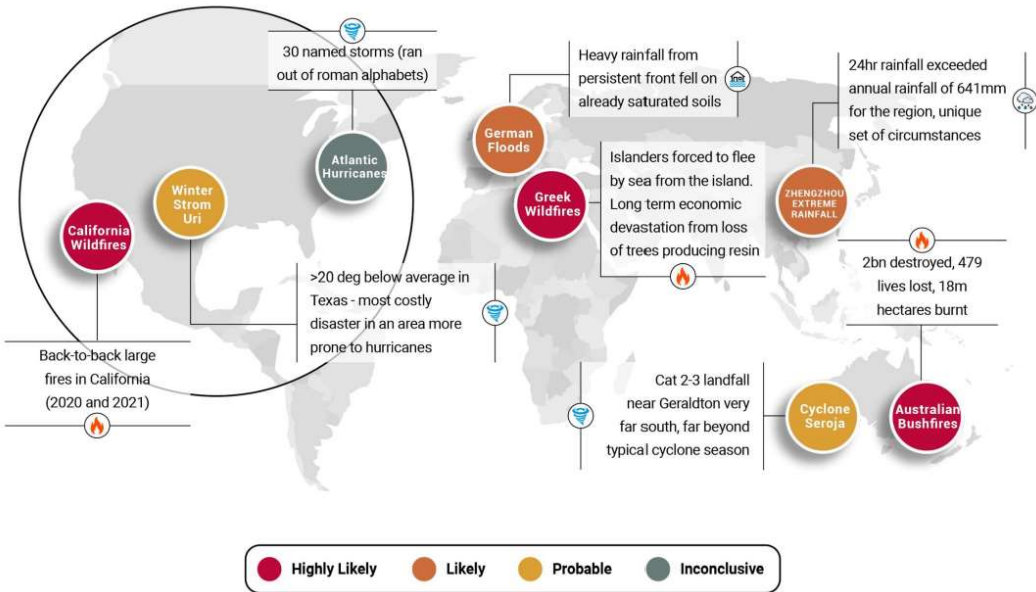
Public Sector Solutions, Swiss Re 瑞士再保险公共利益风险业务部

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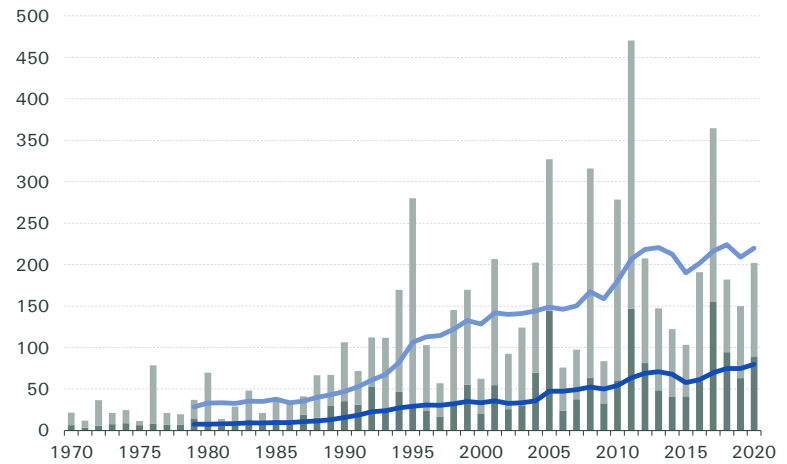
Natural Disasters: Global Overview

Climate catastrophes and protection gap globally

2020/2021 Global climate catastrophes



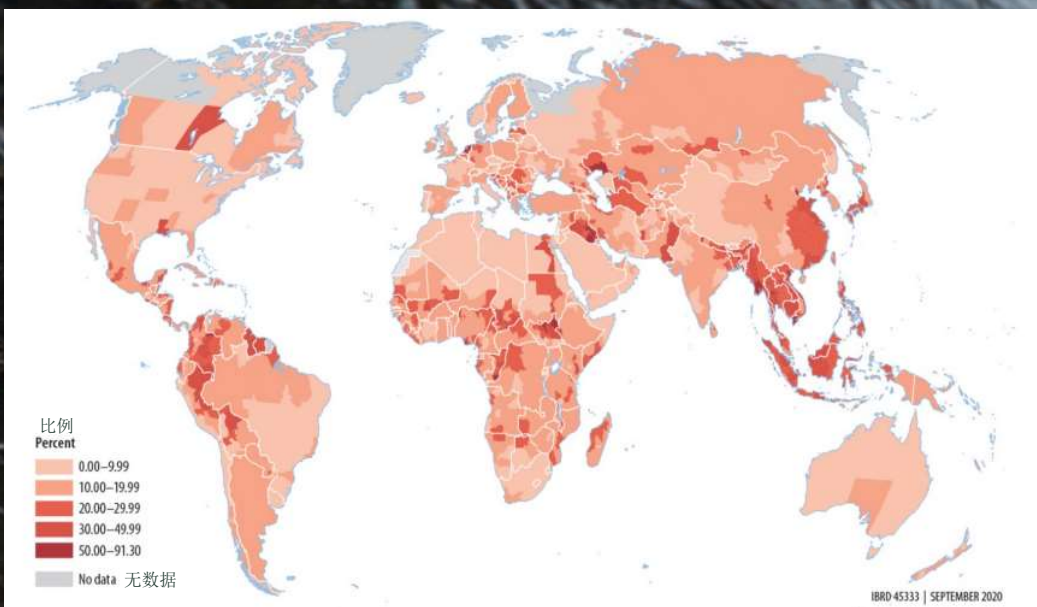
>65%
 of economic losses
 caused by natural
 catastrophes over the past
 decade **were uninsured**



Source: Swiss Re Institute

Flood: Global Exposure & Protection Gap

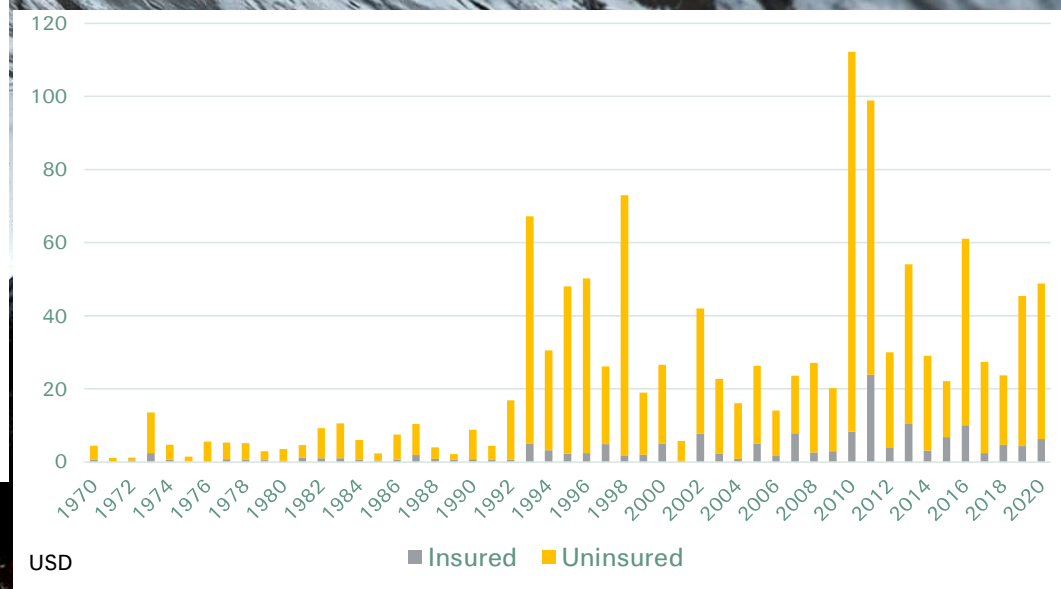
Population Exposure to Flood



Share of total subnational population exposed to significant floods (Percentage)

Source: World Bank Group
Climate Change Group & Global Facility for Disaster Deduction and Recovery, 2020

Flood losses: Insured vs Uninsured 1970 - 2020



Source: Swiss Re Institute
Remark: River floods and flash floods, no storm surge or precipitation by tropical cyclone.

Risk Partnership: SR innovative public sector risk transfer solutions footprint

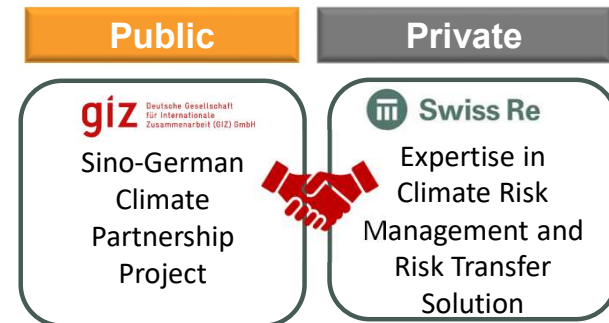


Understanding climate risks

Understanding Risks (I)

CRR Project by GIZ and Swiss Re in China

- **Climate Risk and Resilience (CRR) project:** Under the auspices of the China's Ministry of Ecology and Environment, GIZ lead the CRR project, with Swiss Re as the technical advisor, to conduct ECA study for pilot cities in China.



Risk Analysis, Risk Management and Knowledge Sharing on Risk Transfer Solution



Understanding Risks (II)

ECA study in CRR project

- **Economics of Climate Adaptation (ECA) study:** A comprehensive climate risk management and preparedness approach encompasses risk reduction, climate adaptation and ultimately risk transfer
 - Quantify the risk that climate poses to the economy
 - Identify and prioritize adaptation measures

- Capacity building, technical assistance and policy recommendations for adaptation strategy and preparedness planning for decision makers

- CRR pilot cities in China: Shenzhen, Haikou

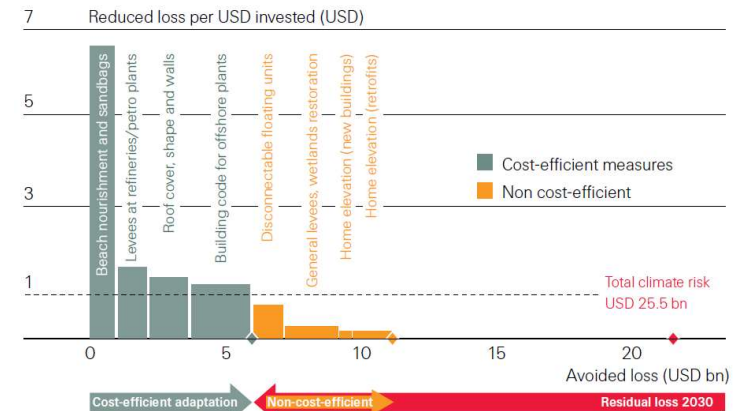
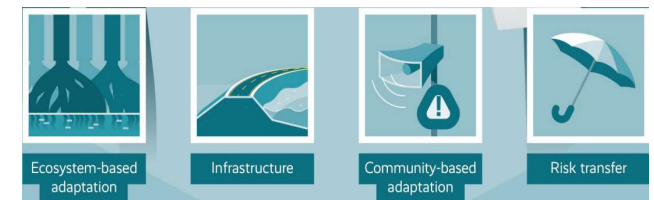


Illustration only

China: Natural Catastrophe Insurance

China's Central Gov't attaches great importance in building natural disaster insurance system

2013: Third Plenary Session of the 18th Central Committee of the CPC. *Decision of the Central Committee of CPC on Some Major Issues Concerning Comprehensively Deepening the Reform*

- Put forward "Improve insurance economic compensation mechanism and establish catastrophe insurance system"

2014: *Several Opinions of the State Council on Accelerating the Development of the Modern Insurance Service Industry*

- Put forward "establish a catastrophe insurance system and encourage local governments to explore effective protection models for typhoon, earthquake, landslide, debris flow, flood, forest fire and other disasters according to their risk characteristics."

2016: The State Council: *Report on the Work of the Government*

- Premier Li Keqiang stressed "establishing a natural disaster insurance system" again.

2017: The State Council: *Opinions on Advancing the reform of systems and mechanisms for disaster prevention, mitigation and relief*

- Put forward "give full play to the role of the market mechanism. Adhere to the principle of government promotion and market operation. Strengthen the positive role of insurance and other market mechanisms in risk prevention, loss compensation, recovery and reconstruction. Expand insurance coverage and improve the financial support system for disaster response". "Encourage local governments to explore effective catastrophe risk protection models in light of local disaster risk characteristics".

2021: *The 14th Five-Year Plan*

- Improve the national emergency management system. Strengthen the system for guaranteeing emergency supplies. Develop catastrophe insurance, and improve our ability to prevent, mitigate, fight and provide disaster relief.

Government and Catastrophe Insurance

Challenges to government post-catastrophe event



Social governance

- Social stability
- Reduce the poverty cause by catastrophes



Financial management

- Insufficient disaster relief budget post event
- Difficulty in budget transfer and allocation among different fiscal accounts



Risk management

The need to improve the country's overall disaster emergency management system.

Benefit of catastrophe insurance to government



Financial support

- Insurance payment post event, to ease the uncertainty of transfer payments and donations.
- Insurance payouts faster than the turnaround time for most other sources of disaster funds.
- Financial leverage to reduce the pressure on fiscal budget post event.



Social governance

- More scientific social governance and financial management.
- Insurance companies participate in post-disaster loss assessment and other work to share the gov't burden.



Risk management

- Insurance companies are integrated in the country's disaster prevention and mitigation mechanisms.
- The technology adopted by insurance companies help improve overall risk management level.

Major Catastrophe Insurance Projects in China

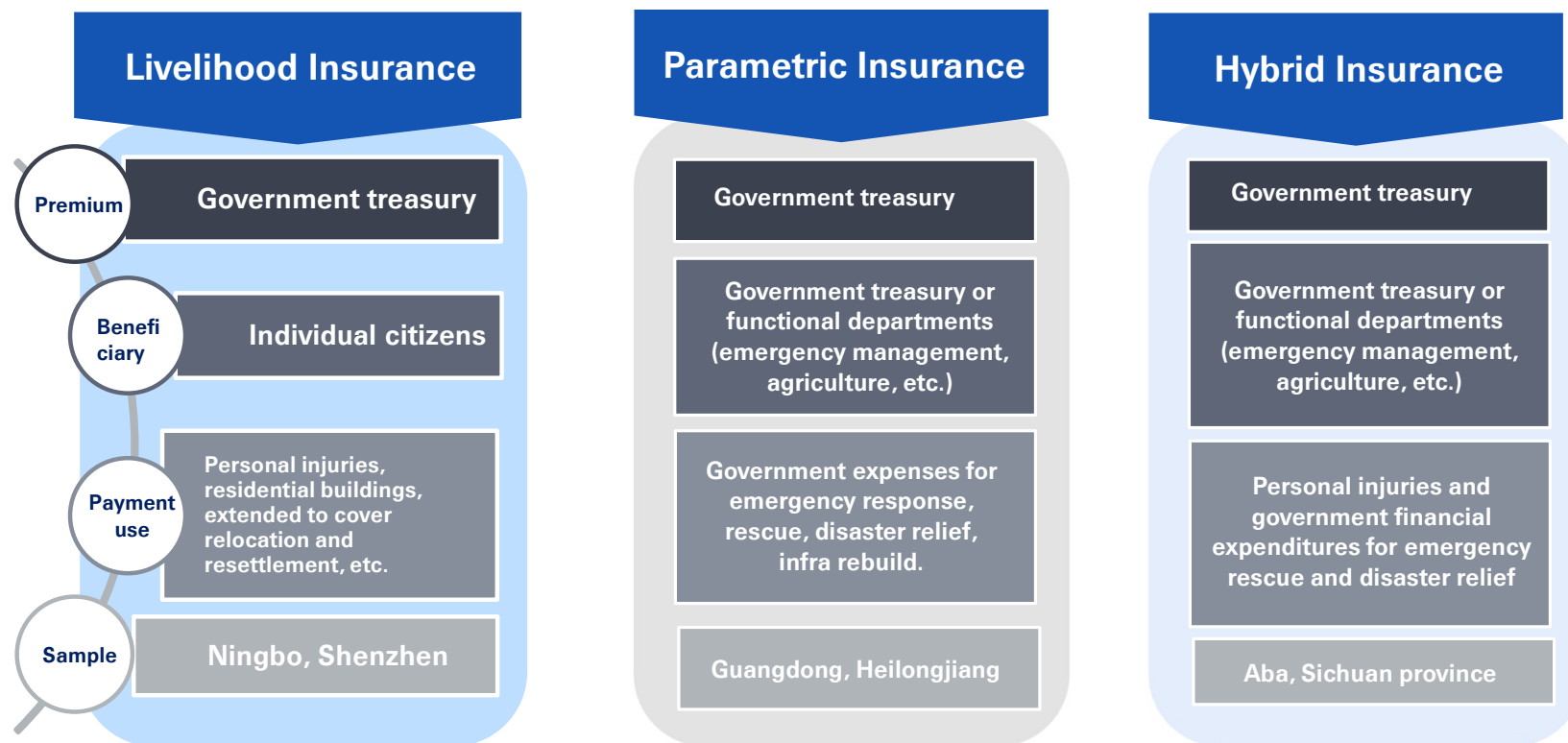
(Incomplete statistics)



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Place	Pilot projects that Swiss Re has participated in
Guangdong	Parametric insurance covering typhoon & rainfall
Taizhou	Parametric Cat-Net insurance
Hunan	Traditional insurance
Four cities in Hubei province	Wuhan: parametric insurance covering rainfall The other three cities: traditional insurance
Shanghai	Traditional insurance
Ningbo	Innovative insurance
Xiamen	Traditional insurance
Yinchuan	Earthquake casualty insurance
Dali Bai Autonomous Prefecture	Parametric insurance covering earthquake
Aba Tibetan and Qiang Autonomous Prefecture	Parametric insurance covering earthquake and other secondary disasters
Shenzhen	Traditional insurance
Two cities in Hainan province	Traditional insurance
Shandong	Traditional insurance

Major types of catastrophe insurance in China



Case Study: Guangdong, Sichuan

Guangdong: Parametric Catastrophe Insurance

Insured: Municipal gov't of cities in Guangdong province

Coverage: Payments to local authority's public fiscal system, and to be used as the contingency capital for the gov't to deal with post-disaster relief and infrastructure repair and rebuilding.

Perils: Typhoon, Rainfall

Limit: USD 300mio (10 cities aggregated)

Product design:

- Parametric insurance product
- Typhoon: wind track and speed
- Rainfall: aggregated rainfall millimeters of certain days (e.g. 200mm for 3 days)

Sichuan: Hybrid Catastrophe Insurance

Insured: County gov't in Sichuan province

Coverage:

- Personal injury or death
- Payments to local authority's public fiscal system, and to be used for post-disaster relief and infrastructure repair and rebuilding.

Perils: Earthquake, Rainfall, landslide, etc.

Limit: USD 3mio (1 county)

Product design:

- Parametric insurance for earthquake, rainfall, landslide
- Indemnity-based insurance for other risks

Technologies and innovations

Innovative Water Peril Solutions

Risk insights & risk transfer solutions to help address gov't fiscal resilience objectives

Guangdong: Precipitation

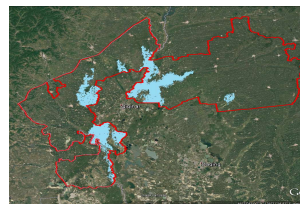
- Insured: Municipal Finance Bureau
- Parameter: **precipitation data**
- Payment usage: emergency response and post-disaster reconstruction



weather stations overview

Heilongjiang: Flood Print

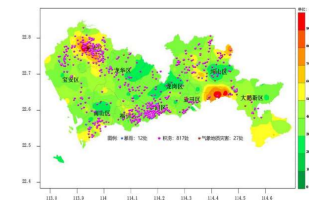
- Insured: Provincial Finance Bureau
- Parameter: flood event **footprint captured by satellite image** data
- Satellite: e-GEOS, radar independent of cloud cover
- Technical partner: Chinese Academy of Science



Flood event footprint sample

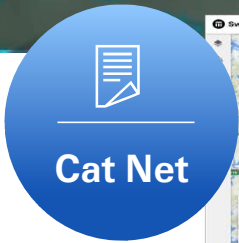
In development: Urban flood

- Leveraging Smart Water Resource project in many cities
- Parameter: **water depth** observed by water gauges
- In development phase with technical partner China Institute of Water Resource and Hydro Research CIWHR

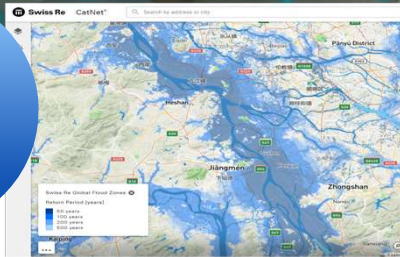


Heavy rainfall event monitor:
water logging + precipitation

Technology plays an ever greater role in Nat Cat risk management

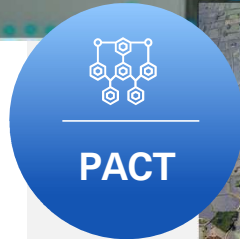


Cat Net

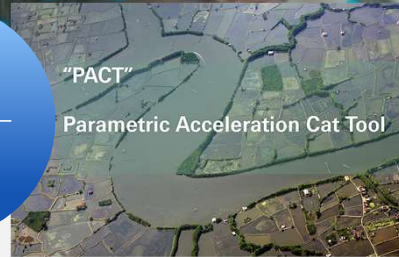


CatNet® online catastrophe atlas of Swiss Re

- Industry leading, global and comprehensive hazards database, including perils such as flood, typhoon, earthquake
- Additional layers on insurance information, historical claims and catastrophe
- Visualization and data support for risk assessment of specific risks or insurance portfolios.

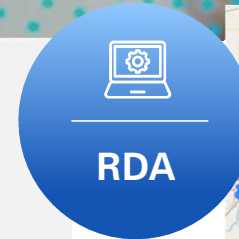


PACT

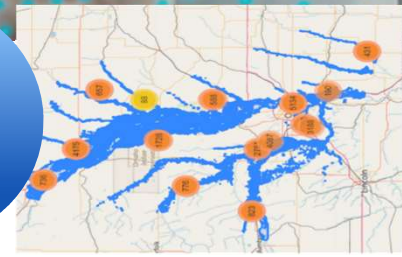


PACT, a platform that provides pricing and designing of parametric products for government (especially for districts and counties)

- Product design and pricing
- Typhoon module: parametric product with tailor-made structure
- Rainfall module: parametric product with named weather station and tailor-made structure



RDA



CatNet based, **RDA** is a rapid loss assessment tool, for timely satellite imaging-based assessment integrated with insurance information

- Flood footprint based on satellite images
- Identify the affected area, perform risk assessment, produce damage map.
- Loss estimation based on risk exposure to support claims and reserve management.



We make the world
more resilient.

Thank you!

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