

CCRIF Technical Workshop

Session 1: Recap on CCRIF



The Caribbean Multi-Hazard Risk Landscape

- Vulnerable to storms, tropical cyclones, flooding, landslides, earthquakes, etc.
- Intrinsic economic, environmental and social vulnerability, limited natural resource base, significant competition between different kinds of land use, a high level of dependence on major economic sectors that rely on the natural environment, fragile ecosystems, limited institutional capacity and low levels of insurance coverage
- High concentration of people and infrastructure located in the coastal zones, further increasing vulnerabilities to hydro-meteorological events and climate change
- Multi-hazard environment

Natural Hazards	Manmade Hazards	Biological/Health Related Hazards
<p>Meteorological and Hydrological:</p> <ul style="list-style-type: none"> • Tropical cyclones (tropical storms and hurricanes) • Rainfall, including severe rainfall events • Lightning • Extreme heat and increasing temperatures • Floods • Drought • Sea-level rise <p>Geohazards:</p> <ul style="list-style-type: none"> • Earthquakes • Mud Volcanoes • Tsunamis • Submarine volcanic eruptions <p>Environmental:</p> <ul style="list-style-type: none"> • Land degradation • Coastal erosion/Coastal inundation • Soil erosion • Landslides • Sahara dust • Sargassum • Coral reef degradation 	<p>Chemical:</p> <ul style="list-style-type: none"> • Oil spills • Transboundary movement of hazardous materials/ wastes <p>Technological</p> <ul style="list-style-type: none"> • Road, aviation, and nautical accidents • Industrial accidents • Infrastructure failures • Fires (bush and forest fires) • Burning dumpsites and landfills <p>Societal:</p> <ul style="list-style-type: none"> • Fires • Terrorism • Cybercrimes/cyber security gaps • Societal unrest 	<p>Biological:</p> <ul style="list-style-type: none"> • Human disease outbreaks, epidemics, pandemics • Animal (livestock) and plant (agricultural) epidemics • Other biological/physical hazards such as poisoning, eutrophication, air pollution



Financial Protection Against Natural Disasters

- Financial losses from natural disasters continue to rise, with developing countries and their low-income populations feeling the greatest effects.
- What are the costs of natural disasters in your country?
- Has it been increasing?
- Which hazards are causing the greatest impacts?
- What is your country's approach to Disaster Risk Financing

Direct and indirect financial impact of natural disasters on different groups across society

Government

Direct

- Emergency response and recovery expenditures;
- Reconstruction expenditures for uninsured/underinsured public infrastructure, public buildings, and often low-income housing;
- Costs for improvements of reconstructed infrastructure, as well as for relocation of at-risk population;
- Expenditure on social and economic recovery support programs;
- Realization of contingent liabilities to state-owned enterprises, to firms that are critical to economic recovery, etc.

Indirect

- Decreased tax revenue due to economic disruption and declines in GDP growth;
- Opportunity cost of diverting funds from development and social programs to disaster response and reconstruction;
- Increased domestic/international borrowing costs;
- Potential negative impact on sovereign credit rating;
- Increased expenditures for social support programs (safety nets);
- Migration due to disaster impact (loss of livelihoods).

Homeowners and SMEs

Direct

- Reconstruction costs due to damage of often uninsured or underinsured assets;
- Health and other financial costs associated with human fatalities, injuries, and disabilities.

Indirect

- Loss of income/livelihood due to business interruption/unemployment or loss of wage earner;
- Loss of income/livelihood due to economic decline;
- Increased borrowing costs;
- Additional expenses such as health care and paying for alternative accommodation during reconstruction.

Direct and indirect financial impact of natural disasters on different groups across society

Farmers

Direct

- Reconstruction costs for often uninsured or underinsured assets;
- Restocking/replanting/rehabilitation of productive assets such as livestock or crops.

Indirect

- Loss of income for farmers and other supply chain actors due to interruption of crop/livestock/fish stock production;
- Loss of income for farmers and other supply chain actors due to economic decline and/or lack of access to markets;
- Increased borrowing costs;
- Increased risk aversion to new and innovative investments, leading to adoption of low-yield but safer seed varieties.

The Poorest

Direct

- Reconstruction costs for damaged assets;
- Replacement of livestock.

Indirect

- Decreases in expenditure on food, accommodation, and human capital (possibly combined with higher costs for healthcare, education, etc);
- Loss of social support due to breakdown in informal safety net systems such as family and community support;
- Loss of income and unemployment;
- Increased borrowing costs.

The Policymakers' Burden of Natural Disasters



Policy makers are primarily concerned with its effect on the government, homeowners and small and medium-sized enterprises (SMEs), farmers, and the most vulnerable



The government's central role in natural disaster emergency relief, recovery, and reconstruction usually results in a large and direct financial burden



Can have significant impacts on the budget and other spending as well as on debt



The macroeconomic costs of natural disasters, including the immediate decline in GDP growth and the cumulative, permanent GDP loss during the years following a major disaster, affect the government's budget.

The Policymakers' Burden of Natural Disasters



Natural disasters can also escalate borrowing costs, especially for already highly indebted nations.



Financial impacts on the population often increase demand on pre-existing social programmes, with a related increase in public spending on safety nets and other social programs such as unemployment benefits for those who lost their job.



Together, the direct and indirect financial effects of disasters can seriously hurt public finances.



The government's fiscal balance weakens as expenditures rise and the tax base shrinks, potentially generating or worsening fiscal deficits.



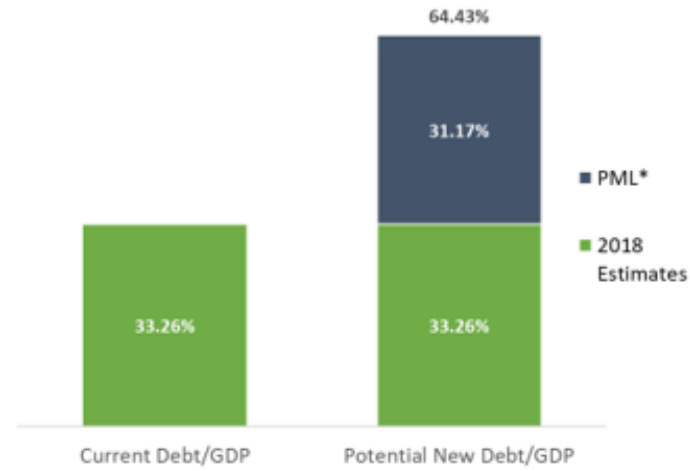
The country's balance of payments deteriorates as exports decrease and imports increase.



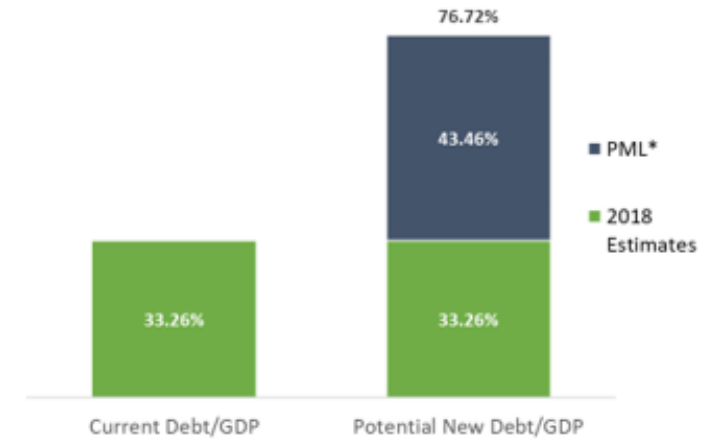
Long-term development prospects suffer as the government diverts public funding from social and economic development programmes to fill these gaps.

Fiscal Impact of Natural Disasters – Some Examples

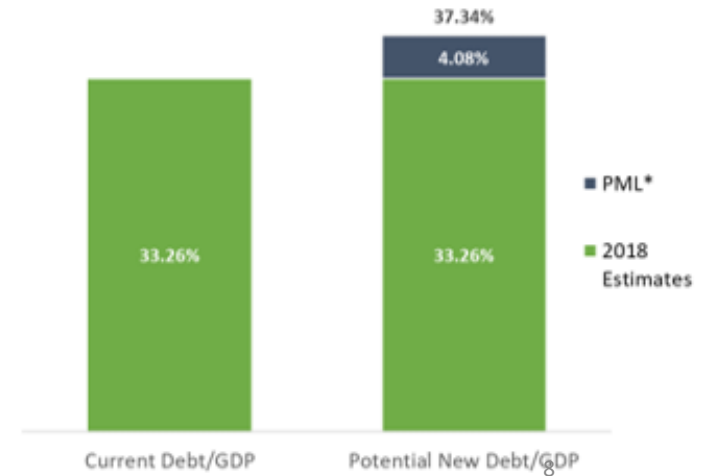
Country 1: EQ Impact (Debt/GDP)



Country 1: TC Impact (Debt/GDP)



Country 1: XSR Impact (Debt/GDP)



Disaster Risk Management Framework

PILLAR 1: RISK IDENTIFICATION

Improved identification and understanding of disaster risks through building capacity for assessments and analysis

PILLAR 2: RISK REDUCTION

Avoided creation of new risks and reduced risks in society through greater disaster risk consideration in policy and investment

PILLAR 3: PREPAREDNESS

Improved capacity to manage crises through developing forecasting and disaster management capacities

PILLAR 4: FINANCIAL PROTECTION

Increased financial resilience of governments, private sector and households through financial protection strategies

PILLAR 5: RESILIENT RECOVERY

Quicker, more resilient recovery through support for reconstruction planning

Linking Fiscal Policies with DRM

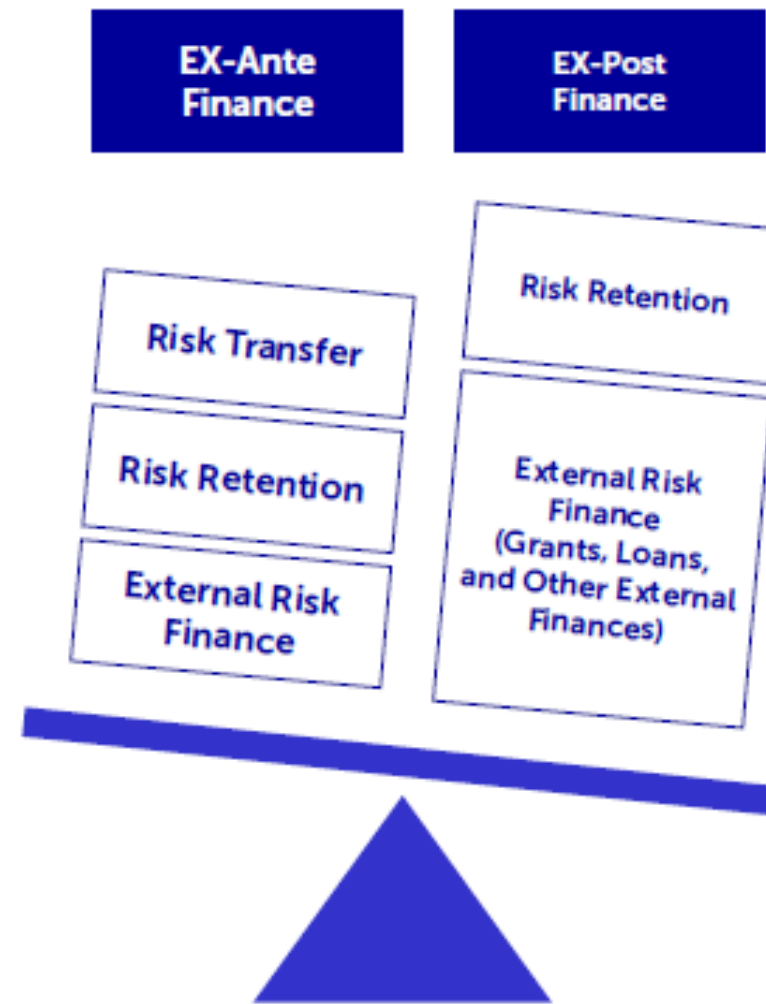
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- Natural disasters and financial crises are typically exogenous events that represent covariate shocks across a country and households.
- The impacts from natural hazards continue to outpace investments to strengthen homes, businesses, and other critical infrastructure.
- Economic damages from natural hazards can jeopardize the health of national economies at a level comparable to or greater than that of financial crises.
- Natural disasters also destroy human and physical capital stocks of countries – something that financial crises do not.

Meeting Disaster Risk Related Needs – Disaster Risk Financing



Ex-Ante and Ex- Post Finance

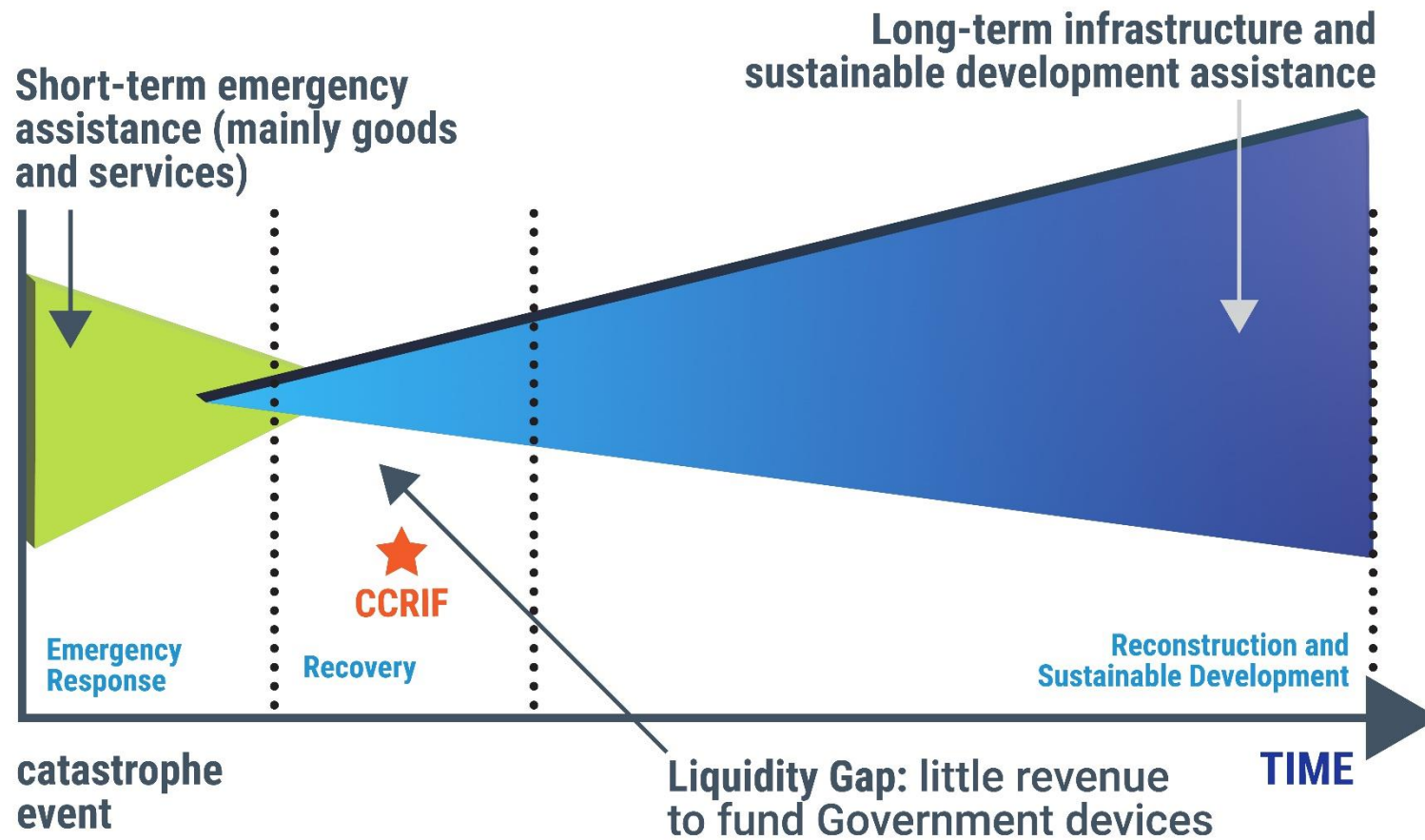
Ex-Ante

- Risk transfer such as insurance and regional risk pools such as CCRIF and ARC, Insurance for Public Assets, Natural Resource Insurance, Meso and Microinsurance, Catastrophe Bonds
- Risk Retention such as Government revenue and budget allocation, contingency and dedicated reserve funds, taxation (to increase resources for DRR)
- External risk finance such as contingent credit facilities which can be arranged ex-ante

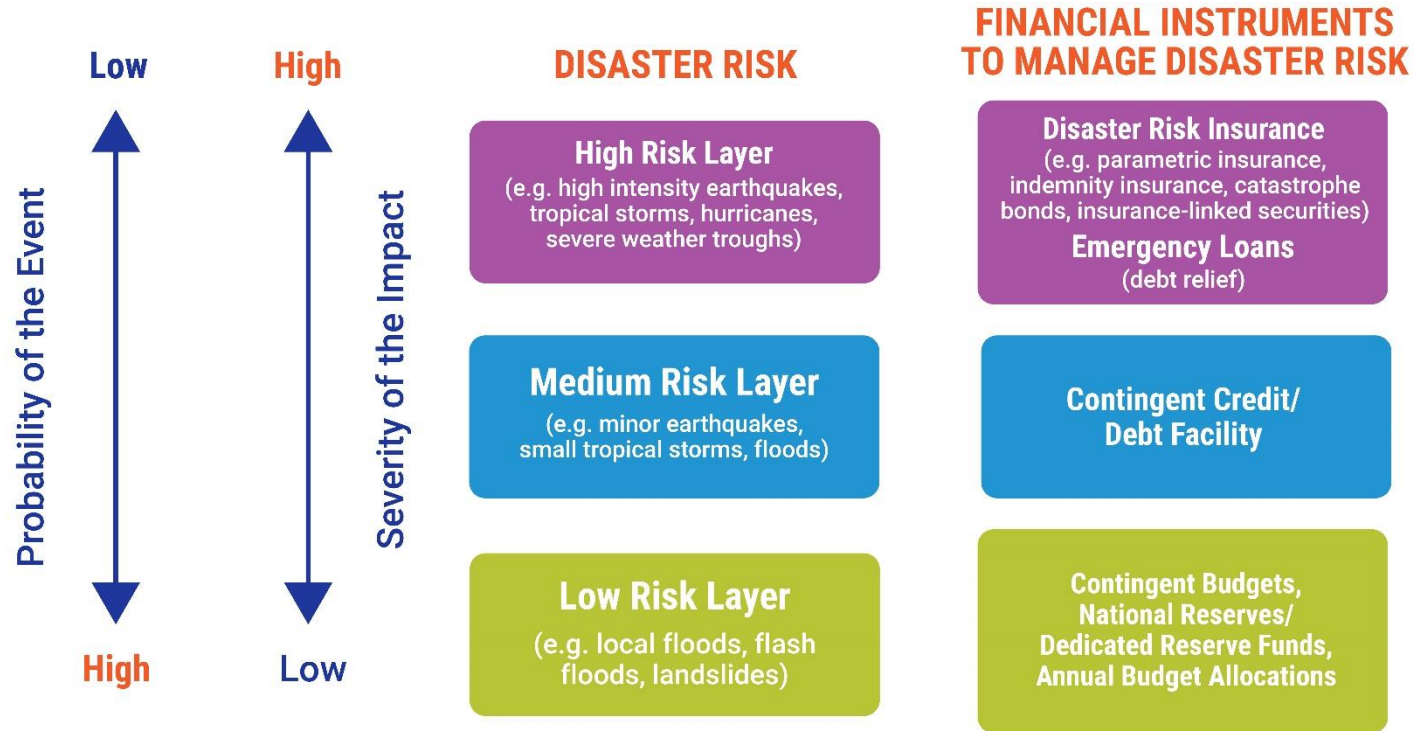
Ex-Post

- Risk Retention such as budget reallocation and realignment, taxation (to raise resources for recovery)
- External Risk Finance such as loans and grants

Sovereign Liquidity Gap



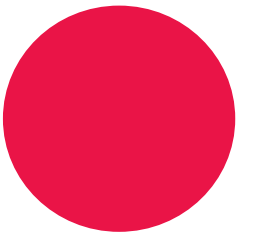
Which Instruments should a government choose?



Risk Layers and Corresponding Disaster Risk Management Instruments

CCRIF:

- Is the world's first and '*most successful*' multi-country, multi-peril risk pool based on parametric insurance
- Is a development insurance company – as the goods and services we provide are designed to enhance the overall development prospects of our members
- Offers products not readily available in traditional insurance markets
- Provides parametric insurance - a key component in a country's disaster risk financing strategy and is designed to pre-finance short-term liquidity, reduce budget volatility and allow countries to respond to their most pressing needs post disaster
- Provides quick liquidity allowing governments to quickly support the most vulnerable in their population immediately after a natural disaster





Earthquake



Tropical Cyclone



Excess Rainfall



Fisheries



Electric utilities



Water utilities

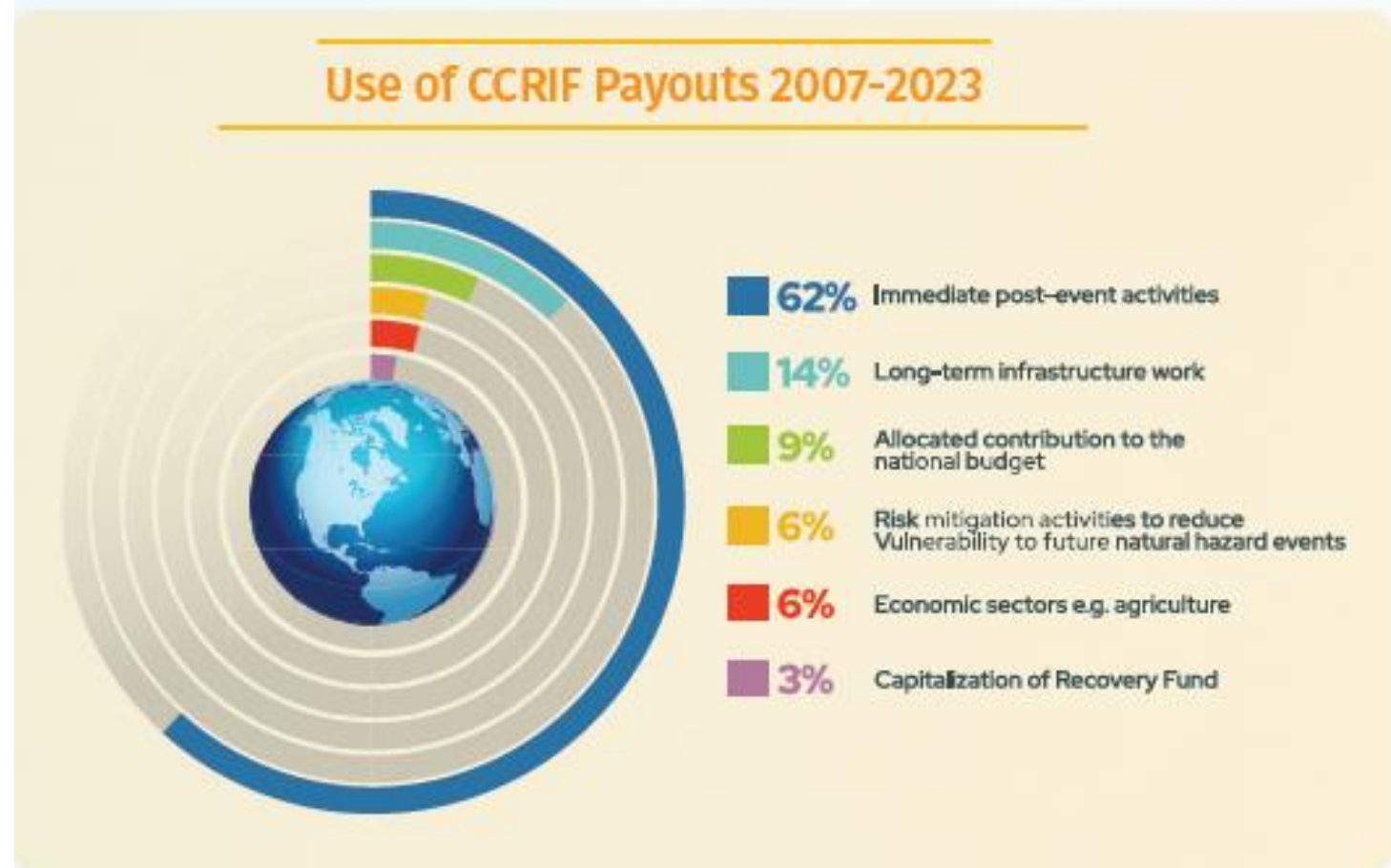
CCRIF Parametric Insurance Products

1. EQ - Based on losses due to ground shaking
2. TC - Based on losses due to wind and storm surge
3. XSR – Based on losses due to amount of rainfall
4. COAST – Based on losses in fisheries sector due to rain, waves, wind and storm surge
5. Electric Utilities – Based on losses for electric T & D lines due to wind
6. Water Utilities – Based on losses for water and wastewater utilities due to rain, wind and storm surge

Payouts and Use of Payouts

Since 2007, CCRIF SPC has made 64 payouts to 17 member governments totalling US\$268 million

- 4 payouts in 2023 totalling US\$6 million to Antigua and Barbuda, British Virgin Islands, St. Kitts and Nevis
- Single largest payout: Haiti – US\$40 million for August 14, 2021 earthquake
- Members receiving the largest number of payouts: Trinidad and Tobago and Barbados – 8 in total
- Member receiving the largest value in payouts: Haiti – US\$78 million



Uniqueness of CCRIF Parametric Insurance Policies



CCRIF represents a cost-effective way to pre-finance short-term liquidity to begin recovery efforts for an individual government after a catastrophic event, thereby filling the gap between immediate response aid and long-term redevelopment



Unlike indemnity insurance, CCRIF's parametric insurance policies make payments based on the intensity of an event (for example, hurricane wind speed, earthquake intensity, or volume of rainfall) and the amount of loss calculated in a pre-agreed model caused by these events.



Parametric insurance enables payouts to be made very quickly after a hazard event.



CCRIF can make payouts of up to US\$150 million per peril for each country.



Benefits of Parametric Insurance

- Broad cover provides wide range of protections
- Generally less expensive than an equivalent indemnity insurance product
- Payouts can be calculated and made very quickly because loss adjusters do not have to be relied on to estimate damage after a catastrophe event, which can take months
- Policyholder does not have to provide detailed asset values and other information prior to the insurance programme commencing
- Provides customers confidence when it comes to liquidity and speed of payout
- Is less exposed to moral hazard as the cost of insurance can be immediately related to the probability of an event and the payout is independent of any mitigation put in place after the policy is issued
- Fewer restrictions and exclusions
- Calculation of payouts is totally objective
- The risk, which drives policy pricing, is uniformly defined
- Complements traditional insurance coverage



How CCRIF Parametric Insurance Policies Work

CCRIF makes payouts within 14 days after an event.

Parametric insurance disburses funds based on the occurrence of a pre-defined level of hazard and impact

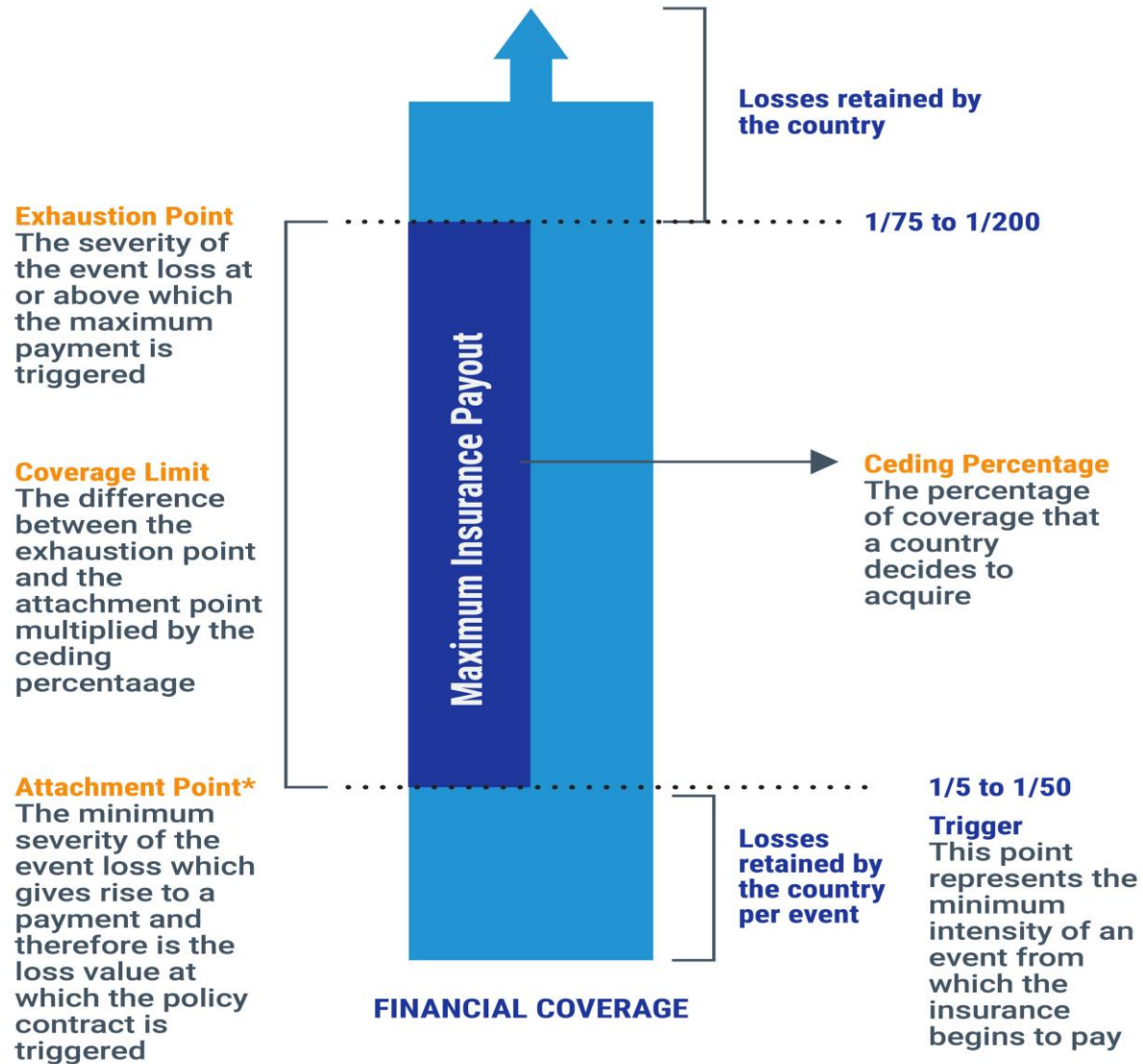
Policy triggered on the basis of exceeding a pre-established trigger event loss – attachment point

Estimated based on wind speed and storm surge (tropical cyclones) or ground shaking (earthquakes) or volume of rainfall (excess rainfall)

Hazard levels applied to pre-defined government exposure to produce a loss estimate

Payout amounts increase with the level of modelled loss, up to a pre-defined coverage limit

Elements of CCRIF Policies



CCRIF policy premiums depend on the selection by Governments of 3 elements:

- Attachment Point
- Ceding Percentage
- Exhaustion Point

These are informed by the country's risk profiles

A country's policy is triggered when the modelled loss for a hazard event in that country exceeds the attachment point specified in the policy contract.

CCRIF's risk models

Real time modeling for natural disasters

- ✓ CCRIF's models are run in **real time**, using **open data** produced by **internationally recognized agencies**
- ✓ With real time modelling, CCRIF can **monitor** the evolution of any potentially damaging event while it unfolds using **up-to-date** meteorological and remotely sensed data
- ✓ Real time modelling enables CCRIF to quickly and accurately assess the impact of an event and trigger **automated payouts**, reducing the time it takes to provide assistance to country members



CCRIF's risk models

SPHERA Tropical Cyclone underpins TC policy Product

- ✓ Modern, **state-of-the-art** model designed to **support parametric insurance** against damage caused by **wind and storm surge** induced by tropical cyclones
- ✓ It uses a **probabilistic approach** to generate a catalogue of possible storms from the analysis of the historical tracks to provide a **robust** estimate of TC risk in any given area

Also
underpins
the electric
utilities and
COAST
policies (TC
component)

UPGRADED in 2023: drawing on past experience and meeting members' requests:

- ✓ **New stochastic catalogue:** the assessment of the risk is more accurate and reliable
- ✓ Additional trigger for **localised events** that hit with very high intensity a small part of a country

CCRIF's risk models

SPHERA Earthquake underpins the EQ policy product

- ✓ Modern, **state-of-the-art** model designed to **support parametric insurance** against damage caused by **earthquakes**
- ✓ It performs a probabilistic seismic hazard analysis to generate a stochastic event set that is used to produce a **fully probabilistic estimation** of the losses induced by them on the exposed assets of the different countries

UPGRADED in 2023: for Jamaica, Haiti, and the Cayman Islands. These three countries share some of the same fault systems that contribute to their level of earthquake hazard.

- ✓ New representation of **seismic hazard** around Jamaica and Cayman Islands from state-of-the-art assessments

CCRIF's risk models

XSR 3.0 underpins the XSR policy product

- ✓ Sophisticated model designed to **support parametric insurance** against infrequent and catastrophic **extreme rainfall** events
- ✓ The model adopts an *ensemble* approach that incorporates multiple estimates in order to **reduce uncertainty**
- ✓ The model uses a combination of meteorological and satellite-based estimates to **improve reliability**

UPGRADED in 2023: drawing on past experience and meeting members' requests:

- ✓ **New** and **improved rainfall** datasets and models
- ✓ Additional trigger for **localized events** that have a disproportionate impact in small areas relative to the rest of the country
- ✓ Additional trigger for anomalously **wet seasons**

Projections for 2024 Hurricane Season – **Very Active Season**

- The 2024 Atlantic hurricane season is predicted to be an above-average season with 19 depressions, 16 tropical storms, 11 hurricanes and 6 major hurricanes.
- The prediction for 2023 was to be 15% below average and for there to be 13 named storms, six hurricanes, and three major hurricanes.
- However, the 2023 Hurricane season was the fourth most active Atlantic hurricane season on record with 20 named storms forming, tied with 1933. Among them, 7 became hurricanes, with 3 reaching major hurricane strength. Warm sea temperatures accounted for this. However, storms were largely not threatening to land and the ones that were ended up being far less impactful than had been feared by insurance, reinsurance and insurance-linked securities (ILS) market interests.
- For 2024 Tropical Storm Risk (TSR) predicts that the Atlantic hurricane season activity will be around 30% above the 1991-2020 30-year norm and around 50% above the long-term 1950-2023 norm.
- Due to: warmer sea surface temperatures, which are expected to enhance hurricane activity; el Niño winters and springs tending to have weak trade winds across the Tropical Atlantic, favoring continued (or increased!) Atlantic warmth; and the rising odds of a return to La Niña conditions in the second half of 2024 (more intense hurricanes).
- Renewal considerations and insurance implications for CCRIF?





In Closing
CCRIF is
essentially
about...

- providing quick liquidity.
- allowing governments to quickly support the most vulnerable in their population immediately after a natural disaster.
- reducing budget volatility.
- not increasing the debt stock of countries – parametric insurance will not result in an increase in debt stock as it is not a form of disaster relief as are credit facilities.
- offering diverse products for both a range of perils and economic sectors and industries.
- offering products and services not readily available in traditional insurance markets.



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