Swiss Re

New approaches to disaster risk financing: the role of insurance

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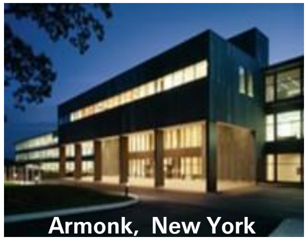
Introduction to Swiss Re

Swiss Re "at a glance"

Swiss Re is a highly diversified, global **leader in wholesale reinsurance, insurance and risk transfer solutions.**

Founded in Zurich in 1863 the company has 150 years of experience.



We combine our capital strength and knowledge to meet our clients' needs both through traditional and innovative offerings in P&C and Life & Health.

Our financial strength is currently rated:
Standard & Poor's: AA- (stable); Moody's A1 (positive); A.M. Best: A+ (stable)

Key statistics (USD billions)	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**
Total revenues:	31.0	28.8	28.0	33.6
Net income:	0.5	0.9	2.6	4.2
Shareholders' equity:	25.3	25.3	29.6	34.0

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Swiss Re's contribution to managing risks

Nat cat and man-made large claims

USD m	FY **2011**	**Total** est. **net claims**
Earthquake New Zealand	February	1 292
Earthquake Japan	March	955
Floods in Thailand	October	696
	FY **2012**	**Total** est. **net claims**
Earthquakes Northern Italy	May	140
Droughts USA	June	50
Typhoon Bolaven	August	32
Alberta Hailstorms	August	30
Hurricane Sandy	October	900
Grounding Costa Concordia	January	93
Offshore fire loss	January	21
Explosion at chemical plant	March	72
Fire loss	April	30
Explosion at chemical plant	April	27
Fire loss	September	32
	FY **2013**	**Total** est. **net claims**
Satellite loss	February	32

- 2011 was an extraordinary year: Swiss Re paid more than USD 3bn for large claims
- 2012 was within expected range: Swiss Re paid more than USD 1.5bn for large claims, most notably:
  - Hurricane Sandy,
  - Earthquakes in Italy,
  - Grounding of Costa Concordia

Swiss Re – A leading partner for the public sector

- First dedicated public sector team in the reinsurance industry
- Over 40 closed transactions since 2006
- Manage insurance, reinsurance and capital markets and all perils (disasters, weather, longevity, etc)
- Global footprint
- Pioneer in emerging and industrialized markets

The Caribbean Catastrophe Risk Insurance Facility USD 111m Reinsurance Placement Lead Reinsurer 2010	*Alabama State Insurance Fund* Parametric Insurance Solution Sole Structurer & Insurer 2010	*Tamil Nadu Health Insurance Pool* Microinsurance Program Multi-Year Reinsurance Solution Lead Reinsurer 2010	*Government of Vietnam* Agricultural Insurance Scheme Sole Reinsurer 2010
UBF Seguros Brazilian Agriculture and Surety Insurance Company Lead Investor 2010	*Beijing Municipal Government* Multi-Peril Agriculture Cover Stop Loss Reinsurance Program Lead Reinsurer 2009	*Turkish Catastrophe Insurance Pool* Earthquake Cover Euro 1.4bn Placement Ongoing Reinsurance Support Since 2001 inception	*United Mexican States and The World Bank* USD 290m At-Risk Variable Rate Notes Sole Counterparty 2009
County of Berkshire Pension Fund USD 1.6bn longevity swap Sole Counterparty 2009	*North Carolina Joint Underwriting Association* USD 200m At- Risk Variable Rate Notes Joint Bookrunner 2009	*The World Bank International Development Association* USD 5m Drought Derivative Sole Counterparty 2009	*Agroasemex* Parametric Vegetation Cover USD 7.5m Reinsurance Placement Co-lead Reinsurer 2008
European Bank for Reconstruction and Development (CNPP – New Safe Confinement) USD 110m Professional Liability Cover Co-lead Reinsurer 2008	*Government of Luxembourg Ministry of Environment* Certified Emission Reduction Credits Sole Structurer 2008	*Providence of Alberta, Canada Forest Protection Division* Wildfire Suppression Cost Cover CAD 100m Reinsurance Placement Co-lead Reinsurer 2006	*United Mexican States CAT-Mex, Ltd.* USD 160m At-Risk Variable Rate Notes Sole Bookrunner 2006

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The need to close the financial gap

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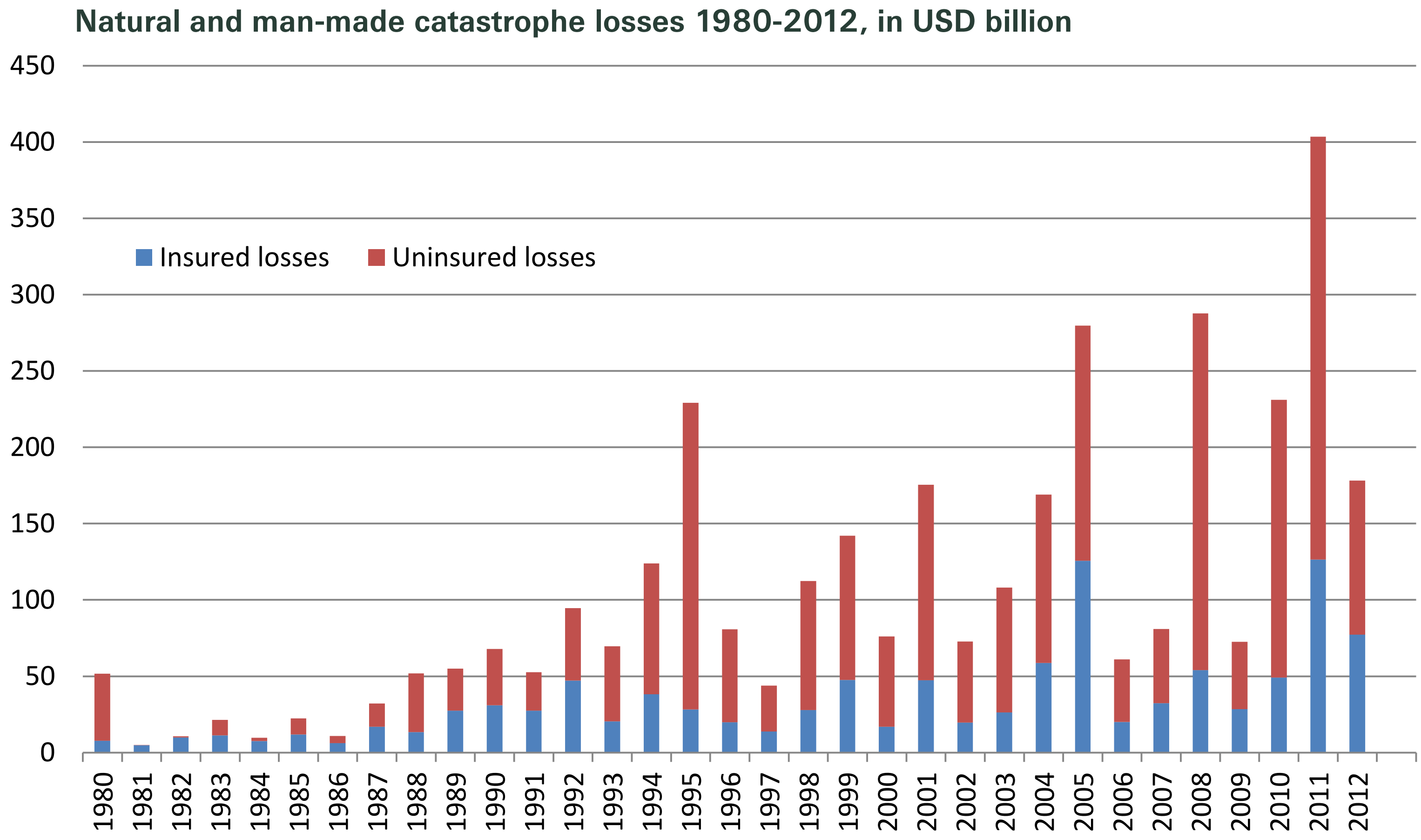
Massive gap between total and insured losses shows insurance potential



Source: ER&C, *sigma* catastrophe database

Economic costs of major disasters: big differences

Year/event	Victims	Insured losses, USD bn, 2012 prices	Economic losses, USD bn 2012 prices	Insured loss as % of economic loss	Economic loss as % of GDP
2011: EQ Japan	19 135	36	214	17%	3.6%
2011: EQ New Zealand	181	12	15	80%	9.6%
2011: Flood Thailand	813	12	31	40%	8.8%
2010: EQ Chile	562	8	32	27%	14.6%
2010: EQ Haiti	222 570	0.1	8	1%	129%
2010: Flood Pakistan	1 985	0.47	7	17%	3.9%
2005: Hurricane Katrina	1 836	76	164	46%	1.3%

Source: Swiss Re Economic Research & Consulting

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Disasters place a significant burden on the public sector and individuals alike

- Prevention and mitigation efforts must be first priority, but no country can fully insulate itself against extreme natural disasters.
- The brunt of economic losses from natural disasters end up with individuals and governments.
- Government budgets are impacted by:
  - Primary effects, e.g.
    - immediate expenses for emergency relief
    - costs for rebuilding public infrastructure
    - loss of capital and durable goods
  - Secondary effects, e.g.
    - lower economic growth
    - lower tax and non-tax revenues
    - budget deficits, debt increases
    - higher inflation; exchange rate movements

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Creating a powerful and sustainable Disaster Risk Financing Mix

Financing instruments	Financing mix	Considerations

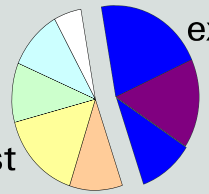
Ex-post financing

- Budget contingencies
- Donor assistance
- Budget reallocation
- Debt
- Tax increase

Ex-ante financing

- Reserve fund
- Contingent financing
- Risk transfer

A comprehensive and sustainable natural disaster risk financing mix combines both ex-post and ex-ante measures



- Funding requirements after a 50, 100 or 200 year event
- Current condition of the economy, the state budget and debt levels
- Potential conflicts with other national priorities in terms of fund allocation
- Costs and availability of the various financing tools
- Impact of the various financing tools on future government elections as these have different degree of popularity within the constituency

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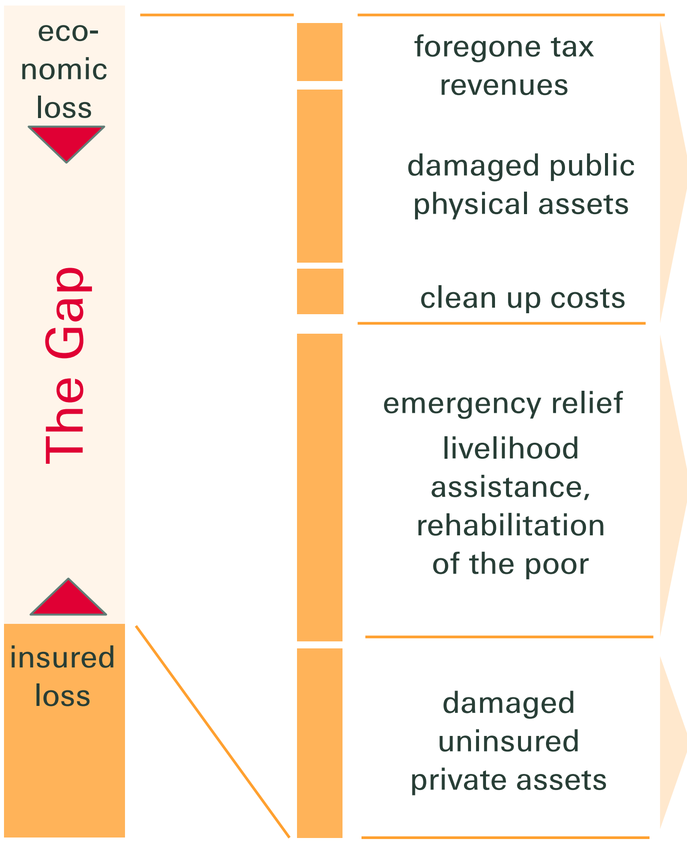
Closing the Gap: Including pre-event risk financing instruments on all levels

Macro, pooling, and micro



Solution type	Description
Macro	risk transfer solutions for (sub)sovereigns
Micro	simplified products distributed via aggregators such as MFIs, NGOs, and corporates
Pooling	setting up of insurance schemes and pools to increase insurance penetration

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Insurance pools: a way to increase insurance penetration

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The Turkish Catastrophe Insurance Pool (TCIP)

Solution features

- Payments used to offset the economic costs of earthquakes
- Insured peril: Earthquake
- Insured assets: Private residential dwellings
- Funding: Compulsory premiums paid by homeowners; policies distributed by Turkish non-life insurers
- Checkpoints: land register, utility services
- Effect: Significantly increased penetration of earthquake coverage in Turkey
- Policy coverage:
  - Limit of TLY 140,000
  - 2% deductible
  - Additional cover can be bought from private insurers

Involved parties

- Insurance supplier: TCIP/DASK, a legal public entity
- Operational pool manager: Eureko Sigorta
- Distributors: 30 local insurance companies
- Reinsurers: Swiss Re and other overseas reinsurers

Comparison of different natural catastrophe insurance schemes in Europe and the US

	Characteristics	Pro's	Con's
France	Government programme for flood, earthquake and other natural hazards, compulsory for all homeowners buying fire and theft insurance; uniform rates	Broad participation, high insurance penetration.	Rates not risk-based, no incentives for prevention.
Germany	Voluntary supplement to building and content insurance for flood, earthquakes, and other natural perils.	Risk-based rates, detailed flood risk maps.	Low insurance penetration (in many regions below 10%).
UK	Insurers provide flood insurance bundled with other perils as part of standard property insurance. Gentlemen agreement with government.	High insurance penetration, risk-based rates partly possible.	Voluntary agreement ends in 2013. Unclear future.
US	Federal government provides optional flood insurance cover, policies distributed through private insurers.	Eligibility based on prevention measures of town.	Rates inadequate and not risk-based. Scheme is insolvent.
Switzerland	Mostly compulsory cover for buildings for all natural perils excl. EQ. Pool among private and state insurers, state monopoly in some cantons.	Insurance penetration close to 100% for buildings. Efficient.	No competition in case of state monopoly.

Macro insurance solutions to stabilize the government budget

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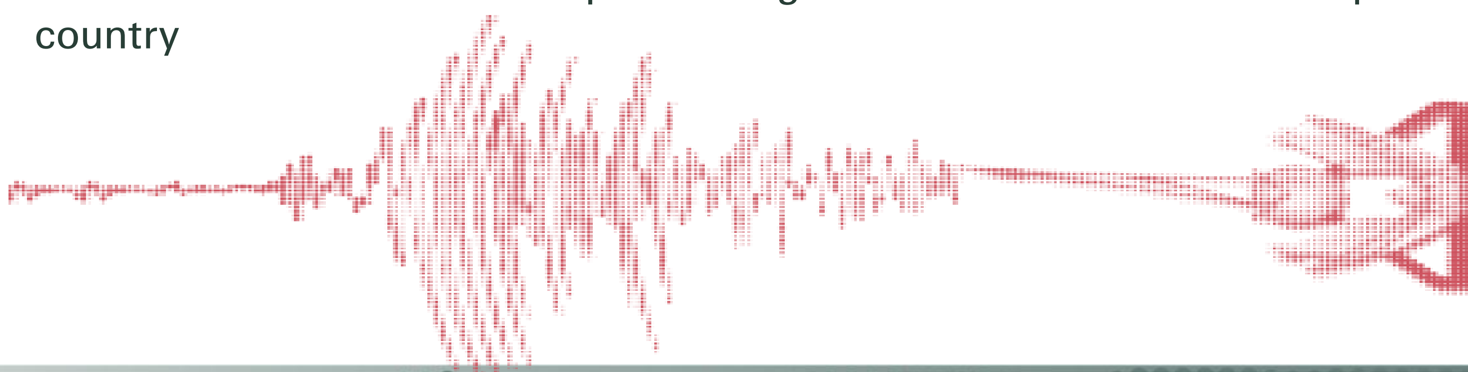
Parametric insurance – innovative solutions for the public sector

Parametric or index covers pay out a pre-determined amount in case of a natural disaster exceeding certain thresholds (e.g. magnitude of earthquake or windspeed).

Advantages:

- Claims are paid shortly after the event, once official parameters of the event (e.g. magnitude, windspeed) are available
- Unlike insurance/reinsurance, there is no need to evidence claims or prove losses
- The received funds can be used by the government to provide relief to the affected population and/or to rebuild infrastructure. The payout protects the government's revenue gap and thus ensures budget planning certainty
- Innovative instrument sends positive signal to the stakeholders of a specific country



Caribbean Catastrophe Risk Insurance Facility (CCRIF)

Solution features

- The CCRIF offers parametric hurricane and earthquake insurance policies to 16 CARICOM governments
- The policies provide immediate liquidity to participating governments when affected by events with a probability of 1 in 15 years or over
- Member governments choose how much coverage they need up to an aggregate limit of USD 100 million
- The mechanism will be triggered by the intensity of the event (modelled loss triggers)
- The facility responded to events and made payments:
  - Dominica & St. Lucia after earthquake (2007)
  - Turks & Caicos after Hurricane Ike (2008)
  - Haiti , Barbados, St. Lucia, Anguilla and St. Vincent (2010)

Involved parties

- Reinsurers: Swiss Re and other overseas reinsurers
- Reinsurance program placed by Aon Benfield Ltd.
- Derivative placed by World Bank Treasury

Alabama – First parametric cover for a government in an industrialized country

Solution features

- Insured peril: Hurricane
- Payments to offset economic costs of hurricanes
- Trigger type: Disaster occurring within a defined geographic area ("box") along coast ("cat-in-the-box")
  - Trigger based on wind speed of hurricane eye as it passes through pre-determined box
  - Payout in as little as two weeks
- Time horizon: July 2010 – July 2013
- First parametric catastrophe risk transfer for a government in an industrialized country

Involved parties

- Insured: State Insurance Fund of Alabama
- Swiss Re: Lead structurer and sole underwriter

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MultiCat Mexico - funding for immediate relief efforts after disasters

Solution features

- Insured perils: Earthquake and hurricane
- Payments to be used for immediate emergency relief after a disaster
- Parametric catastrophe bond: USD 315 million
- Trigger type: Index
  - Earthquake: physical trigger (quake magnitude)
  - Hurricane: physical trigger (barometric pressure)
- Time horizon: October 2012 – November 2015
- Renewed cat bond launched through the World Bank's MultiCat facility and third cat bond for Mexico

Involved parties

- Insured: Fund for Natural Disasters (FONDEN) of Mexico
- Reinsured: AGROASEMEX S.A.
- Arranger: World Bank Treasury
- Swiss Re: Co-lead manager and joint bookrunner

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Newly launched Pacific Disaster Risk Insurance Facility

Solution features

- First-of-its-kind sovereign catastrophe risk transfer in the Asia Pacific region
- The PDRIF offers parametric earthquake (including tsunami) and tropical cyclone insurance policies to 5 pilot Pacific Island countries: Marshall Islands, Samoa, Solomon Islands, Tonga and Vanuatu
- The policies provide immediate liquidity to participating governments in the aftermath of a disaster with an approximate probability of 1 in 15 years
- Insurance coverage provided to the 5 Pacific Island countries is about USD45mn
- Similarly to CCRIF, the swap payout will be triggered by the intensity of the event (modelled loss approach)

Involved parties

- World Bank, ADB, Japan MoF
- Derivative placed by World Bank Treasury

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Parametric solutions offer three key benefits for governments

1. Budget protection for the government for otherwise difficult to insure risks

2. Rapid payment

3. Flexibility in the use of the proceeds

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Microinsurance to protect low-income households

Case study Haiti: The Microinsurance Catastrophe Risk Organization (MiCRO)

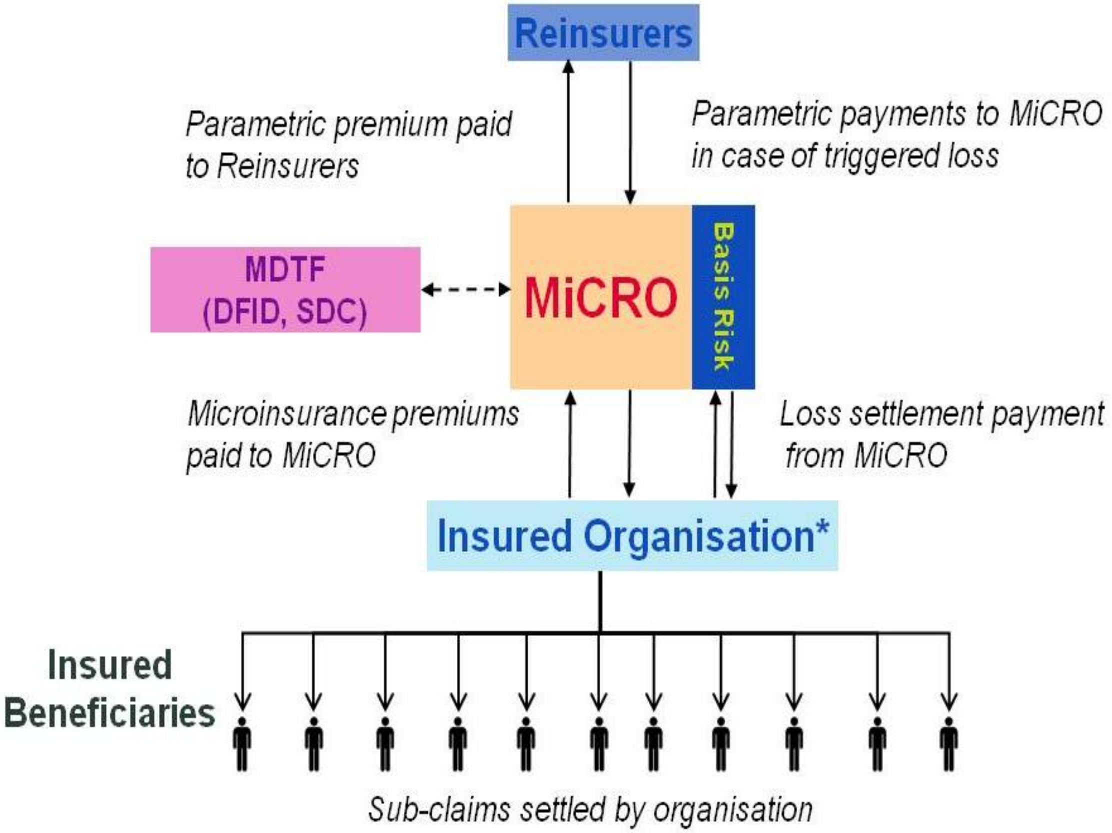
Solution features

- Insured perils: Hurricane, earthquake and rainfall
- Payments are made to microfinance borrowers post-disaster to reduce their loans and provide emergency cash
- Parametric and basis risk policies are distributed through a local Haitian microfinance institution, Fonkoze
- Trigger: Index measured at Fonkoze branches in Haiti
- Basis risk absorbed by new donor funded company, MiCRO
- Inception: March 2011

Background information

- Haiti is a nation that is susceptible to catastrophes and is unprepared for the costs of response
- Prior to the setup of MiCRO, Fonkoze's clients bore 100% of natural disaster risk
- MiCRO was named "Company Launch of the Year" at The Review magazine's annual Worldwide Reinsurance Awards in September 2011.

Case study Haiti (Ctd.): The Microinsurance Catastrophe Risk Organization (MiCRO)



Conclusion: effective new insurance solutions exist

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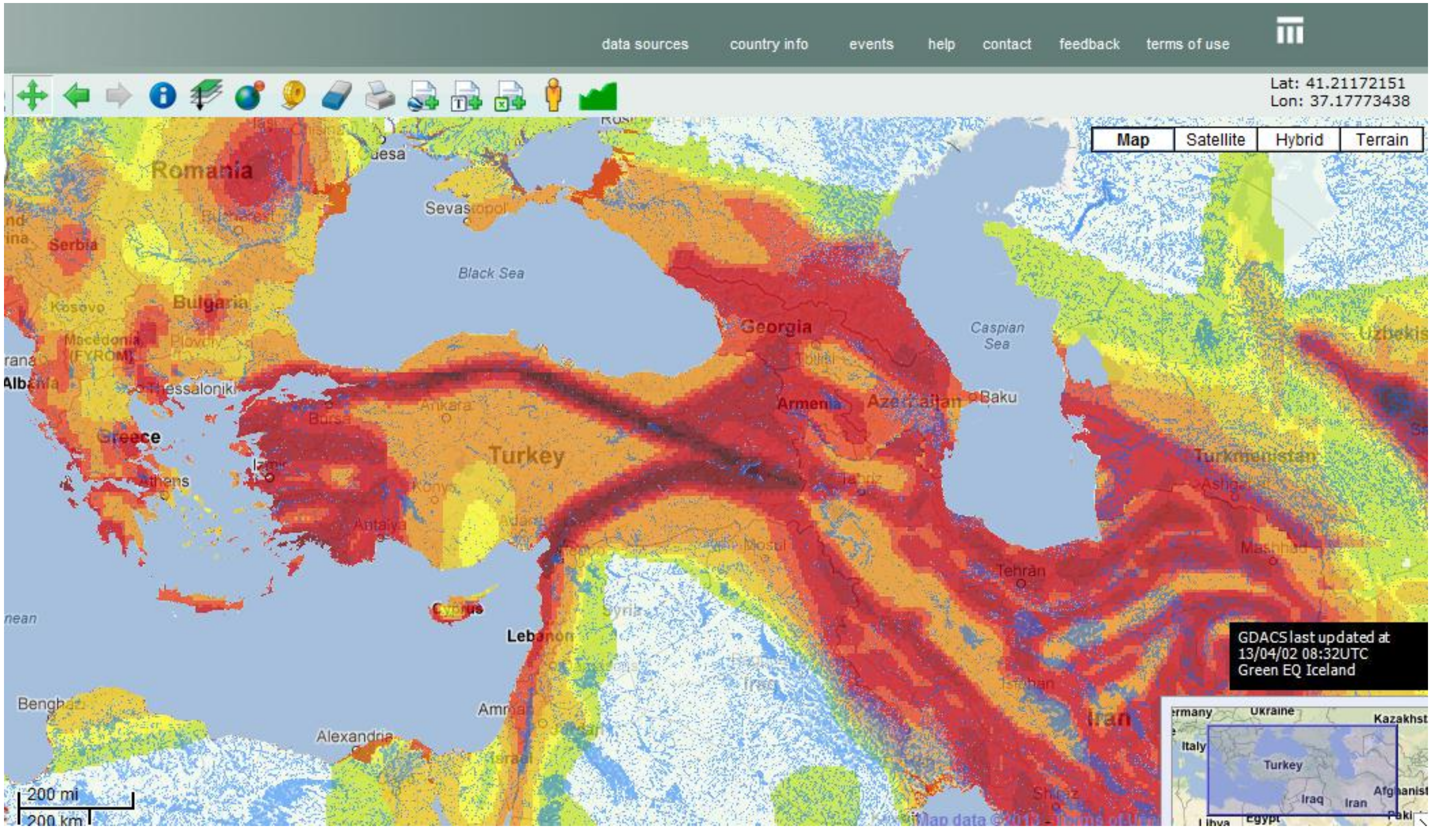
Achieving **financial resilience** is a critical component of effective **Disaster Risk Management.**

Source: G20/OECD Disaster Risk Assessment and Risk Financing

Effective insurance solutions are needed for this highly exposed region



www.swissre.com/catnet

Innovative insurance solutions exist to close the protection gap

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- Natural catastrophes are a **massive burden on public budgets**
  - on average only 30% of total economic losses are insured
  - wind is fairly well covered, but a huge protection gap exists for floods and earthquakes
- To close the protection gap, the **public and the private sector** must work closely together
  - Governments' primary role is to set a **regulatory framework** which enables free market mechanisms and risk-adequate premium rates, and to facilitate the development of an insurance market.
  - **Insurance pools** exist in many different forms, **can be effective or necessary** to make certain disaster perils insurable, and can be reinsured. No size fits all, different schemes can work.
  - **Innovative parametric insurance solutions** allow Governments to finance their disaster expenses before an event occurs, thereby stabilizing the government's budget.

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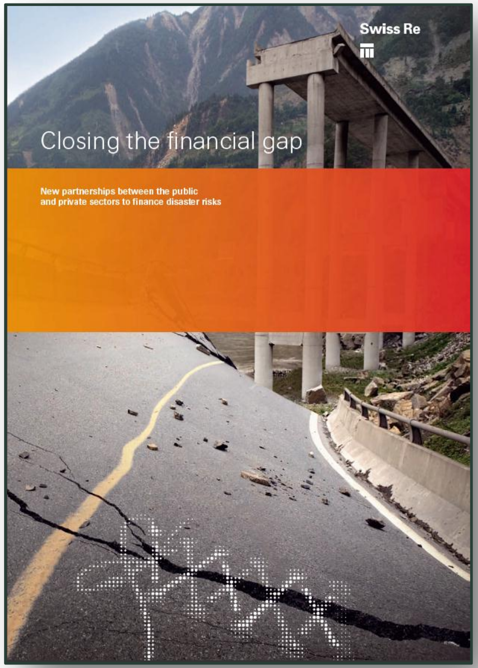
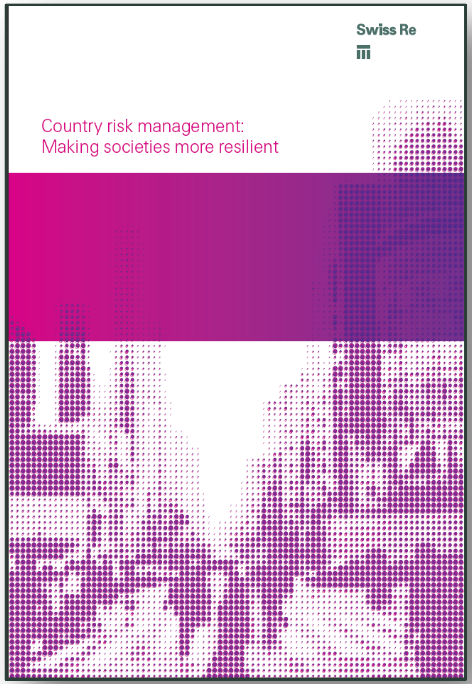
Advantages of (re)insurance solutions

- Efficient way to cope with the financial consequences of natural catastrophes
- Guaranteed access to required funds for recovery, up to agreed cover limits
- Speedy delivery, especially with innovative instruments such as parametric solutions
- Pre-determined premium allows for budget planning certainty, particularly in multi-year contracts
- No payback obligation (in contrast to loans)
- Reduction of a country's contingent liabilities to acceptable levels (positive implications for sovereign rating and currency)
- Limits the pressure to divert own funds from other projects to affected areas

Appendix

Swiss Re publications





Thank you

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