# THE ROLE OF PARAMETRIC INSURANCE TO BUILD RESILIENT ECONOMIES

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VISION:
We make the world more resilient.

MISSION:
Together, we apply fresh perspectives, knowledge and capital to anticipate and manage risk.
That's how we create smarter solutions for our clients, helping the world rebuild, renew, and move forward.

# Swiss Re Group
## Overview

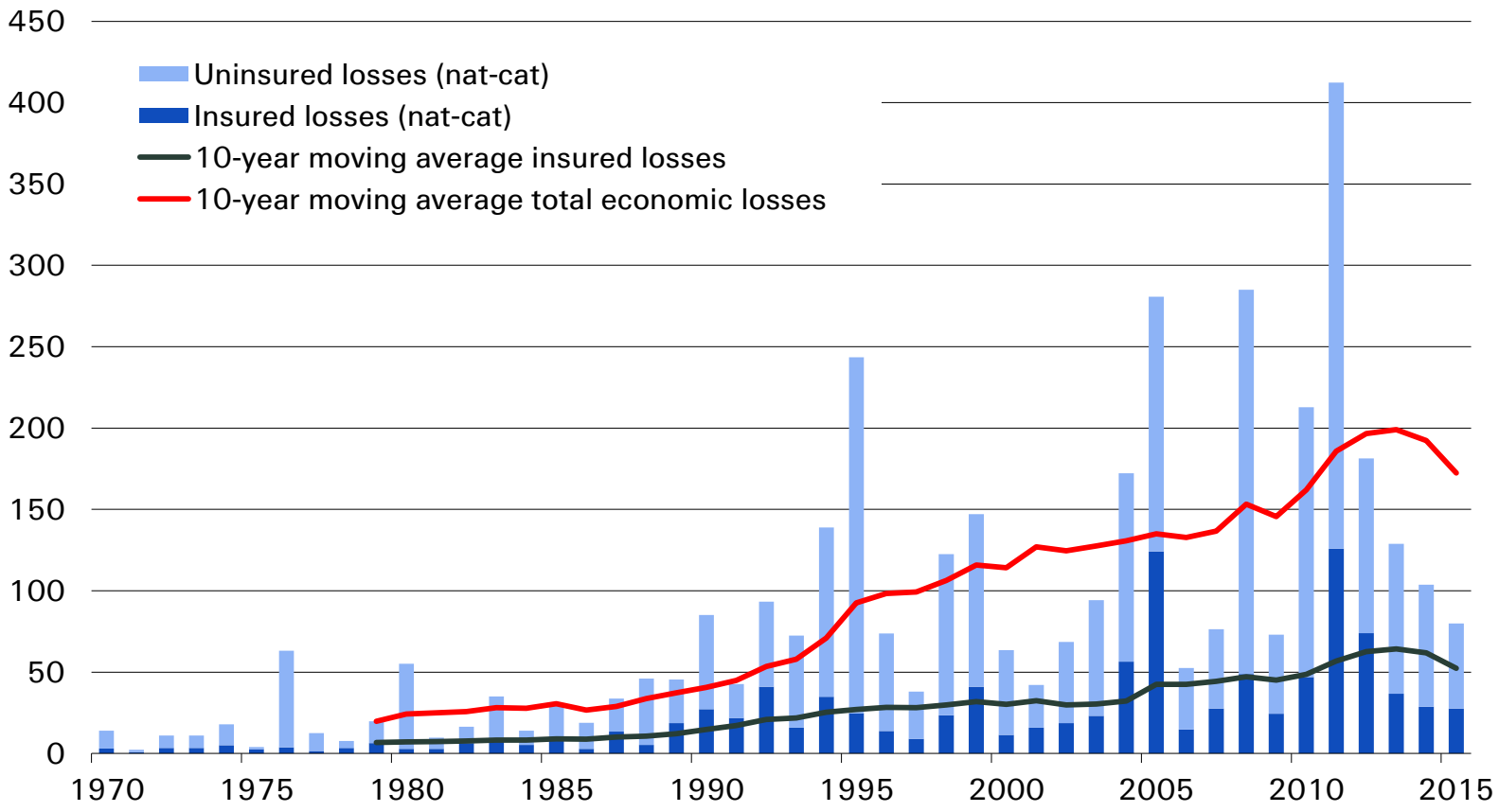

- Leading wholesale provider of reinsurance, insurance and other insurance-based forms of risk transfer.
- Global client base: insurance companies, mid-to-large-sized corporations, and public sector clients.
- Standard products to tailor-made coverage across all lines of business
- Deploys its capital strength, expertise and innovation power to enable the risk taking upon which enterprise and progress in society depend.

# Swiss Re's Global Partnerships team

- 1st dedicated public sector team in the reinsurance industry
- Over 200 bound transactions since 2011
- Global footprint
- Pioneer in emerging and industrialized markets

# The growing burden of uninsured losses

## Natural catastrophe losses 1970 – 2015 (in 2015 USD billion)



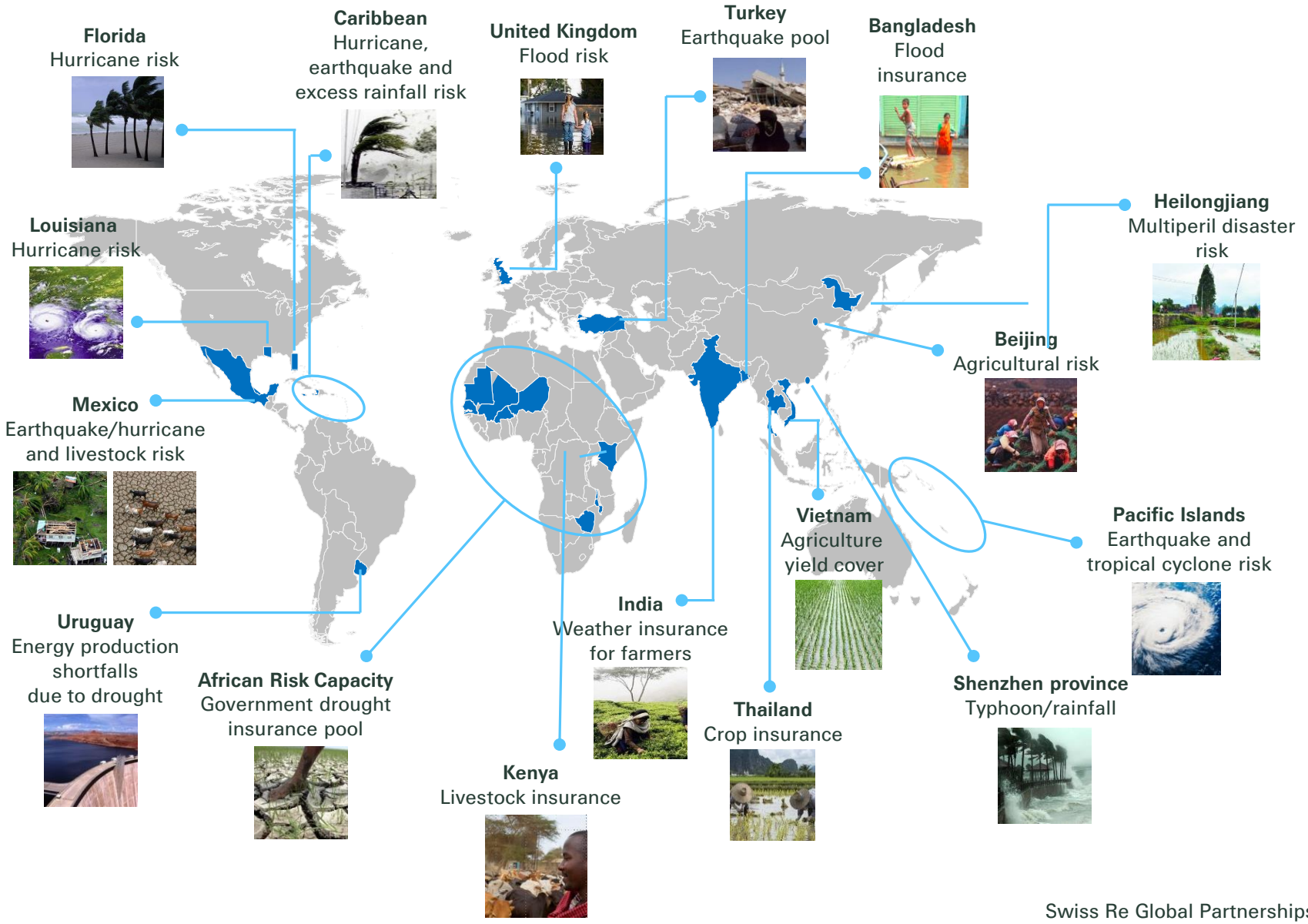

*Source: Swiss Re Economic Research & Consulting and Cat Perils.*

# Swiss Re's commitment
# 2014 UN Climate Summit in NYC

"By the year 2020, Swiss Re commits to have advised 50 sovereigns and sub-sovereigns on climate risk resilience and to have offered them protection of USD 10bn against this risk."

Swiss Re CEO
Michel Liès
23 September 2014

# Examples of innovative risk transfer solutions for the public sector



# How to close the protection gap

Protection gap

| Which risk? | Who carries the risk? | Risk transfer solution |
|---|---|---|
| Public physical assets<br>Emergency response costs<br>Foregone revenue | Governments | **Macro**<br>*Risk transfer solutions for (sub)sovereigns to cover their direct or indirect costs* |
| Uninsured private assets | Businesses, homeowners, farmers | **Pooling**<br>*Insurance schemes and pools to increase insurance penetration* |
| Livelihood assistance | Individuals | **Micro**<br>*Simplified products distributed via aggregators such as MFIs, NGOs, and corporates* |

# Advantages of (re)insurance and capital market solutions

- ✓ **Efficient way** to cope with 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

# Combined response by private and public sector

The effective reduction and financing of catastrophic risks requires a combined response by both private and public sector players

**Public sector**

- Political and legal power to set framework conditions that facilitate adaptive responses by individuals, the public and the private sectors
- Typically operates under significant financial constraints. As costs of disasters rise, the ability of governments to cope with natural disasters will be stretched even further

**Private sector**

- Financial resources but lacks the power to set up the required frameworks
- Broad geographical diversification which is required to absorb these risks in a cost-efficient way
- Valuable knowledge and experience in dealing with catastrophe risk management

# Case studies: Natural Catastrophes

# Case study UK: National flood insurance scheme (Flood Re)

**Solution features**

- The UK national flood insurance scheme (Flood Re) is a public private partnership between the UK government and the insurance industry.
- The objective is to provide affordable flood insurance to residential homeowners regardless of their flood exposure for homes build prior to 2009.
- Flood insurance prices are based on the insured's tax bracket, not exposure.
- Insurers can opt to cede flood risk to Flood Re at fixed price according to council tax bands.
- Flood Re is designed to manage UK's flood exposure up to a 200 year level which translates into a claims paying capacity of £2.1 bn.

**Involved parties**

- Legal framework: UK government
- Distribution: UK insurers
- Risk pool: Flood Re, a private reinsurance pool with a public function, capitalized by UK insurers
- Reinsurance of scheme: international reinsurance markets, Swiss Re is the co-lead reinsurer

FLOODRE

# Case study Mexico: MultiCat - 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 m
- 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

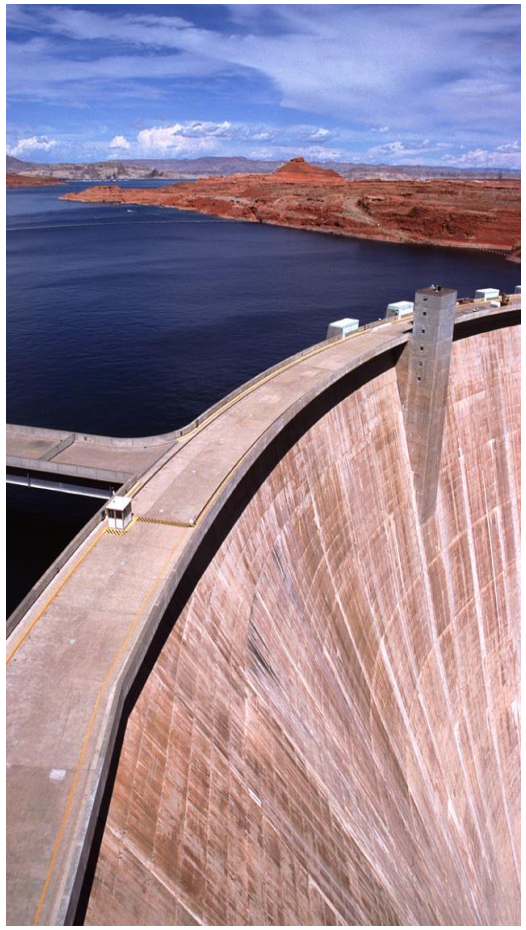
**Involved parties**

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

**Payouts to date**

- 2015: USD 50m after hurricane Patricia

# Case study Uruguay: Largest Energy Risk Transfer to Protect Against Drought Risk



**Solution features**

- Insured peril: Drought
- Payments to be used to purchase energy from alternative sources when drought conditions cause lack of hydro power
- Derivative contract: between UTE, Uruguayan state-owned hydro-electric power company, and World Bank Treasury. Risk is then placed in the market
- Payment mechanics:
  - Trigger: Level of rainfall monitored at weather stations
  - Settlement: Market price of brent crude oil
- Time horizon: January 2014– July 2015
- Transaction Size: USD 450 m
- Largest of its kind in the weather risk management market

**Involved parties**

- Client: UTE (Uruguayan state-owned power company)
- Arranger: World Bank Treasury
- Risk Takers: Swiss Re and Allianz

# Case study Caribbean:
# 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 m
- The mechanism will be triggered by the intensity of the event (modelled loss triggers)
- The facility responded to events and made payments:

**Involved parties**

- Reinsurers: Swiss Re and other overseas reinsurers
- Reinsurance program placed by Guy Carpenter
- Derivative placed by World Bank Treasury

**Payouts to date**

- 2010: Haiti USD7.7m (earthquake), Barbados USD 8.5m (hurricane), St. Lucia USD 3.2m (hurricane), St. Vincent & The Grenadines USD 1.1 (hurricane), Anguilla USD 4.2m (hurricane).
- 2008: Turks & Caicos USD 6.3m (hurricane)
- 2007: St. Lucia USD 418k (hurricane), Dominica USD 528k (hurricane).

# Case study Caribbean:
# CCRIF Excess Rainfall Coverage

**Solution features**

- In July 2014, the CCRIF added a third peril to their program by offering excess rainfall insurance to their members
- 12 countries purchased the coverage that triggers when the modelled loss exceeds the defined country threshold
- Loses are determined based on 2-3 day rainfall totals and the country exposure values
- Utilizes Kinetic Analysis Corporation's (KAC) high resolution data that is a compilation of satellite and ground observations
- Deductible for the CCRIF is USD 7 m and Swiss Re provides reinsurance with a limit of USD 35 m

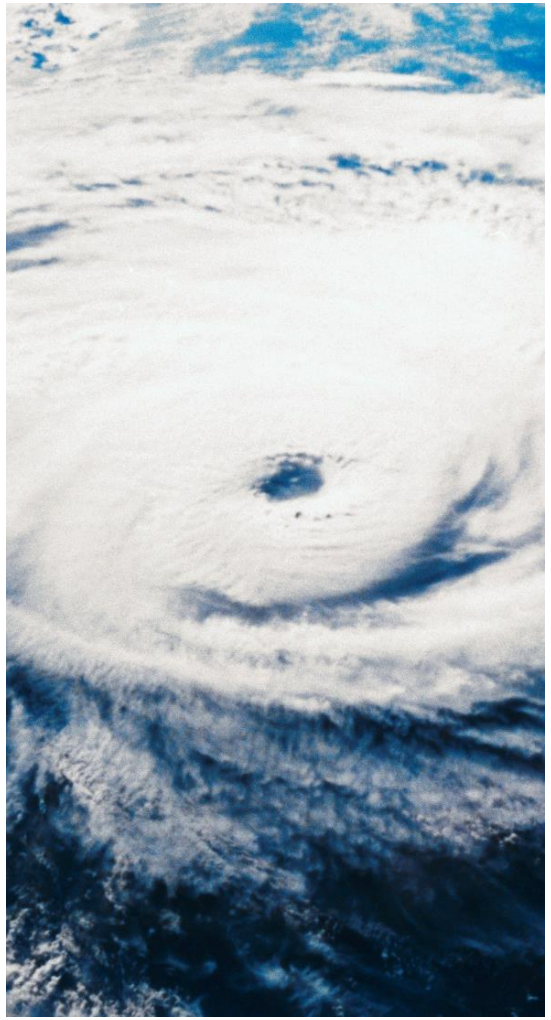
**Involved parties**

- Reinsurer: Swiss Re
- Product designed by: CCRIF, KAC and Swiss Re
- Calculation agent: KAC

**Payouts to date**

- Anguilla: USD 493k (Oct 2014) and USD 559k (Nov 2014)
- St Kitts and Nevis: USD1m (Nov 2014)
- Barbados: USD1.2m (Nov 2014)
- Belize: USD 260k (Aug 2016)

# Case study Asia-Pacific: Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)



**Solution features**

- First-of-its-kind sovereign catastrophe risk transfer in the Asia Pacific region
- The PCRAFI offers parametric earthquake (including tsunami) and tropical cyclone insurance policies to 5 pilot Pacific Island countries: Marshall Islands, Samoa, Tonga and Vanuatu and Cook Islands
- The policies provide immediate liquidity to participating governments in the aftermath of a disaster with an approximate probability of 1 in 10 years
- Insurance coverage provided to the 6 Pacific Island countries is about USD 40m
- 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

**Payouts to date**

- 2014: Kingdom of Tonga USD1.27m following typhoon Ian
- 2015: Vanuatu USD 1.9m following cyclone Pam

# Case study United States: 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

# Case study Turkey:
# Turkish Catastrophe Insurance Pool (TCIP)

**Solution features**

- Insured peril: Earthquake
- Payments used to offset the economic costs of earthquakes
- Insured assets: Private residential dwellings
- Funding: Compulsory premiums paid by homeowners; policies distributed by Turkish non-life insurers
- 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

# Case Study Bangladesh
# Meso-Level Index Based Flood Insurance

**Solution features**

- Index-based flood insurance product designed for those with lower incomes
- Pilot covers 1660 families from 14 villages in Bangladesh's Sirajganj district; premium per household BDT 824 (USD 10)
- Uses model generated flood data for payout calculation
- If catastrophic flood occurs, the programme will provide cash relief of up to approximately BDT 8000 (USD 100) per household

**Involved parties**

- Policyholder and implementing NGO: Manab Mukti Sangstha (Bangladesh)
- Lead: Oxfam GB, with funding by SDC (Swiss Agency for Development and Corporation)
- Insurer: Pragati Insurance Ltd., Reinsurer: Swiss Re
- Other partners: CIRM Advisory Services (India), Institute of Water Modeling (Bangladesh), and Palli Karma Sahayak Foundation (Bangladesh)

**Payout to date**

- 2014: total USD 250,000 to around 700 households

# Case studies: Agriculture

# Case study China: Heilongjiang provincial government multi-peril parametric disaster relief coverage

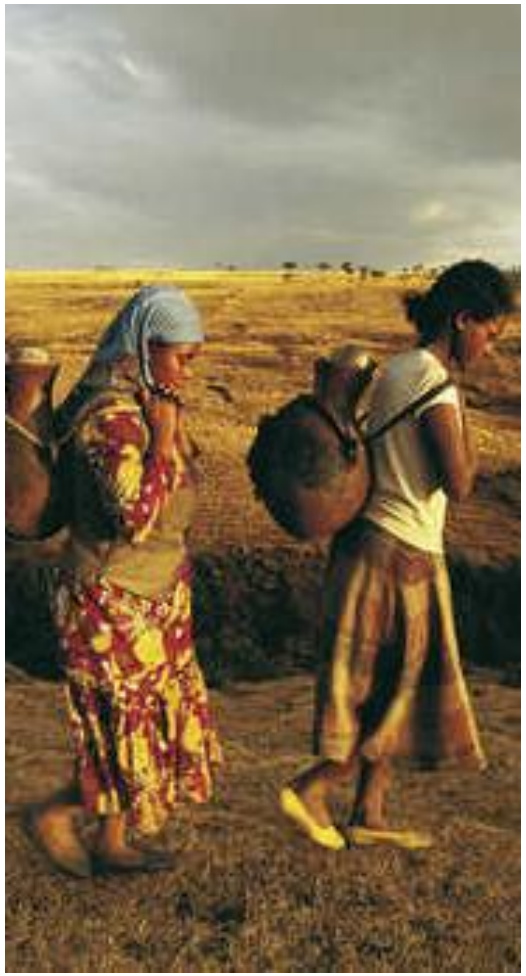
**Solution features**

- Provincial government insures its fiscal contingent liabilities for disaster relief in 28 counties who are classified as less poverty resilient.
- Payouts to be used for disaster relief and post disaster reconstructions of properties and infrastructure.
- Covered perils: Flood, excess rain, drought and temperature.
- Parametric triggers designed to reflect significant yield losses of agricultural crops based on satellite flood footprint index, precipitation index, drought (temperature & precipitation) and low temperature.
- Annual contract
- Sum Insured: USD 360m
- Swiss Re has 80% quota share reinsurance

**Involved parties**

- Reinsurer and product designer: Swiss Re
- Calculation agent: China Meteorological Agency
- Insured: Sunlight Agro Mutual Insurance

# Case study African Risk Capacity: Insuring governments' drought response costs



**Solution features**

- African Risk Capacity (ARC), through its insurance subsidiary ARC Insurance Ltd., is a sovereign insurance pool, which provides African governments with index-based macro drought cover (in a later stage also tropical cyclone and flood).
- It incepted in May 2014 with five countries and will expand over the next years to cover more countries (goal of 20 countries by 2019). The pool is capitalized with USD 200 million to offer cover of USD 30 million per country.
- To establish the payout rules, ARC has developed a software application, Africa Risk View (ARV), which translates satellite-based rainfall information into near real-time response cost estimates.
- Each country is required to customize and define its own insurance parameters and to submit a contingency plan, addressing the distribution of potential payouts to the affected population to ensure fast response.
- Certificate of good standing issued by ARC agency is a pre-requisite to participate in the insurance pool.

**Involved parties**

- Set up as Special Agency of the African Union with support from WFP, DfID, SIDA, SDC, Rockefeller Foundation, IFAD;
- Insurance entity ARC Insurance Ltd capitalized by DfID and KfW.
- Risk transfer to international insurers and reinsurers through broker.

**Payouts to date**

For 2014, Niger, Senegal and Mauritania received a combined payout of USD 26m, of which USD 16.5m to Senegal.

# Case Study Kenya:
# Kilimo Salama ("Safe Agriculture")

**Solution features**

- Currently insures 185,000 farmers in Kenya and Rwanda.
- Insurance designed for Kenyan farmers to cover inputs, such as seeds, fertilizer and chemicals; insured perils are extreme drought and excessive rainfall measured by independent data from automated weather stations
- Farmers buy the insurance together with inputs from stockists. Policy registration, premium and benefit payments are paperless transactions through the mobile platform "M-PESA".

**Involved parties**

- Agricultural Index Insurance Initiative of UAP Insurance and Syngenta Foundation with Swiss Re providing reinsurance and technical support. The IFC Global Index Insurance Facility is supporting the initiative
- Swiss Re joined from the beginning to provide risk capacity, underwriting expertise, structuring and claims support

**Payout to date**

- 2013: USD 160'000

# Case study Mexico:
# Satellite-based index insurance

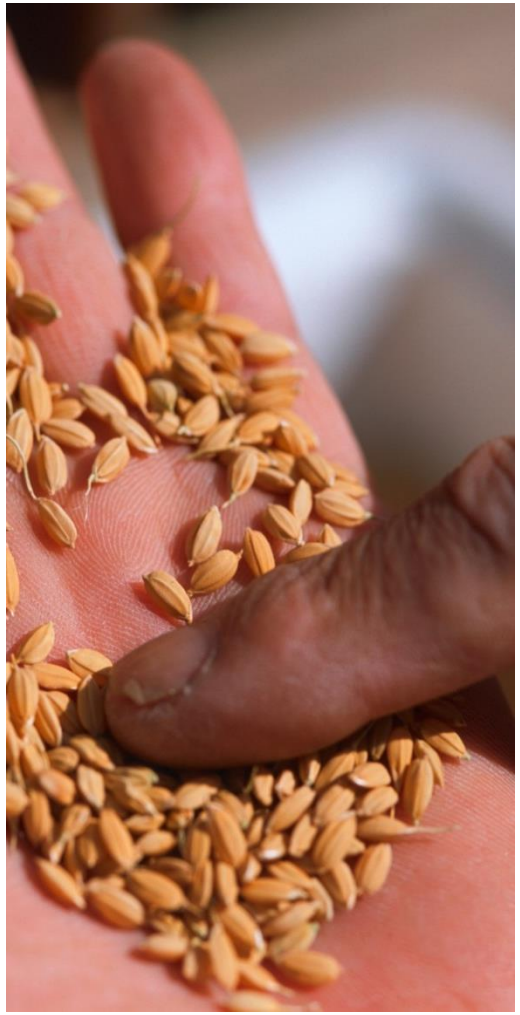
**Solution features**

- Insured peril: Drought
- Payment to provide economic relief to farmers for purchase of additional feed to maintain animals' minimum weight
- Parametric coverage; Vegetation Index data is available worldwide from the National Oceanic Aerospace Agency
- Available biomass is measured by a Vegetation Index calculated by using infrared and red spectral measurements from satellite images. If the data indicates the biomass has dropped below a certain threshold the payout is triggered
- The solution allows for rapid settlement of claims
- Transaction sponsored by the Government of Mexico

**Involved parties**

- Insured: Secretariat of agriculture (SAGARPA)
- Local reinsurer: Agroasemex, a Mexican state-owned reinsurance company
- International reinsurers: Swiss Re and others

# Case study: MAMDA Morocco



**Solution features**

- Nation-wide multi-peril crop scheme insuring Moroccan farmers against drought, hail, flood, wind and sandstorm for crops and leguminous plants. Current scheme in effect since 2011.
- Hybrid product between indemnity and index (area yield).
- Farmers subscribe on individual, voluntary and annually renewable basis and receive premium subsidy between 57.3% and 90% from the Government of Morocco.
- Subsidised premium highly varies (between USD ~2 and ~45), depending on the agricultural zone the farmer is located in and the size of insured land.
- Payment mechanics: if yield in specific community is below its 10-year average, state declares state of exception on communal level (mostly drought). Farmers declare claims, MAMDA inspects and coordinates settlement of claims.

**Involved parties**

- Client: MAMDA (Mutuelle Agricole Marocaine d'Assurances, Morocco's agricultural mutual insurance company)
- Reinsurers: International reinsurance markets, incl. Swiss Re
- State institutions (Ministry of Agriculture, Ministry of Economy and Finance) provide financing (state subsidies), coordinate, provide programme resources and declare claims

# Case study Kenya Livestock Insurance Program (KLIP): Livestock protection for smallholder farmers in Kenya

**Solution features**

- The Kenya Livestock Insurance Program (KLIP) is an innovative and scalable insurance solution to help pastoralists bring their cattle through severe times of droughts.
- The pilot was launched in October 2015 in the two counties of Wajir and Turkana and protects livestock of 5,000 households. After the successful pilot, From 2016 onwards KLIP will be extended across the whole country. KLIP is 100% funded by the Kenyan government, making it free for pastoralists who are registered under the Hunger Safety Net Program, and covers 5 tropical livestock units per household.
- KLIP works as an index-based livestock insurance scheme. The Normalized Difference Vegetation Index (NDVI) is an index of plant "greenness" or photosynthetic activity. Once a certain threshold is reached pastoralists insured under the scheme automatically receive a lump sum payout to provide livestock feed and water for their livestock which include cows, goats and camels. It is not about compensating for the death of livestock, but to protect the camel, cow or goat from the effects drought in the first place.

**Involved parties**

- The Ministry of Agriculture sets the framework and provides the premiums.
- Local insurer APA got mandated by the Government and entered into a consortium arrangement with other local insurance companies who are willing to participate.
- The International Livestock Research Institute (ILRI), funded by the World Bank, did the modelling work. A calculation agent will observe if a payout should take place.

# Gracias!

Por favor envía tus preguntas al grupo de Whatsapp:

*Taller Seguros Paramétricos – Guatemala*

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