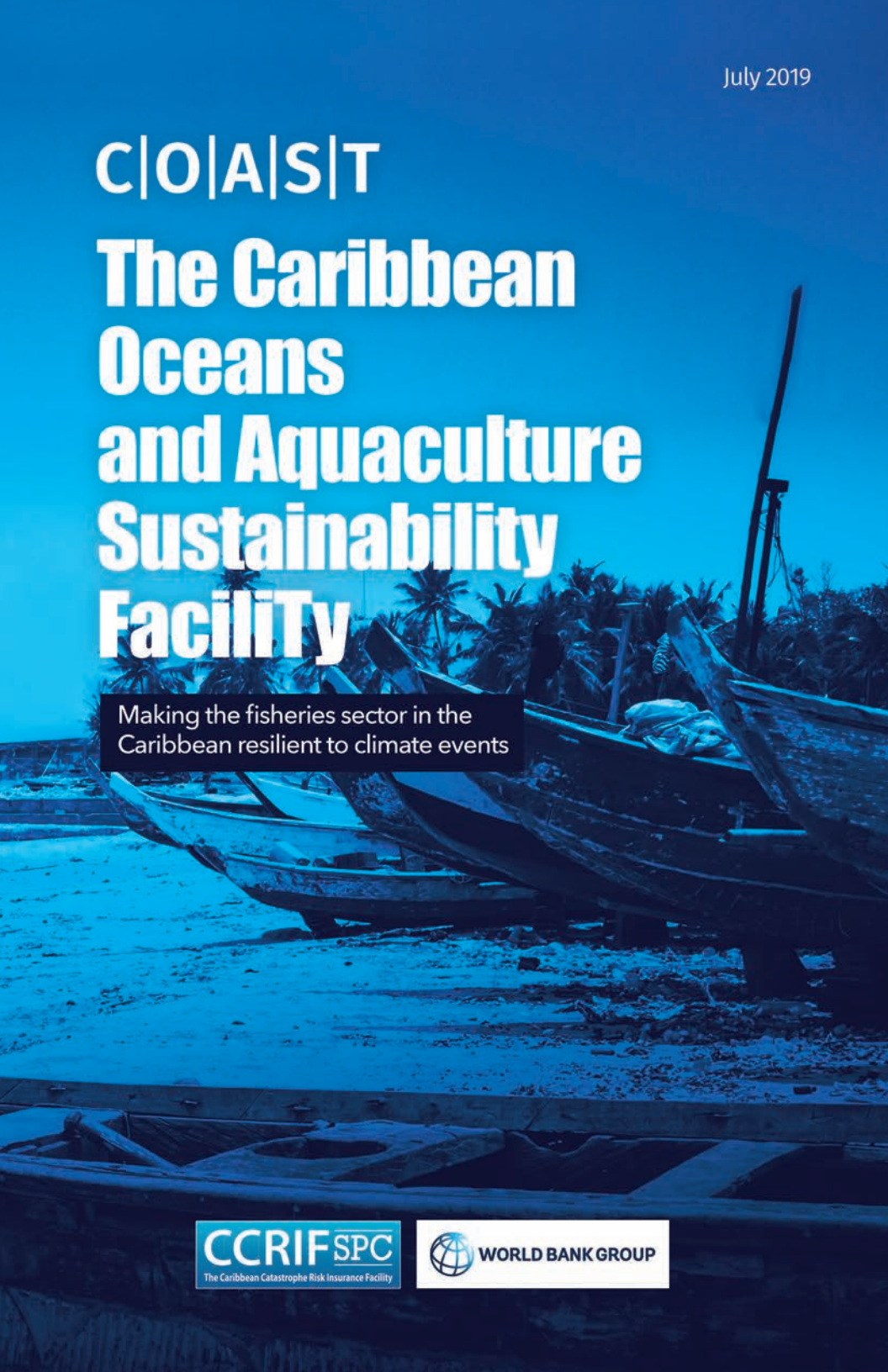
July 2019

C|O|A|S|T

The Caribbean Oceans and Aquaculture Sustainability FaciliTy

Making the fisheries sector in the Caribbean resilient to climate events



CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility

WORLD BANK GROUP

A Note on the Fisheries Sector in the Caribbean

The fisheries sector in the CARICOM Region is an important source of livelihoods and contributes significantly to food security, poverty alleviation, employment, foreign exchange earnings, development and stability of rural and coastal communities, culture, recreation and tourism. The sector also is an important contributor to Gross Domestic Product (GDP) of many countries as well as an important foreign exchange earner and accounts for up to 7 per cent of some countries' GDP. Additionally, its potential in terms of value-added processing and linkages with other sectors such as tourism, remains substantial.

The sector employs over 300,000 persons both directly and indirectly. Indirect employs to the sector include persons engaged in processing, preserving, storing, transporting, marketing and distribution or selling fish or fish products, as well as other ancillary activities, such as net and gear making, ice production and supply, vessel construction and maintenance as well as persons involved in research, development and administration linked with the fisheries sector. Many of the fisherfolk in the region reside in rural communities where activities such as fishing and farming are the mainstay of these rural economies.

The fisheries sector also plays an important role in food security and disaster recovery. While the fisheries sector is highly vulnerable to climate hazards, after an event such as a storm, as soon as fisherfolk have the right weather conditions and functioning boats, they go out fishing and bring back fish to communities that would otherwise be isolated after a disaster. Therefore, the rapid recovery of the fisheries sector after a disaster is critical for the food security of communities in the Caribbean.

Climate Change in the Fisheries Sector in the Caribbean

Caribbean countries face many serious challenges in the interaction between the human population and the natural environment that sustains it, an underlying stress that is being exacerbated by climate change, the projected manifestations of which include rising sea levels and an increased frequency and severity of extreme weather events, especially hurricanes, tropical storms and droughts. These countries' vulnerability to natural hazards often result in widespread destruction of the productive economy and also the capital stock of their nations. The Region's tourism, agriculture, forestry and fisheries sectors; water resources; and human rights are considered to be most vulnerable to a changing climate. Climate change is considered to be the most pervasive and truly global of all issues affecting humanity, and poses a serious threat to the environment as well as to economies and societies.

Pterois volitans commonly called Lionfish – The Lion Fish is an example of an invasive species found in many Caribbean islands which has potentially devastating effects on the already vulnerable fisheries industry

The pressures faced by the fisheries sector in the Caribbean include:

- Poor fishing practices and poaching
- Degradation of supporting habitats (such as coral reefs, seagrasses, and mangroves)
- Sargassum blooms, which may result from increasing sea temperatures, agricultural fertilizers and untreated sewage flowing into the Caribbean Sea as well as changes in ocean currents.
- Invasive species (e.g. lion fish)
- Climate change impacts, particularly...
  - Extreme weather events and sea level rise
  - Ocean acidification, increases in sea temperature, and coral bleaching

The phenomena caused by climate change are projected to trigger a series of biophysical and socio-economic impacts which are likely to impact fisheries. Essential fish habitats such as mangroves, seagrass beds and coral reefs could shrink or disappear.

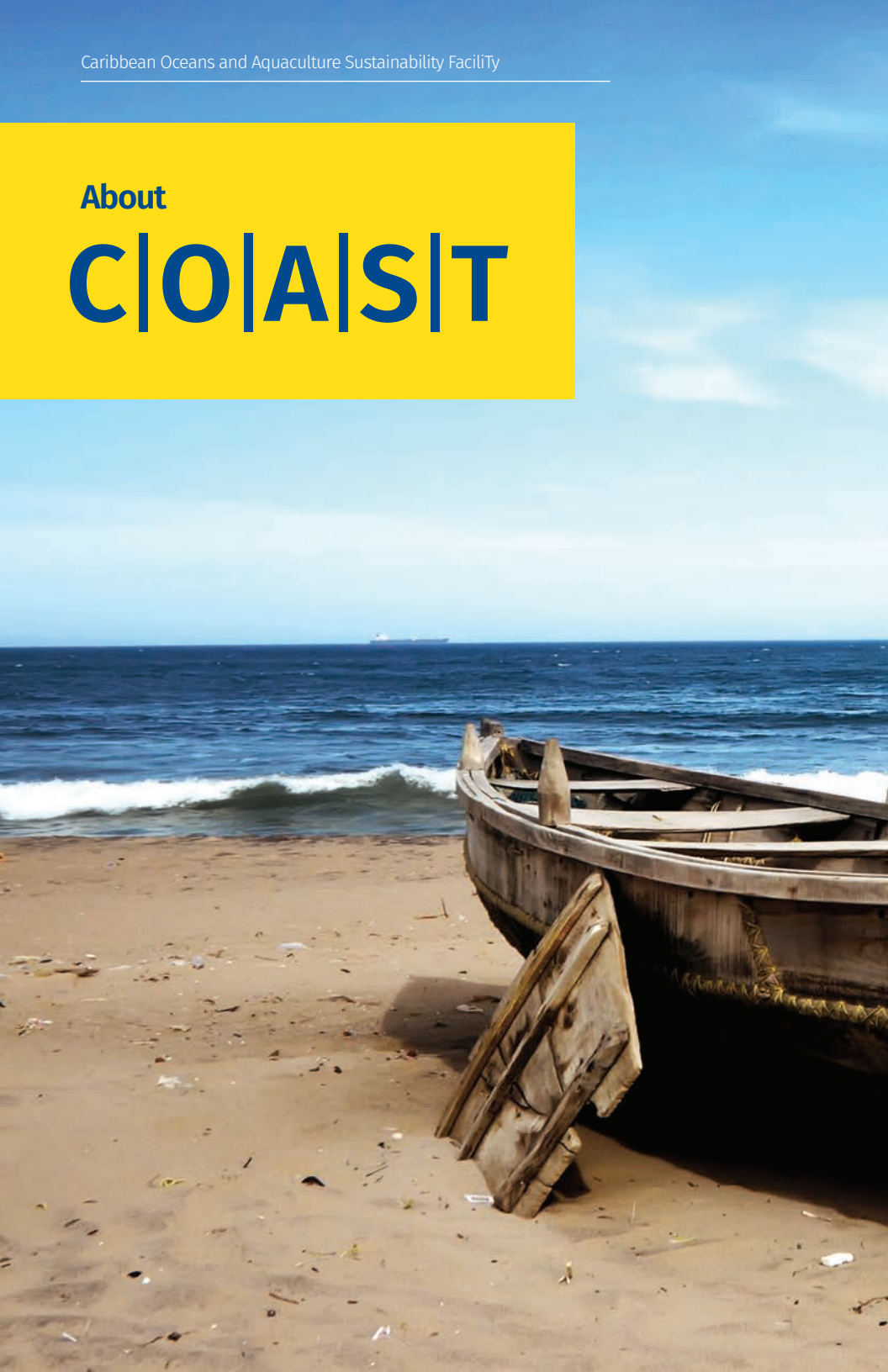
Studies have shown also that climate change is modifying the distribution and productivity of fish stocks, impacting the sustainability of fisheries and aquaculture and the livelihoods of the communities that depend on these activities.

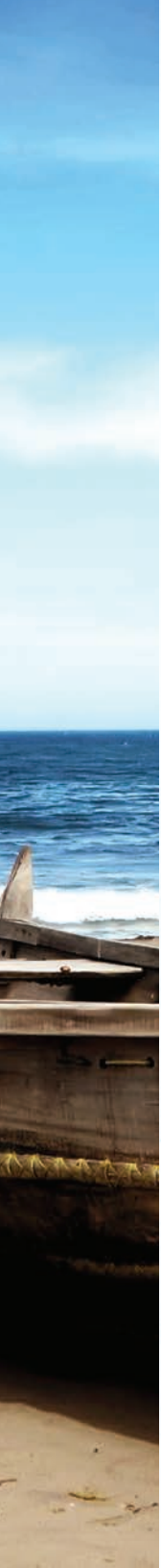
Projected increases in the variability in rainfall will result in more extreme droughts during the dry season and more intense rainfall in the wet season. Increased frequency and/or severity of storm surges – exacerbated by sea-level rise – are also expected. These factors will contribute to flooding, landslides and erosion in coastal areas that lie in the direct path of severe weather including tropical storms and hurricanes. In the absence of significant adaptation efforts including protecting key fish habitats and rebuilding fish stocks, severe weather events will exacerbate the challenges already faced by the fisheries sector, in addition to the health and status of coral reefs, water resources, land, agriculture and forests.

Recent hurricanes in the Caribbean and their devastating effects demonstrate the need for a climate risk insurance product to help governments and fishing communities take steps to reduce the potential damage before a storm event and recover from the inevitable damage of such events, returning to fishing activities with minimal disturbance.

To address these issues, the Caribbean Ocean and Aquaculture Sustainability FaciliTy (COAST) initiative was developed. COAST is an innovative climate risk insurance mechanism to promote: food security; livelihoods of fisherfolk; resilient fisheries; sustainable management of coastal infrastructure; and disaster risk reduction in the Caribbean.

About C|O|A|S|T





COAST has been developed with the financial support of the US State Department and has been led by the World Bank and CCRIF SPC (formerly the Caribbean Catastrophe Risk Insurance Facility). In addition, the Caribbean Regional Fisheries Mechanism (CRFM) has played an essential role, as it is required that countries benefiting from COAST must be implementing the Caribbean Community Common Fisheries Policy (CCCFP). COAST, which is designed to drive sustainable finance for Caribbean fisheries, was envisioned as a parametric insurance product at a scale relevant to vulnerable fishing communities.

Taking advantage of CCRIF's experience with parametric models and parametric insurance policies for tropical cyclone and excess rainfall, the COAST insurance product supports governments' efforts to rapidly put money into the hands of those impacted by extreme weather, providing them with immediate economic relief and promoting a culture of building back better to enhance coastal community resilience after an extreme weather event.

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PILOT COUNTRIES

2019/20

Grenada
Saint Lucia

For the 2019/20 policy year, CCRIF is making the COAST product for the fisheries sector available to two pilot countries, Grenada and Saint Lucia. The COAST parametric insurance product provides coverage for losses caused by adverse weather on fisherfolk and for direct damages caused by tropical cyclones to fishing vessels, fishing equipment and fishing infrastructure.

The COAST insurance product is another in a list of innovative parametric insurance products that are provided by CCRIF to Caribbean and Central American governments. Since its inception in 2007, CCRIF has been providing insurance for tropical cyclones and earthquakes, and in 2013, based on demand from its members, the Facility began providing coverage against excess rainfall events. The addition of the fisheries product reinforces CCRIF's commitment to meeting the needs of the region.

While it is governments that purchase COAST policies, this parametric insurance product is unique – it incorporates a livelihood protection component (akin to microinsurance) and a tropical cyclone component (sovereign insurance). The COAST product provides coverage for losses caused by "bad weather" on fisherfolk and for direct damages caused by tropical cyclones (wind and storm surge) to fishing vessels, fishing equipment and fishing infrastructure. In this case, "bad weather" is defined as high waves and occurrence of heavy rainfall throughout the policy year.

Once again, the Caribbean is leading the way in providing solutions for disaster risk financing. It is the first region globally to develop and implement parametric climate risk insurance for the fisheries sector. For the first time, vulnerable fishing communities will have access to insurance developed specifically for their needs, protecting their livelihoods and playing a key role in closing the protection gap.

Defining Parametric Insurance

Like all CCRIF insurance policies, the COAST policy is parametric.

Parametric insurance products are insurance contracts that make payments based on the intensity of an event (for example, hurricane wind speed or volume of rainfall) and the amount of loss calculated in a pre-agreed model caused by these events. Therefore, payouts can be made very quickly after a hazard event. This is different from traditional or indemnity insurance settlements that require an on-the-ground assessment of individual losses after an event before a payment can be made.

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
- 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

The main advantages of parametric insurance – as provided by CCRIF – are described in the table below along with the difference between parametric and indemnity insurance

	PARAMETRIC INSURANCE	INDEMNITY INSURANCE
LOWER PREMIUMS	Transaction and administrative costs are significantly lower	Costs of assessing claims is added to the premium
FASTER PAYOUTS	Provides payments based on a pre-defined level of hazard and impact	Need for thorough loss adjustment process after a hazard event based on on-the-ground assessment adds lag time – months or even years – to payment
OBJECTIVE & TRANSPARENT	Allows the policyholder direct access to information on which the payouts will be calculated. Calculation of payouts is totally objective, based on a few simple input parameters published widely in the public domain from the globally-mandated bodies responsible for estimating those particular parameters, and a set of formulae which form part of the policy.	Opinions on level of loss can vary by loss adjuster. Also, traditional indemnity insurance customarily has various conditions, exclusions and limitations that may introduce uncertainty and delay for an insured making a claim.
UNIFORMLY DEFINED RISK	All risk – which drives policy pricing – is defined using the same specified parameters; there is no subjectivity in the definition of the risk.	There is often some subjectivity in the definition of the risk.
REDUCTION IN MORAL HAZARD	The cost of insurance can be immediately related to the probability of an event, and the payout is independent of any mitigation efforts put in place after the policy is issued.	Policyholders may engage in riskier actions if they have purchased a policy against an event.
SIMPLE PROCESS TO OBTAIN COVERAGE	Governments do not have to provide detailed asset values and other information prior to the insurance programme commencing.	
SIMPLIFIED CLAIMS	Claims process is reversed. The insurer informs policyholder of payment.	Making a claim is a tedious process and can often take several months to complete.

Caribbean Oceans and Aquaculture Sustainability FaciliTy

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Policies and Payouts

The COAST insurance policy has two main components:

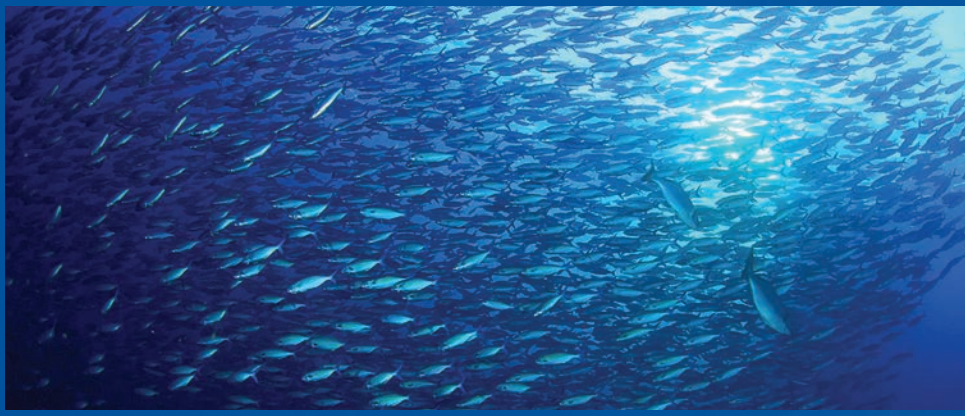
1. **Livelihood Protection (LP) Component:** includes the evaluation of losses caused by adverse weather to fisherfolk and fisheries cooperatives that prevent them from carrying out their usual activities, which is related to the sea condition and the occurrence of heavy rainfall. This is based on:
   - rough seas caused by meteorological phenomena either close to the areas of interest (wind storms) or at hundreds of km (swells)
   - strong rainfall events

   Adverse Weather Events are defined as days where either one of the rainfall and wave height estimates exceeds its respective threshold (differentiated by small and medium boats) and end when both estimates are below the threshold. The loss is estimated by multiplying the unit value of an individual fishing day by the number of fisherfolk in the corresponding port/landing site. Country losses are obtained by summing the assets' individual losses and then aggregating them on a yearly basis since the model aims to identify years with very bad weather and long interruptions of fishing activities. Therefore, events of fewer than 3 days are not considered in the total account of annual losses.

2. **Tropical Cyclone (TC) Component:** includes the assessment of direct damages by tropical cyclone events (winds and storm surge) to fishing vessels, fishing equipment and infrastructure, which is related to tropical cyclone-induced strong winds and storm surges. This is based on:
   - high winds - 1-minute sustained wind speed at a height of 10m
   - storm surge

   The assets that form the basis of the policy comprise infrastructure, vessels and fishing equipment as well as fisherfolk with attributes that describe their vulnerability to a catastrophe event. These are shown in the table below.

ASSET TYPE	DESCRIPTION	SOURCE OF INFORMATION
INFRASTRUCTURE	• Ports (large, medium, small) • Landing sites (with infrastructure and land infrastructure only) • Both include sheds, warehouses, docks, harbors, gas station, marketplaces and offices among others	• Aerial surveys and photogrammetry • Previous work conducted by CCRIF on the SPHERA model for Tropical Cyclones • Reports from local institutions
VESSELS AND FISHING EQUIPMENT	• Boats (small, medium)	• Government data and information • Local information • UN Food and Agriculture Organization (FAO) country reports • Caribbean Reginal Fisheries Mechanism (CRFM)
FISHERFOLK	• Fisherfolk (full and part time)	• World Bank COAST Report • FAO country reports • CRFM



Triggering a COAST Policy

A country's COAST policy can be triggered under the Livelihood Protection component and/or the Tropical Cyclone component:

- **Livelihood Protection Component:** If the total modelled losses caused by adverse weather at the end of the policy year are greater than the LP trigger (known as the LP attachment point)
- **Tropical Cyclone Component:** If the modelled losses caused by the wind and storm surge from a particular cyclone are greater than the TC trigger (known as the TC attachment point)

COAST Payouts

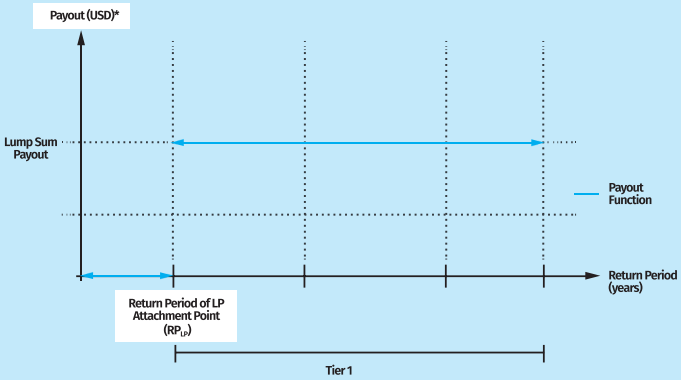
The COAST policy follows a three-tier payment scheme organized as follows:

- Tier 1 consists of a lump sum payment provided once the annual aggregate deductible threshold is met using the Livelihood Protection (LP) component.
- Tier 2 consists of a lump sum payment provided if a Tropical Cyclone event loss is within a range defined by the policy.
- Tier 3 provides a lump sum payment if a Tropical Cyclone event loss is above the Tier 2 interval´s upper limit.

Since Tier 1 is based on a different risk model component from Tiers 2 and 3, the payouts are estimated independently as shown in the figures on page 13.

For the LP component, if the modelled loss for the year is less than the LP attachment point, there is no payout. If the loss is more than the LP attachment point there is a lumpsum payout.

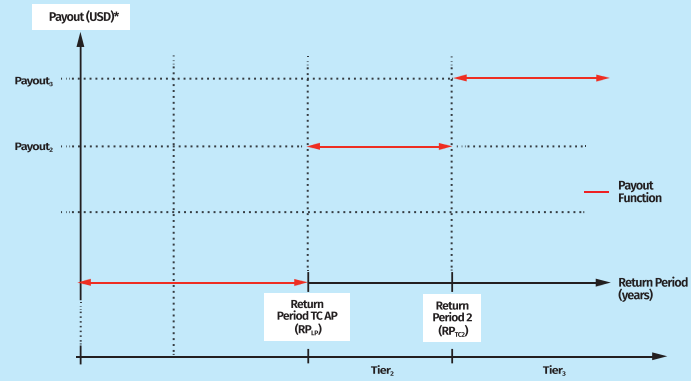
Figure i



Livelihood Protection Component Payout Scheme

For the TC component, if the modelled loss for a particular tropical cyclone is less than the TC attachment point, there is no payout. If the loss is in the defined range for Tier 2, the payout is equal to Payout2. If the modelled losses are above the Tier 2 limit, the payout is equal to Payout3.

Figure ii



Tropical Cyclone Component Payout Scheme

The return period is the expected time between hazard events of a certain magnitude. For example, an attachment point with a return period of 5 years represents the loss amount (in dollars) which is likely to be exceeded only once in 5 years.

Importance of COAST Insurance for the Fisheries Sector

The COAST insurance product for the fisheries sector is an innovative climate risk insurance mechanism and will be an essential tool to help address the impacts of natural hazards on food security and livelihoods of those working in the fisheries sector. In the long term, this product will promote resilience in the fisheries sector and contribute to the sustainable management of the ecosystems that support the sector by incentivizing policy reforms for the uptake of climate-smart fisheries practices and increasing coastal resilience. This will help to build a stronger foundation for advancing the blue economy, while supporting the livelihoods of those who depend on the valuable marine resource.

Some C|O|A|S|T Highlights

First ever climate risk parametric insurance developed for the fisheries sector spearheaded by the Caribbean. Caribbean is the first region globally to develop and implement a parametric climate risk insurance products for the fisheries sector. For the first time, vulnerable fishing communities will have access to insurance developed specifically for their needs.

First time insurance coverage of "bad weather" events, in addition to covering tropical cyclones. COAST innovates in covering losses attributed to fisherfolk due to "bad weather" events, defined as high waves and occurrence of heavy rainfall throughout the policy year. The "bad weather" model will be considered for the first tier, while the tropical cyclone model for the second and third tiers of the insurance.

First time tracking of parametric insurance payouts at the scale of individual beneficiaries. Through the predefined procedures for payout transfers, COAST allows for tracking the flow of funds down to the level of the beneficiaries, with a financial management and auditing system in place.

COAST – a catalyst for promoting resilience in the fisheries sector, leading to a stronger blue economy in the region. COAST will reduce the risk that climate change poses to food security in the fisheries sector, and incentivize policy reforms for the uptake of climate smart fisheries practices as well as coastal resilience. This will build a stronger foundation for the blue economy, while supporting the livelihoods of those who depend on this valuable marine natural capital.

COAST encourages inclusiveness and participation of women. COAST is intended to be inclusive and benefits all participants in the fisheries sector, including crew members, captains and/or boat owners, and especially fish vendors and processors who are mostly women. The list of beneficiaries was predefined by the governments as per COAST Operational Manual.

Rapid transfer of payouts to fisherfolk. CCRIF SPC payouts will be channeled through the Ministry of Finance of the participating countries within 14 days of the covered event, followed by a rapid transfer to the fisherfolk.

New partnerships developed to support COAST. CCRIF SPC and the Caribbean Regional Fisheries Mechanism (CRFM) have signed a MOU to support COAST and develop climate-resilient fisheries and aquaculture industries in the region.

CCRIF SPC

The Caribbean Catastrophe Risk Insurance Facility

CCRIF SPC is a segregated portfolio company, owned, operated and registered in the Caribbean. It limits the financial impact of catastrophic hurricanes, earthquakes and excess rainfall events to Caribbean and – since 2015 – Central American governments by quickly providing short-term liquidity when a parametric insurance policy is triggered. It is the world's first regional fund utilizing parametric insurance, giving member governments the unique opportunity to purchase earthquake, hurricane and excess rainfall catastrophe coverage with lowest-possible pricing.

In 2007, the Caribbean Catastrophe Risk Insurance Facility was formed as the first multi-country risk pool in the world, and was the first insurance instrument to successfully develop parametric policies backed by both traditional and capital markets. It was designed as a regional catastrophe fund for Caribbean governments to limit the financial impact of devastating hurricanes and earthquakes by quickly providing financial liquidity when a policy is triggered.

In 2014, the facility was restructured into a segregated portfolio company (SPC) to facilitate expansion into new products and geographic areas and is now named CCRIF SPC. The new structure, in which products are offered through a number of segregated portfolios, allows for total segregation of risk. In April 2015, CCRIF signed an MOU with COSEFIN - the Council of Ministers of Finance of Central America, Panama and the Dominican Republic - to enable Central American countries to formally join the facility.

CCRIF SPC is registered in the Cayman Islands and operates as a virtual organization, supported by a network of service providers covering the areas of risk management, risk modelling, captive management, reinsurance, reinsurance brokerage, asset management, technical assistance, corporate communications and information technology.

CCRIF offers earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments and is developing models and products for drought, fisheries/aquaculture, agriculture and public utilities

CCRIF helps to mitigate the short-term cash flow problems small developing economies suffer after major natural disasters. CCRIF's parametric insurance mechanism allows it to provide rapid payouts to help members finance their initial disaster response and maintain basic government functions after a catastrophic event.

Since the inception of CCRIF in 2007, the facility has made 38 payouts to 13 member governments on their tropical cyclone, earthquake and excess rainfall policies totalling US$139 million.

CCRIF was developed under the technical leadership of the World Bank and with a grant from the Government of Japan. It was capitalized through contributions to a Multi-Donor Trust Fund (MDTF) by the Government of Canada, the European Union, the World Bank, the governments of the UK and France, the Caribbean Development Bank and the governments of Ireland and Bermuda, as well as through membership fees paid by participating governments.

In 2014, an MDTF was established by the World Bank to support the development of CCRIF SPC's new products for current and potential members, and facilitate the entry for Central American countries and additional Caribbean countries. The MDTF currently channels funds from various donors, including: Canada, through Global Affairs Canada; the United States, through the Department of the Treasury; the European Union, through the European Commission, Germany, through the Federal Ministry for Economic Cooperation and Development and KfW, and Ireland. In 2017, the Caribbean Development Bank, with resources provided by Mexico, approved a grant to CCRIF SPC to provide enhanced insurance coverage to the Bank's Borrowing Member Countries.

CCRIF currently has 21 members.

OUR CARIBBEAN MEMBERS

Caribbean – Anguilla, Antigua & Barbuda, The Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, Montserrat, St. Kitts & Nevis, Saint Lucia, Sint Maarten, St. Vincent & the Grenadines, Trinidad & Tobago and Turks & Caicos Islands

Central America – Nicaragua, Panama

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