CCRIF SPC: A Natural Catastrophe Risk Insurance Mechanism for Caribbean Countries

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CCRIF SPC (CCRIF)

A Natural Catastrophe Risk Insurance Mechanism for Caribbean Countries

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Outline

1. CCRIF SPC Overview and Background
2. How CCRIF SPC Works
3. CCRIF SPC Cat Models
4. Payouts Made to Date
5. Other Aspects of the Facility
CCRIF SPC OVERVIEW AND BACKGROUND
About CCRIF

The world’s first multi-country risk pool to cover sovereign risk via parametric insurance was launched in 2007.

Designed to limit the financial impact of catastrophic hurricanes and earthquakes.

Provides short-term funding to support relief in the immediate aftermath of a natural disaster.
Overview

CCRIF – the world's first multi-country risk pool providing parametric insurance and was designed to limit the financial impact of catastrophic hurricanes and earthquakes by quickly providing short-term liquidity when a policy is triggered.

CCRIF is an example of a risk transfer mechanism, and such mechanisms are becoming increasingly important and a key and indispensable component of economic policy and DRM strategies as countries seek to grow their economies, reduce poverty and become internationally competitive.

CCRIF is able to provide insurance that is affordable to its members. CCRIF aggregates disaster risks across the Caribbean, achieving the kind of risk diversification and spreading that its members are not able to attain on their own.

CCRIF was developed under the technical leadership of the World Bank (WB) and with a grant from the government of Japan. It was capitalised through contributions to a multi-donor Trust Fund by the governments of Canada, the UK, France and Bermuda, the EU, WB, the CDB, as well as participation fees paid by member governments.
Focuses on Sovereign liquidity gap

![Graph depicting the timeline of emergency response, recovery, reconstruction, and sustainable development after a catastrophe event. The graph shows the liquidity gap as little revenue to fund Government services.]

**Emergency Response**
- Short-term emergency assistance (mainly goods and services)

**Recovery**
- Long-term infrastructure and sustainable development assistance

**Reconstruction and Sustainable Development**

**Time**

**Liquidity Gap**: Little revenue to fund Government services
HOW CCRIF SPC WORKS
Organisational Structure

CCRIF is managed by independent Service Providers operating remotely.
What is CCRIF’s Business Model?
Expansion to Include New Members - Central America

- Since late-2012, CCRIF has been engaged alongside partners at the US Treasury, World Bank and Inter-American Development Bank in a dialogue with the seven Central American members of COSEFIN, the group of Finance Ministers, regarding an expansion of CCRIF into that region.

- Nicaragua and Honduras were the first countries from Central America to announce they will be joining the facility.

- Panama, Costa Rica, Guatemala and El Salvador also have expressed strong interest in becoming members of the CCRIF.
What is Parametric Insurance?

An insurance contract where the ultimate payment or contract settlement is determined by a weather/geological observation or index, such as average temperature or rainfall over a given period or the intensity of an earthquake or wind storm.

Parametric instruments use a model to calculate the payout of the insurance policy. This payout model aims to closely mirror the actual damage on the ground and enables a much more rapid payment as no loss adjusters are required after the event to assess the actual damage.

Parametric insurance payouts are not based on individual loss adjustments, but are determined according to the measurement of a highly correlated index. Therefore, there is the potential for a mismatch between parametric insurance claims settlement and the actual losses of the insured.

- The possibility that a payout may be higher/lower than actual losses is “basis risk.”
Advantages of Parametric Policies

Parametric policies tend to carry lower premiums because administrative costs are reduced by eliminating the need for loss adjusters. Affordability is a major determinant in whether the target group purchases insurance.

Weather index products are less susceptible to the subjectivity that sometimes accompanies the indemnity-style loss adjustment procedures. With parametric products, the payout process is more objective since pre-determined index thresholds are the basis of all payouts.

Eliminating the need for loss adjusters allows for an expedited claims process and means that payouts, when due, can be made quickly.
# How CCRIF’s Parametric Insurance Products Work

<table>
<thead>
<tr>
<th>Parametric insurance disburses funds based on the occurrence of a pre-defined level of hazard and impact.</th>
<th>Policy triggered on the basis of exceeding a pre-established trigger event loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated based on wind speed and storm surge (tropical cyclones), ground shaking (earthquakes) or aggregate rainfall (excess rainfall)</td>
<td>Hazard levels applied to pre-defined government exposure to produce a loss estimate</td>
</tr>
<tr>
<td>Payout amounts increase with the level of modelled loss, up to a pre-defined coverage limit</td>
<td>CCRIF makes payouts within 14 days after an event</td>
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</tbody>
</table>
CCRIF SPC CAT MODELS
CCRIF Catastrophe Risk Model – Multi-Peril Risk Evaluation System (MPRES)

- Developed by Kinetic Analysis Corporation and implemented in 2010
- Estimates losses caused by wind and storm surge from tropical cyclones and ground-shaking caused by earthquakes
- Available as a regional public-good resource for research and practical application
- Produces accurate loss estimates with known statistical uncertainty.
- Uses publicly sourced input data
Risk Modelling Methodology

The hazard and loss modelling process includes the following stages.

1. **Event Characteristics**
2. **Land cover and elevation**
3. **Possible Inputs**
   - Population distribution
   - Local data
   - Economic Info

**Hazard Model**

**Vulnerability / Damage Model**

**Loss estimate**

**Exposures**

**Hazard estimate**

**Input data**

**Model**

**Product**

**Key**

**Insurance model**

**Portfolio losses**

**Risk maps**

**Contract info (deductibles, policy limit)**

**Hazard maps**
CCRIF/Swiss Re Excess Rainfall (XSR) Product

- CCRIF and Swiss Re started to collaborate in late-2011 to design and structure a "Parametric Excess Rainfall Cover" that could be used as an effective risk transfer solution

- Allows governments to hedge some of their risk resulting from extreme rain events, both during tropical cyclones and from other storms

- A rainfall loss model based on NASA rainfall data and CCRIF exposure data and calibrated against any known rainfall/flood impacts in all CARICOM countries

- 8 of our 16 member countries purchased the XSR product for the first time this year.
XSR - Technical Commentary

- XSR product is underpinned by parametric estimation of the impacts of heavy rain using the following inputs:
  - Rainfall from satellite data using NASA/JAXA TRMM daily rain data
  - Exposure from the CCRIF MPRES database which also underpins CCRIF’s other products
  - Vulnerability using empirical fitting of historical impact information

- Exposure mapping – 1km exposure data is mapped onto the 25km TRMM grid to provide a distribution of the total MPRES exposure value between rainfall measurement points

- Vulnerability is estimated from historical loss data; however, payout to premium relationship for each country is dictated by the raw TRMM rainfall data, so pricing is fair even if vulnerability estimation is uncertain

- Index loss calculation - for each event at each TRMM grid node, the single highest 2- or 3-day aggregate rainfall value within the event is used to calculate the loss rate via the vulnerability curve, which then translates to payout
## CCRIF Insurance Policies – Key Terms

<table>
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<tr>
<th>Attachment Point</th>
<th>Full Loss Limit</th>
<th>Ceding %</th>
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<tr>
<td>This is the loss value at which the policy contract is triggered and functions like a deductible in a standard insurance policy. Payouts are made on the policy when the modelled loss for an event in a member country equals or exceeds the attachment point specified in the contract. The country covers all losses below the attachment point.</td>
<td>The full loss limit is the difference between the attachment point and the exhaustion point, and represents the range of losses across which the CCRIF policy helps to share the risk.</td>
<td>The amount of the full loss limit that is being transferred to CCRIF. Once attachment and exhaustion points are selected, the amount of premium payable directly controls the ceding percentage.</td>
</tr>
<tr>
<td>Exhaustion Point</td>
<td>Coverage Limit</td>
<td></td>
</tr>
<tr>
<td>This refers to the severity of the event at or above which the maximum payment triggered. It is the loss value at which a full payout is due.</td>
<td>This is the full loss limit multiplied by the ceding percentage. The coverage limit is the maximum amount that can be paid out in any one year for any one peril. The payout may occur in a single event, or may comprise payouts for multiple events, once the event loss is above the attachment point.</td>
<td></td>
</tr>
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</table>
How are Payouts Calculated?

Tropical Cyclones (TC)
- Payouts are determined based on government losses calculated using storm data from the National Hurricane Center and parameters fixed within the loss estimation model used to underpin CCRIF’s policies.
- The model calculates the level of wind & ocean hazards, such as storm surge, encountered across the affected area and uses the pre-fixed value and distribution of government exposures to calculate a government loss.

Earthquakes (EQ)
- A payout would depend on the source magnitude and hypocentre (location and depth) of the EQ using data obtained from the United States Geological Survey. This is translated into a ground shaking intensity across each affected country which in turn drives generation of a modelled loss.
- The payout increases as the level of losses increases, and losses are directly calculated from the amount of ground shaking in the affected country and what assets are exposed to what level of shaking.

Excess Rainfall (XSR)
- Payouts are determined based on government losses calculated using enhanced rainfall data from the Tropical Rainfall Measurement Mission (TRMM) and fixed parameters within the loss estimation model.
- The model calculates the level of rainfall across the affected area and uses fixed loss rates at different rainfall levels and distribution of government exposures to calculate a government loss.

The specific payout totals are based on the level of coverage a country has.
PAYOUTS MADE TO DATE
11 Payouts since 2007 totalling US$34,875,583

- Earthquake, 29 November, 2007 – $528,021
- Earthquake, 29 November, 2007 – $418,976
- Tropical Cyclone Ike, September 2008 - $6,303,913
- Tropical Cyclone Earl, August 2010 - $4,282,733
- Tropical Cyclone Tomas, October 2010 - $3,241,613
- Tropical Cyclone Tomas, October 2010 - $1,090,388
- Tropical Cyclone Tomas, October 2010 - $8,560,247
- Tropical Cyclone Tomas, October 2010 - $493,465
- Trough, November 2014 - $559,249
- Trough, November 2014 - $559,249
- Earthquake, 12 January, 2010 - $7,753,579
- Earthquake, 29 November, 2007 – $528,021
- Earthquake, 29 November, 2007 – $418,976
- Tropical Cyclone Tomas, October 2007 – $8,560,247
- Tropical Cyclone Tomas, October 2007 – $418,976
Haiti Earthquake – January 2010

- Payout of $8 million made within 14 days
- CCRIF funds - first inflow of direct financial assistance received by that country
- Haitian government used the CCRIF funds to cover the salaries of key emergency personnel, thereby “keeping the wheels of government turning”
Tropical Cyclone Tomas 2010

- TC Tomas passed close to Barbados, Saint Lucia, and St Vincent & the Grenadines on 30 and 31 October
- CCRIF facilitated a request from the gov'ts for a release of 50% of their payments, 7 days after the storm's passage
- Total payout for this event was US$12.8 M
- The individual payouts for the three countries were as follows: Barbados - US$8,560,247; Saint Lucia - US$3,241,613 and St Vincent & the Grenadines - US$1,090,388.
Wind Footprint of TC Tomas from MPRES
XSR Payouts to Date

- Hurricane Gonzalo: 13 October 2014, Anguilla
  - Cat 1 hurricane passed directly over Anguilla leaving behind flood-damaged buildings and communities in its wake
  - First country to receive a payout for rainfall policy, 2nd payout for this country (received US$4.2 M in 2010 after Hurricane Earl)
  - Received – US$493,465

- Low pressure trough: 7-8 November 2014, Anguilla and St. Kitts & Nevis
  - Anguilla - US$559,249
  - St. Kitts and Nevis - US$1,055,408
Rainfall aggregation maps for TC Gonzalo and October 2014 trough

Event Date: 13th-14th October, 2014 (Gonzalo)

Event: 7th-8th November, 2014
OTHER ASPECTS OF THE FACILITY
## Technical Assistance (TA) Programme

<table>
<thead>
<tr>
<th>Scholarship/Prof Dev Programme</th>
<th>Regional Knowledge Building</th>
<th>Support for Local Initiatives</th>
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<tbody>
<tr>
<td>• Students across the region to benefit</td>
<td>• Partnerships with regional institutions</td>
<td>• Support for NGOs and other charitable organisations in local hazard risk reduction and climate change initiatives</td>
</tr>
<tr>
<td>• Scholarships for BSc and MSc programmes</td>
<td>• Funding for regional technical projects in natural hazards/risk science</td>
<td></td>
</tr>
<tr>
<td>• Continued professional development</td>
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Under the Technical Assistance Programme, CCRIF has among other things:

- Awarded over 24 scholarships (since 2010) to C’bean nationals either through its CCRIF Scholarship Programme or as part of its cooperation with member countries and regional organisations. Total disbursements to date are in excess of US$380,000.

- Established strategic alliances with key regional organisations and donors which are aimed at developing initiatives to reduce existing vulnerabilities in the small island and coastal states of the region. Seven MoUs have been signed to date with: CDEMA, CIMH, UN-ECLAC, CCCCC, OECS, UWI, UWI-SRC and IADB.

- CCRIF Real-Time Forecasting System (RTFS)
  - Provides countries with forecasts on max hazard levels and potential impacts including power outages and disruption to port operations. Facilitates contingency planning in order to reduce losses.

- Economics of Climate Adaptation (ECA) Study
Meso and Micro Level Covers

Climate Risk Adaptation and Insurance in the Caribbean Project

- Implemented by Munich Climate Insurance Initiative (MCII), CCRIF, MicroEnsure and MunichRe
- Funded by German Federal Ministry for the Environment (BMU), Nature Conservation and Nuclear Safety
- Provides insurance coverage for Caribbean people who are severely impacted by extreme weather events
- Two products: Livelihood Protection Policy (LPP) and Loan Portfolio Cover (LPC)
Livelihood Protection Policy (LPP)

The LPP helps protect the livelihoods of vulnerable low-income individuals such as small farmers and day labourers, by providing swift cash payouts following extreme weather events - high winds and heavy rainfall.

- Provided through local insurance companies and financial institutions
- Available in Saint Lucia, Jamaica, Grenada
- Policies sold to date – 76 Saint Lucia; 82 Jamaica
- In January 2014, LPP payouts made to policyholders in Saint Lucia following an extreme rainfall event in the Eastern Caribbean in December 2013
# LPP – Quick Facts

<table>
<thead>
<tr>
<th><strong>Insured:</strong></th>
<th>Low income individuals from various occupations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perils Covered:</strong></td>
<td>Wind and excess rain</td>
</tr>
<tr>
<td><strong>Trigger:</strong></td>
<td>Peak wind speed; rainfall aggregate over specified time period</td>
</tr>
<tr>
<td><strong>Limit:</strong></td>
<td>$x annually</td>
</tr>
<tr>
<td><strong>Annual Premium:</strong></td>
<td>8% of annual limit</td>
</tr>
<tr>
<td><strong>Link to DRR:</strong></td>
<td>SMS Warning including info regarding risk reduction methods</td>
</tr>
<tr>
<td><strong>Insurer:</strong></td>
<td>Local insurance company</td>
</tr>
<tr>
<td><strong>Agent/distributor:</strong></td>
<td>Various – financial service providers with large rural/low-income footprint (Credit unions, cooperatives, MFIs, etc.)</td>
</tr>
<tr>
<td><strong>Trigger notification:</strong></td>
<td>Via text message (SMS)</td>
</tr>
<tr>
<td><strong>Geographical area:</strong></td>
<td>Jamaica, St. Lucia, Grenada</td>
</tr>
<tr>
<td><strong>Inception date:</strong></td>
<td>Registration date (10 days after purchase); closed period during forecasted weather systems</td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
<td>1 year from inception date</td>
</tr>
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Loan Portfolio Cover

The LPC insures loan portfolios against climate risk

- Targeted at financial institutions
- Loan portfolio hedge for lending institutions
- To be available in Saint Lucia, Jamaica and Grenada
Contact us at pr@ccrif.org
www.ccrif.org

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