



COAST

Technical Workshop and Consultation





COAST Technical Workshop and Consultation

Session 1:

Understanding COAST



CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility

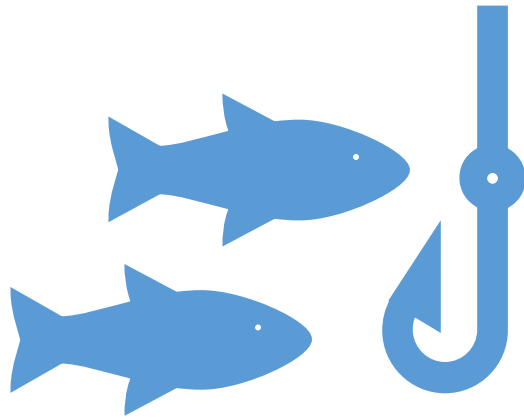


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Main Objectives



- To enhance the understanding of COAST among key technocrats
- To illustrate how COAST can contribute to reducing vulnerabilities in the fisheries sector and can be a key component of a country's SRSP
- To understand how parametric insurance works and how it is being applied within the fisheries sector
- To share the main requirements of COAST, including requirements of the model and the role of stakeholders in the ministries of finance, agriculture and fisheries
- To showcase the other key elements of COAST, e.g., payment requirements, involvement of cooperatives, the M&E framework, and the importance of developing sustainable fisheries management plans for fishing communities

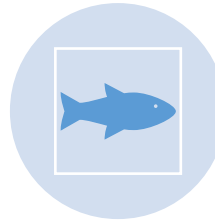
Video Presentation

The work and impact of CCRIF in the Caribbean and Central America

<https://www.youtube.com/watch?v=boY4isB5RkY&t=137s>



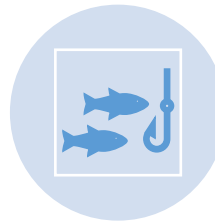
A parametric insurance product providing quick payouts



Supports the livelihoods of fishers and others in the fisheries industry



Designed to support governments' efforts to rapidly put money into the hands of those impacted by extreme weather, providing them with immediate economic relief.



Policy includes mechanism for disseminating payout to beneficiaries in the fisheries sector

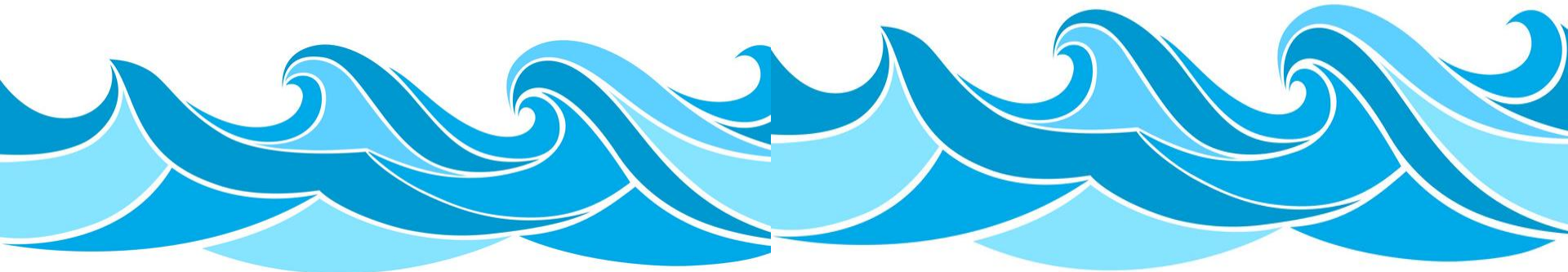
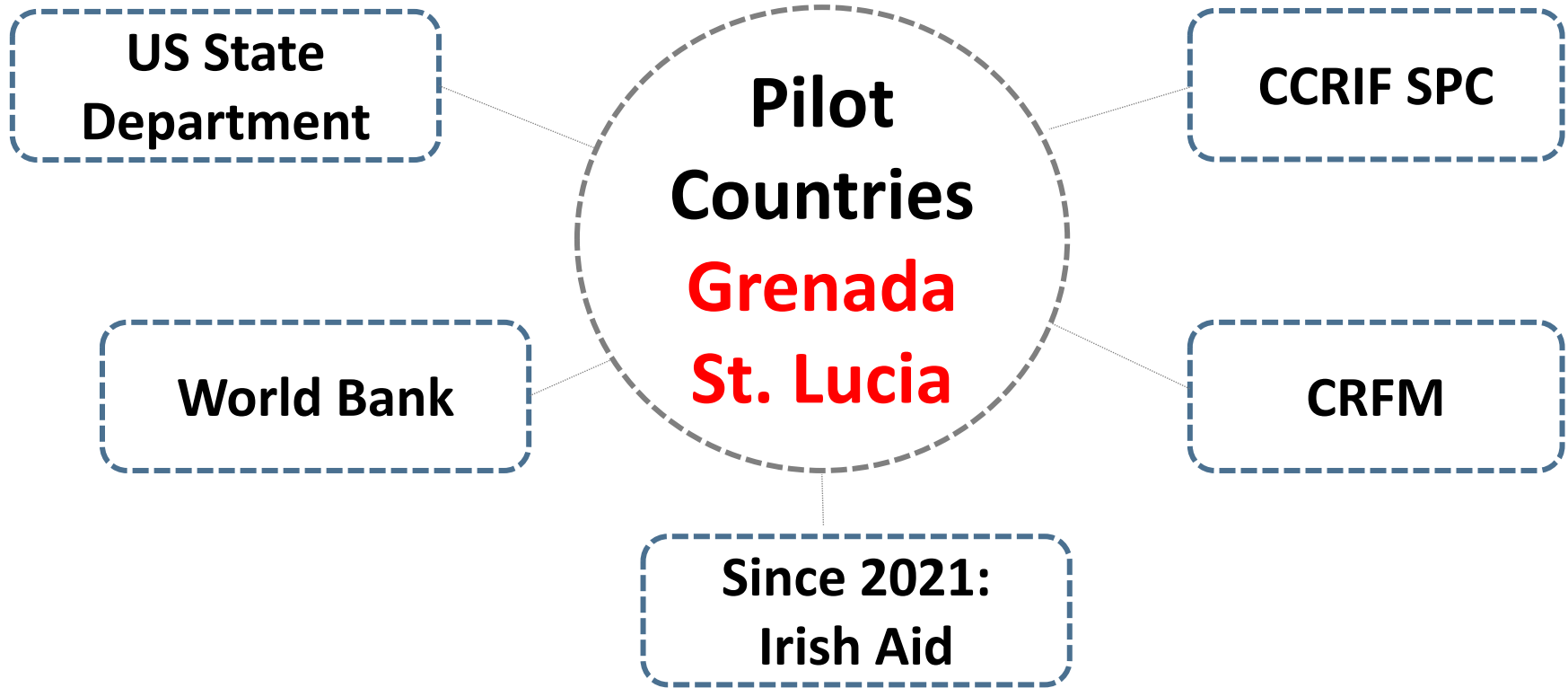


Promotes a culture of building back better to enhance coastal community resilience after an extreme weather event



The insurance policy and payouts are based on full transparency and accountability

COAST PARTNERSHIP



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.

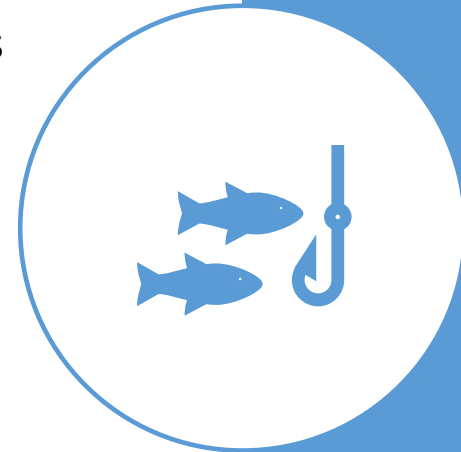
New partnerships developed to support COAST.

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.



Benefits and Opportunities from COAST

- Protecting fishers against natural hazards
- Providing basic compensation for the loss of, or damage to fishing vessels, gear and catch (or harvest), thus contributing to stabilization of incomes within the fisheries sector
- Reducing the unpredictable burden on government of providing emergency assistance to the fisheries sector in the wake of natural disasters
- Promoting stability in fishery enterprises and contributing to the general welfare of fishing communities
- Stabilizing the contribution of the fisheries sector to the national economy
- Reducing the risk to financial institutions that provide credit to fishers and fish farmers
- Reducing the risk for fishers and fish farmers in investing their own resources in the adoption of new technologies and acquiring improved equipment
- Fostering mutual assistance and cooperation among fishers, fish farmers and their organizations





COAST Technical Workshop and Consultation

Session 2:

Developing the COAST Model



CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility



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COAST – How does it work?

Parametric insurance product at a scale relevant to vulnerable fishing communities.

- The COAST parametric insurance product provides **cover for losses attributed to the fisheries sector due to unusually bad weather conditions, and/or high wind and storm surge caused by tropical cyclones** throughout the policy year. Bad weather is considered in a first tier, and tropical cyclones in a second and third tier.

C|O|A|S|T



Parametric Insurance

- Covers the probability of a predefined event happening (e.g., a major hurricane or earthquake), instead of indemnifying actual loss incurred and pays out according to a predefined scheme.
- Insures a policyholder against the occurrence of a specific event by paying a set amount based on the magnitude of the event, as opposed to the magnitude of the losses in a traditional indemnity policy.
- Makes a payment upon the occurrence of a triggering event and is detached from a specific underlying physical asset or piece of infrastructure.
- Make payments based on the intensity of an event (for example, hurricane wind speed, earthquake intensity, volume of rainfall) and the amount of loss calculated in a pre-agreed catastrophe model caused by these events



Characteristics of Parametric Insurance

- 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 or years
- Governments do not have to provide detailed asset values and other information prior to the insurance programme commencing
- Calculation of payouts is totally objective
- The risk, which drives policy pricing, is uniformly defined
- Subject to basis risk which means that events can occur which produce modelled losses that are different from losses on the ground



Differences Between Parametric and Indemnity (Traditional) Insurance

	Parametric Insurance	Indemnity Insurance
Lower Premiums	<ul style="list-style-type: none">• Lower transaction and administrative costs	<ul style="list-style-type: none">• Includes claim assessing costs
Faster Payouts	<ul style="list-style-type: none">• Payments based on a pre-defined hazard level	<ul style="list-style-type: none">• Need loss adjustment process• This requires additional time
Objective and Transparent	<ul style="list-style-type: none">• Direct access to information for policyholders• Objective payout calculation	<ul style="list-style-type: none">• Opinions on loss level depend on the adjuster• Conditions, exclusions and limitations often add uncertainty and delay
Uniformly Defined Risk	<ul style="list-style-type: none">• All risk is defined with the same parameters	<ul style="list-style-type: none">• Risk is valued under different assumptions depending on company parameters

Differences Between Parametric and Indemnity (Traditional) Insurance

	Parametric Insurance	Indemnity Insurance
Moral Hazard Reduction	<ul style="list-style-type: none">• Cost of insurance is related to event probabilities and payouts are not related to external efforts	<ul style="list-style-type: none">• Policyholders may engage in riskier actions
Simple Process to Obtain Coverage	<ul style="list-style-type: none">• Governments do not have to provide detailed asset values and locations	
Simplified Claims	<ul style="list-style-type: none">• Reversed claims process	<ul style="list-style-type: none">• Often claims processing takes a long time to be completed

How CCRIF Parametric Insurance Policies Work

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)

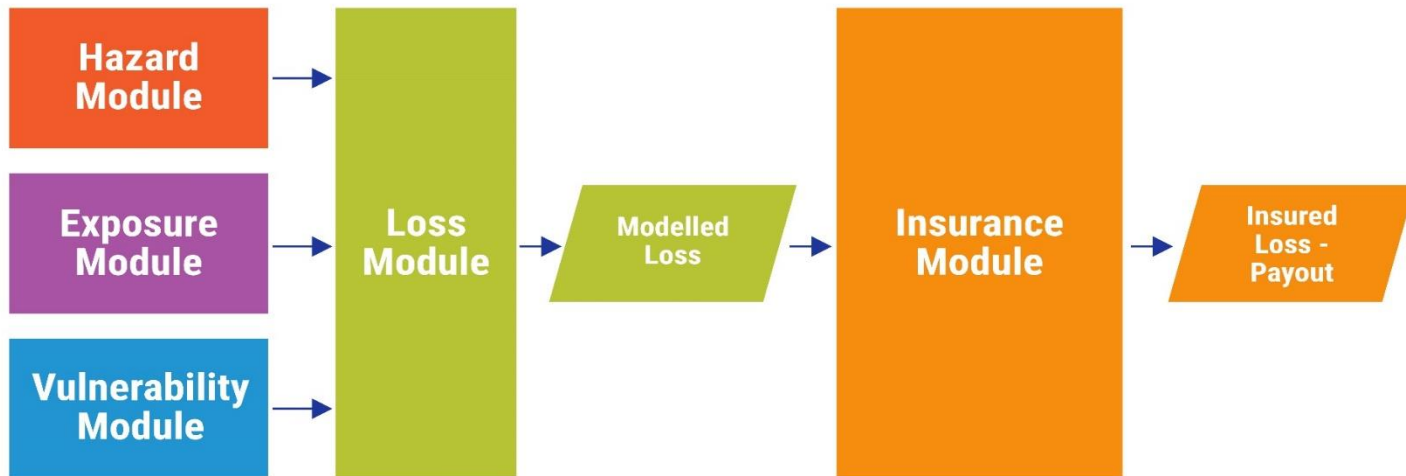
Hazard levels applied to pre-defined government exposure to produce a loss estimate

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

CCRIF makes payouts within 14 days after an event.

CCRIF's Parametric Model Construct

- CCRIF's parametric policies are based on a loss modelling approach. The objective of the loss modelling approach is to equip CCRIF with the capacity to estimate loss probabilities for individual countries, price contracts for specific countries, and estimate site-specific hazard levels and losses for specific events during the contract period.



CCRIF's Parametric Models – The Modules

Hazard

- Defines the expected frequency and severity of a hazard event at a specific location / computes real-time hazard parameters
- Based on a database of historical and simulated events
- EQ: 1520-2022
TC: 1850-2022
XSR: 1998-2022

Exposure

- Provides a comprehensive and spatially-distributed list of vulnerable assets e.g. buildings, airports/ports, power facilities, road networks, crops

Vulnerability

- Assesses the vulnerability of the assets in the exposure module to the hazards defined in the hazard module

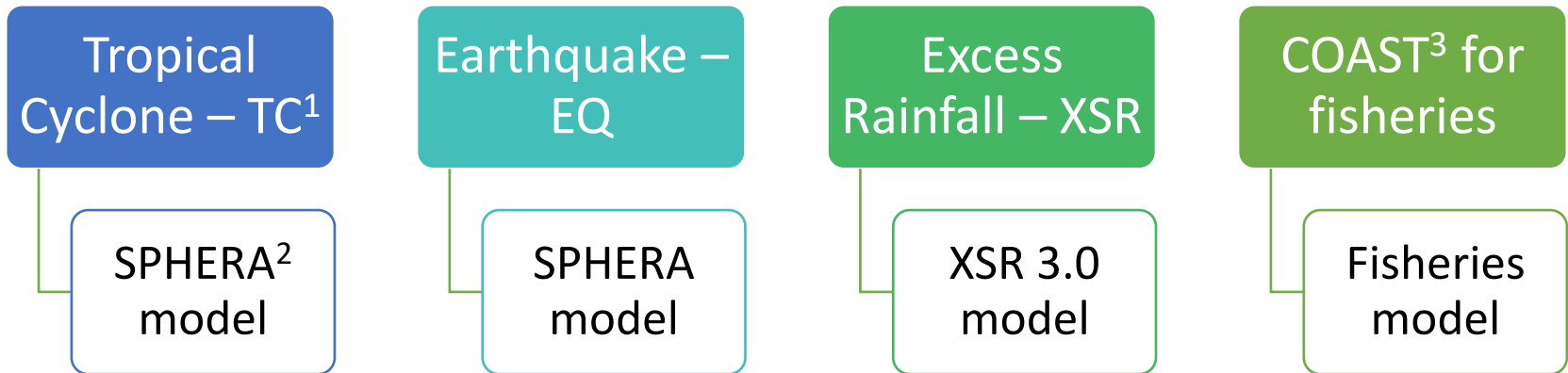
Loss

- Uses the Hazard, Exposure and Vulnerability modules to calculate a modelled loss for a current hazard event

Insurance

- Applies the modelled losses to the conditions of the country's CCRIF policy to determine if the policy is triggered and computes the payout to the country.

CCRIF's Parametric Products and Models



1. Used in Electric Utilities and COAST products also
2. System for Probabilistic Hazard Evaluation and Risk Assessment
3. Caribbean Oceans and Aquaculture Sustainability Facility

Fisheries Model for COAST

(Caribbean Oceans and Aquaculture Sustainability Facility)

This innovative Fisheries model, comprises two main components:

- 1. Adverse Weather (AW) Component:** (akin to business interruption) estimation of losses caused by adverse weather to fisherfolk that prevent them from carrying out their usual activities - which is related to the occurrence of high waves or heavy rainfall.
- 2. Tropical Cyclone (TC) Component:** calculation of direct damages by tropical cyclone events to fishing vessels, fishing equipment and other fisheries infrastructure, which is related to tropical cyclone-induced strong winds and storm surges.

Fisheries Model for COAST

**COAST
Fisheries
Model: Two
Independent
Components**

**Adverse
Weather**

Fisherfolk
economic activity
interruption

Wave height

Heavy
rainfall

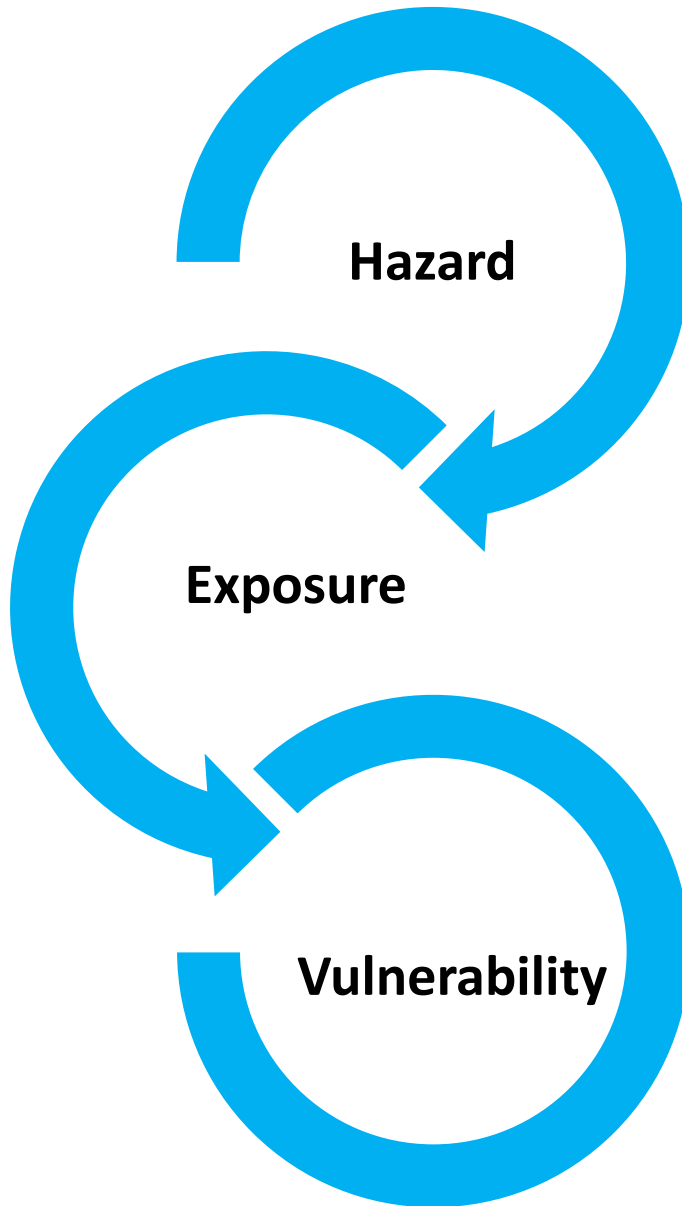
**Tropical
Cyclone**

Direct damages to
assets (*e.g.* boats,
equipment,
infrastructure, etc)

Wind speed

Storm surge

COAST Fisheries Model



- **Adverse Weather Component:** Wave height and strong rainfall (for at least 3 consecutive days)
- **Tropical Cyclone Component:** Wind speed and storm surge

Comprises infrastructure, boats and fisherfolk characteristics such as:

- Location
- Economic value (replacement cost/estimated income)
- Physical attributes (materials, dimensions)

- **Adverse Weather Component:** relates rainfall depth or wave height levels to daily lost revenues
- **Tropical Cyclone Component:** Relates wind/storm surge intensities to infrastructure damage ratios (%)

Fisheries Risk Model - Hazard

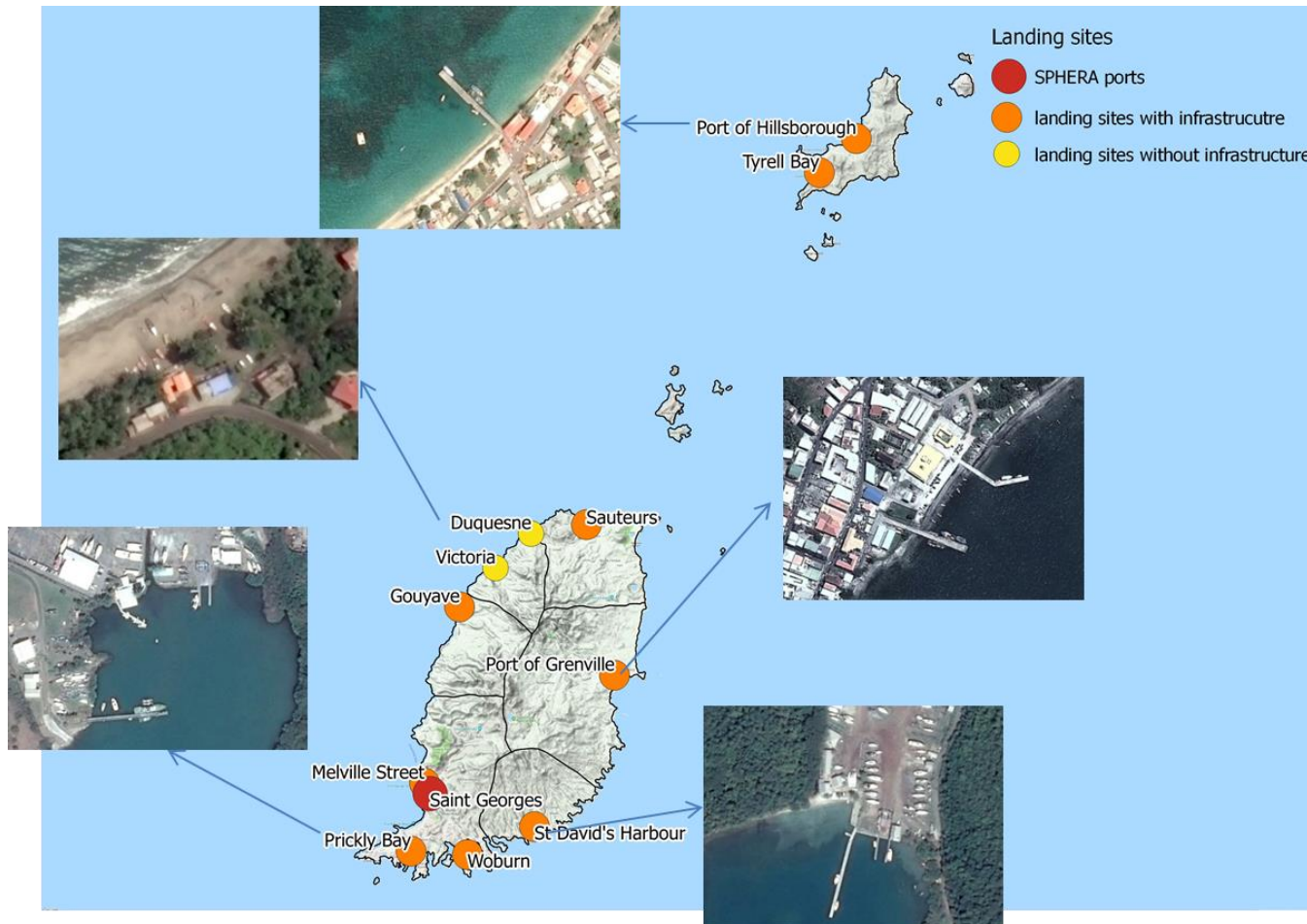
- Adverse weather component
 - Rainfall: 24-hr rainfall from CMORPH (NOAA) 8 km resolution (same used by the XSR model)
 - Waves: maximum daily significant wave height from GFS Wave (NOAA) 0.16° resolution
- Tropical cyclone component
 - Wind: maximum wind speed from SPHERA wind model
 - Storm surge: maximum storm surge height from SPHERA storm surge model

Fisheries Model for COAST- Exposure

The exposure database is a comprehensive and spatially distributed list of vulnerable assets

Asset Type	Description	Replacement Cost	Source of information
Infrastructure	<ul style="list-style-type: none"> Ports (large, medium, small) Landing sites (with infrastructure and land infrastructure only) <p>Both include sheds, warehouses, docks, harbors, gas station, marketplaces and offices among others</p>	<ul style="list-style-type: none"> SPHERA replacement costs corrected by GDP as a percentage of the total fishing activity 	<ul style="list-style-type: none"> Aerial surveys and photogrammetry Previous work on the SPHERA model Reports from local institutions
Vessels and fishing equipment	<ul style="list-style-type: none"> Boats (small, medium) 	<ul style="list-style-type: none"> Boat sale website 	<ul style="list-style-type: none"> Local information Government information shared with the World Bank FAO country reports CRFM
Fisherfolk	Fisherfolk (full and part time)	<ul style="list-style-type: none"> Historical value of daily catch to estimate daily business interruption GDP estimates 	<ul style="list-style-type: none"> Government information shared with the World Bank FAO country reports CRFM

Fisheries Risk Model - Exposure



For each country, there will be need to collect country-specific data for defining the exposure module thereby ensuring that the infrastructure inventory, vessel and fishing equipment inventory and fisherfolk inventory are captured in this module.

Fisheries Risk Model - Exposure

- Exposure database: infrastructure



Fisheries Risk Model – Exposure

For modelling purposes, each asset is represented as a single, georeferenced point. For example, all the components of a port (piers, warehouses, tanks, etc.) are condensed in a single point and all the fisherfolk based on a port/landing site are condensed in a single point. To collect data on the location of assets CCRIF will gather information from diverse sources such as:

- Ports and marine traffic databases (World Port Index, ISS World of Ports, marinetraffic.com, Global Fishing Watch)
- Previous work carried out within the development of the SPHERA model
- Reports from local and regional institutions (Ministries of Agriculture and Fisheries, the Caribbean Regional Fisheries Mechanism - CRFM, etc.)
- Local surveys, carried out by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) in partnership with the World Bank
- Aerial surveys and photogrammetry



Fisheries Risk Model- Exposure

- Exposure database: infrastructure



Fisheries Risk Model - Exposure

- Exposure database: boats and fishing gear



Fisheries Risk Model - Exposure

- Exposure database: business interruption
 - Loss of revenue to fisherfolk caused by adverse weather
- Sources
 - Fisheries census
 - Fisheries GDP and # employed
 - Revenue assessments
 - FAO
 - CRFM
 - Country data
 - National surveys related to the fisheries sector

What happens if we don't have the data? Can the model be built?

	Importance level	Alternative strategy in case data are missing
Number of landing sites (including ports)	2	Visual Assessment on Google Earth or similar
Location of landing sites (including ports)	2	Visual Assessment on Google Earth or similar
Infrastructures and assets of each landing site (including ports)	1	Visual Assessment on Google Earth or similar
Economic value of infrastructures and assets of each landing site (including ports)	1	Assumptions based on literature and previous work on COAST and SPHERA
Total number of fisherfolks (split between part- and full-time)	3	
Number of fisherfolks for landing site	2	Assumption based on landing site size and population maps
Total number of vessels by typology for each landing site	2	Assumption based on literature and visual assessment on Google Earth
Economic value of the different vessels type	1	Assumption based on market prices
Monthly economic value of fish landing for all landing sites for the longest period available	3	At least annual values are required and monthly distribution can be based on the type of catch and on data from other countries collected in previous work for COAST

Importance levels

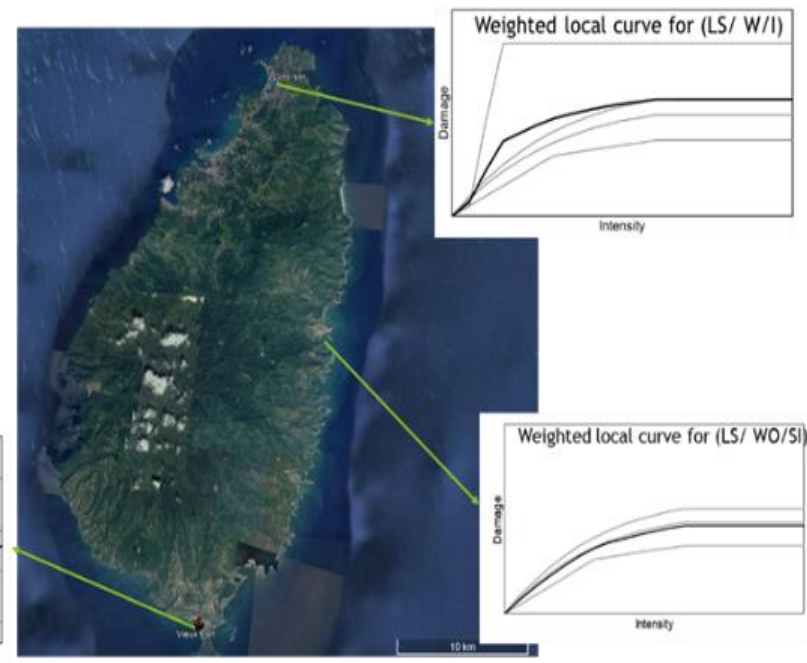
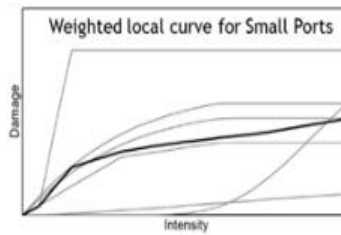
3 = Mandatory

2 = Alternative strategy exists but it reduce the robustness of the model

1 = Alternative strategy is effective especially considering the difficulties to get the data

Fisheries Risk Model

- Vulnerability
 - Adverse weather component
 - Damage levels can only be 0 or 1
 - Tropical cyclone component
 - Weighted curves depending on the infrastructure inventory carried out during the exposure development.
 - For every asset type, the number of each component was estimated through aerial surveys, and weights were assigned depending on its replacement cost.



Fisheries Risk Model - Loss

Loss computation

- Adverse weather component
 - If rainfall and/or wave height exceed certain thresholds: **adverse weather event**
 - 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 individual losses and then are **aggregated on a yearly basis** since the model aims to identify years with very bad weather and long interruptions of the fishing activities. Therefore events of fewer than 3 days are not considered in the total account of annual losses.

Fisheries Risk Model - Loss

Loss computation

- Tropical cyclone component
 - Modelled losses are calculated using the same methodology as for the Tropical Cyclone model in SPHERA.
 - For each type of asset in the fisheries exposure database, the modelled loss is calculated based on the vulnerability to wind and storm surge – using the vulnerability curve - for that type of asset. Country losses are obtained by summing the losses for each asset type.
 - Event-based

How CCRIF Policies are Triggered and Payouts Calculated – COAST

Adverse
Weather
(AW)
Tier 1

Tropical
Cyclone
(TC)
Tiers 2 and 3

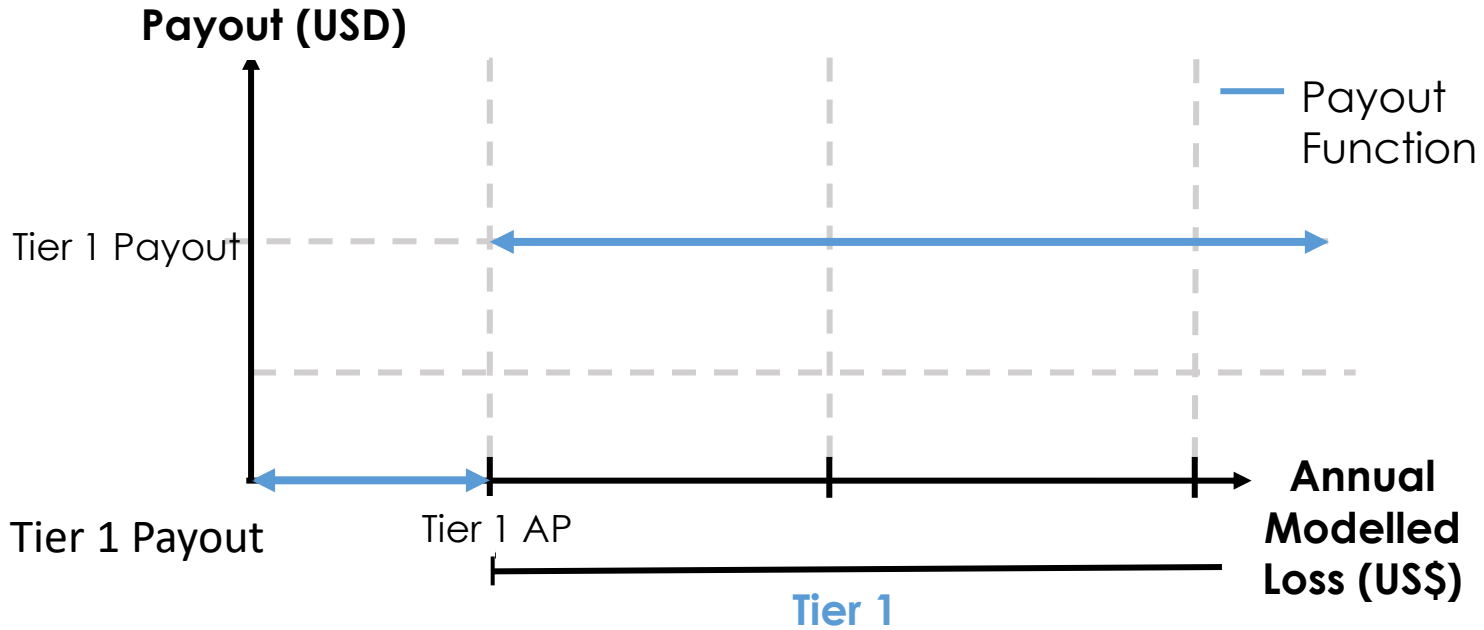
The COAST parametric insurance product follows a three-tier payment scheme organized as follows:

- **Tier 1** consists of a lump sum payment once an annual aggregate deductible threshold (the Tier 1 Attachment Point - AP) is met using the Adverse Weather component.
- **Tier 2** consists of a lump sum payment provided if a Tropical Cyclone event loss falls within a defined interval (greater than Tier 2 AP and up to Tier 3 AP).
- **Tier 3** provides a lump sum payment if a Tropical Cyclone event loss is above the Tier 3 AP

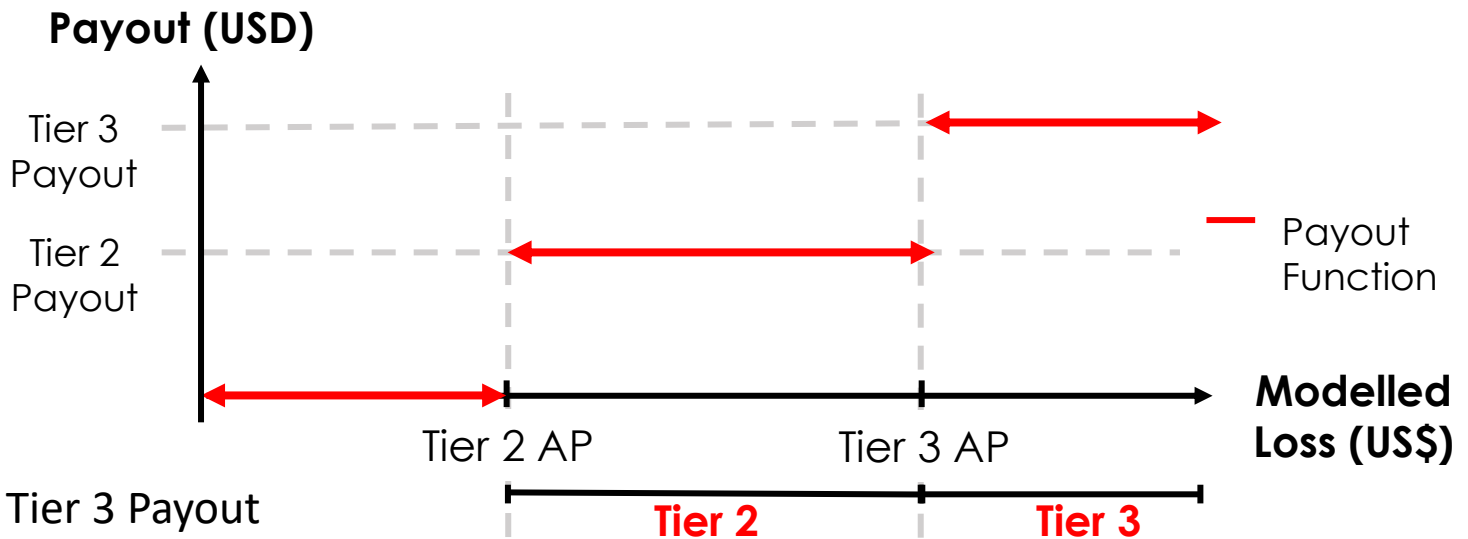
Since Tier 1 is based on a different model component from Tiers 2 and 3, the payouts are estimated independently. For a given event, a country can receive a payout under the AW component or the TC component or both.

COAST Payouts

Adverse Weather Component



Tropical Cyclone Component

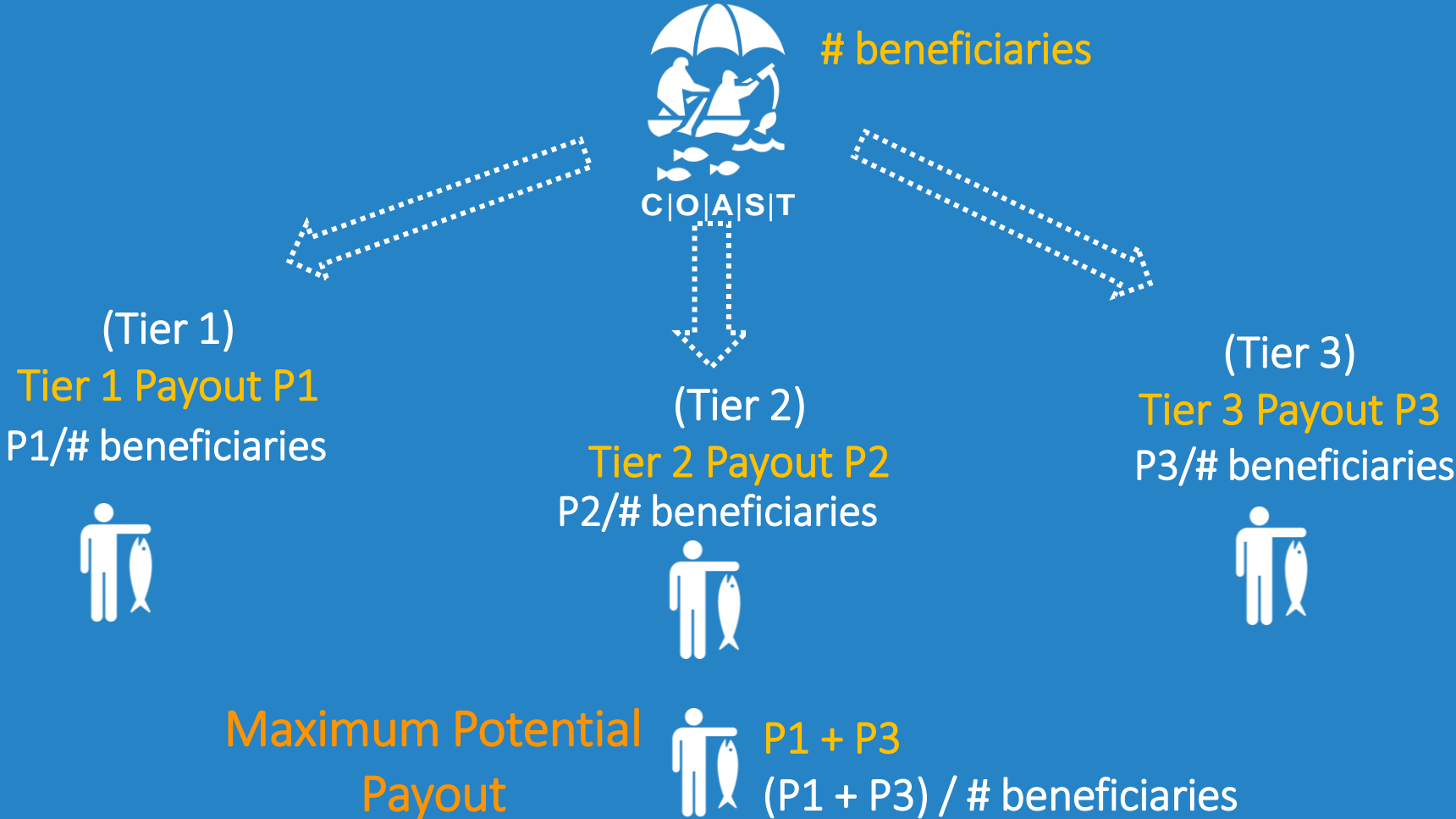


Dissemination of COAST Payouts

- If a country's policy is triggered, the funds are provided by CCRIF to the Ministry of Finance, followed by a rapid transfer to the fisherfolk and other affected parties.
- To facilitate timely transfer of funds, the list of beneficiaries is defined at the time of policy inception by the government and specified in a COAST Operations Manual for the country.
- The list is designed to include beneficiaries from the fisheries value chain, including fishers, crew members, captains, boat owners, fish vendors and processors, etc.

The COAST product acts like a microinsurance livelihood protection product.

COAST Payout Structure



COAST Policy

Sample policy

COAST	
Gross premium (US\$)	\$100,000
Net Premium (US\$)	\$100,000
Adverse Weather Component (Tier 1)	
Tier 1 Trigger* return period (years)	5
Tier 1 Modeled loss trigger* (US\$)	\$700,000
Tier 1 Payout (US\$)	\$175,000
Tropical Cyclone Component (Tiers 2 & 3)	
Tier 2 Trigger* return period (years)	10
Tier 2 Modeled loss trigger* (US\$)	\$250,000
Tier 2 Payout (US\$)	\$225,000
Tier 3 Trigger* return period (years)	40
Tier 3 Modeled loss trigger* (US\$)	\$2,000,000
Tier 3 Payout (US\$)	\$650,000

*Attachment Point (AP)



COAST Technical Workshop and Consultation

Session 3:

Operationalizing COAST



CCRIF SPC
The Caribbean Catastrophe Risk Insurance Facility



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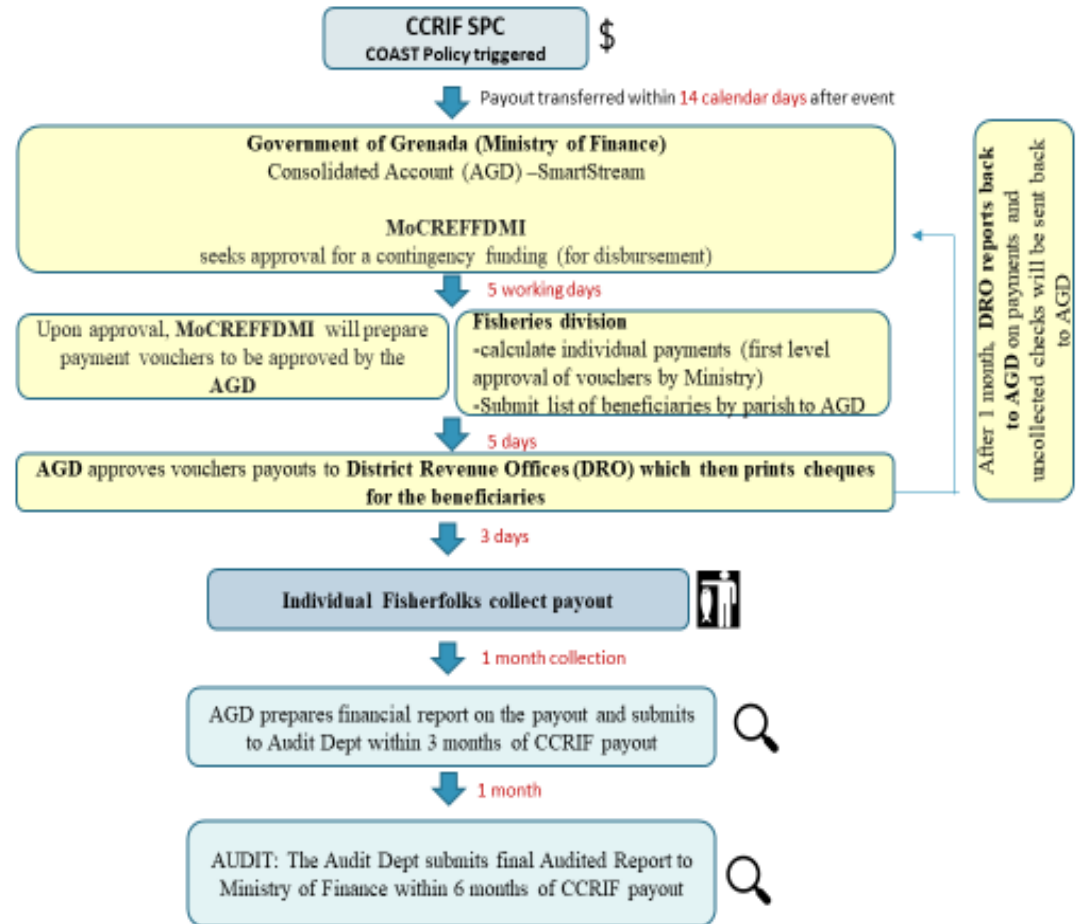
COAST Operational Plan – A Snapshot...

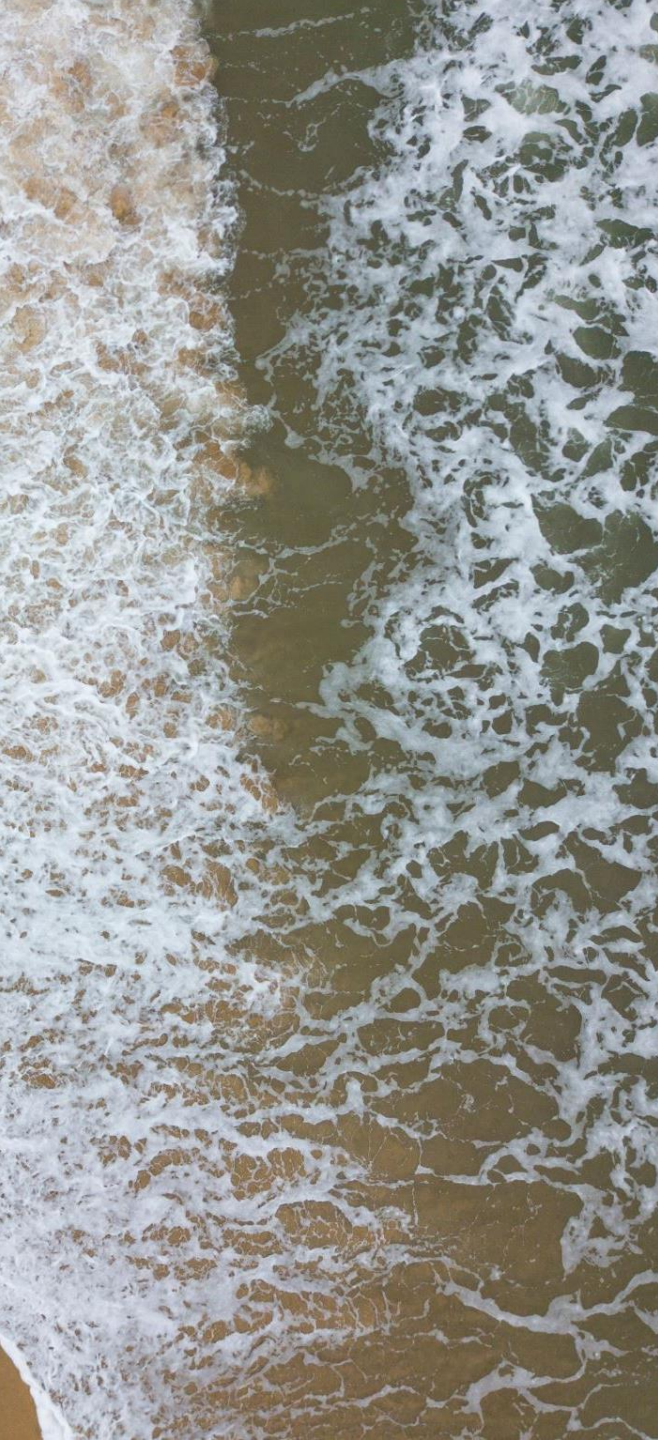
What is included?

- **Purpose of the Operational Manual**
- **COAST Objective**
- **National Fisheries Context**
- **COAST Parametric Insurance**
- **Beneficiaries of COAST**
 - Definition of beneficiaries
 - Method for identifying COAST beneficiaries
 - Process and rules for periodic updates and populating the beneficiaries' list, and the flow of this information to the institution or unit delivering the payouts
- **Premium and Guidelines for Purchasing Coverage**
- **COAST Implementation Arrangements**
 - Roles and responsibilities of Institutions implementing COAST
 - Training to implement COAST
- **COAST Payout Plan-Cash Transfer**
- **Social and Environmental Safeguards – any risks?**
- **Monitoring, Evaluation and Reporting**
 - M&E arrangements for both payouts and fisheries management activities

COAST Operational Plan – A Snapshot of the Administration of Payouts

Payout procedure for Grenada: transparency and accountability



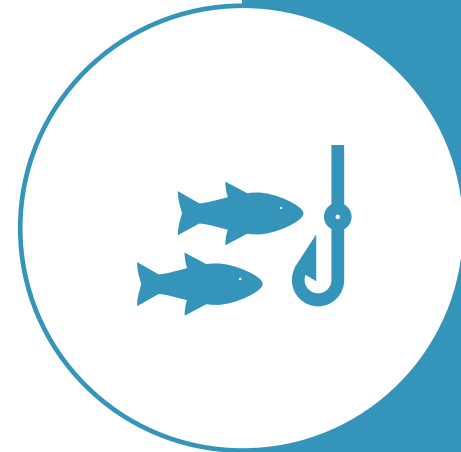


Other Key Elements of COAST – Fisheries Action Plan for Premium Reduction Activities

- The development of a fisheries action plan to support the resilience and sustainability of the fisheries sector
- This plan will provide a set of proposed actions or initiatives that countries could put in place to enhance the sustainability of the sector.
- The action plan will draw heavily on and be aligned to the Caribbean Community Common Fisheries Policy (CCCFP) that is part of the CRFM Framework to support the governance of the fisheries sector in the region.
- Whilst the implementation of the action plan would result in a more resilient and sustainable fisheries sector in a country, it would also be aligned to COAST as the intent is to use the reduction in vulnerability as a mechanism to reduce COAST policy premiums.
- The action plan will provide a list of directives and recommendations to advance the sustainable management and use of the ecosystems that support the fisheries sector and draws on the CCCFP as the strategic framework. These actions are also intended to contribute to the achievements of the objectives as listed in the CCCFP.

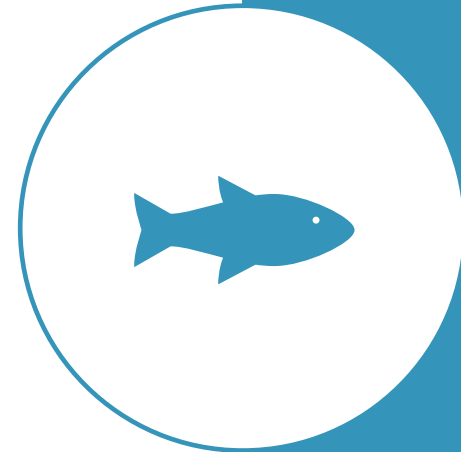
Other Key Elements of COAST – Fisheries Action Plan for Premium Reduction Activities

- Well defined data on all aspects of the fisheries sector, including aquaculture
- Strategies to increase registration of fishers, gear, and vessels and increase the reporting of catch and landing data to promote – *inter alia* – ecologically sustainable, science-based fisheries management.
- Framework/scorecard that will assist in assessing progress towards the achievement of the objectives set out in the CCCFP – this would become a useful monitoring and evaluation tool for countries in keeping with the regional sustainability agenda
- Strengthening of fisheries cooperatives / associations to promote – *inter alia* – co-management of fisheries resources.
- Ecosystem-based solutions to support the sustainable management of the ecosystems that support the fisheries sector

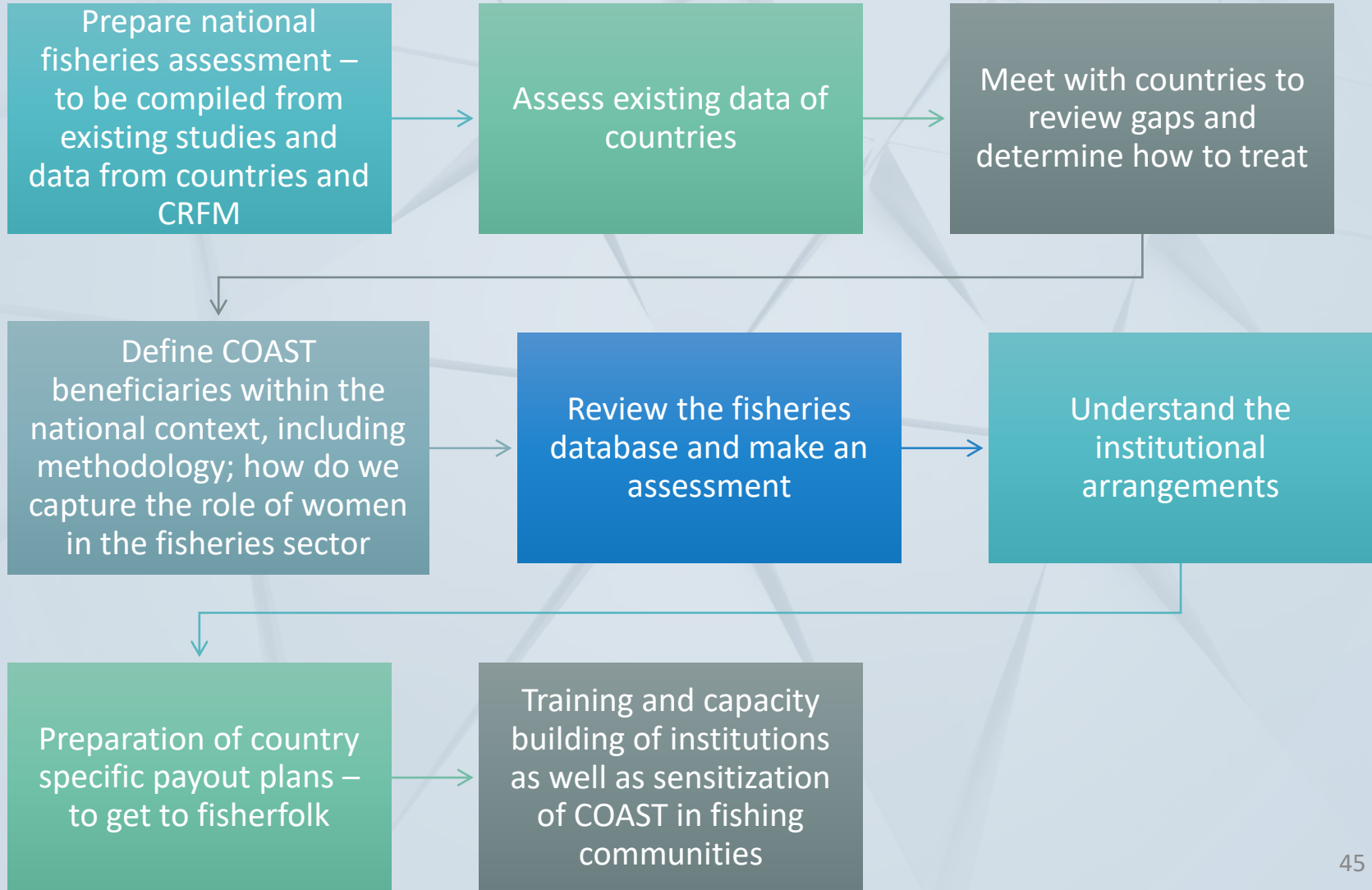


Other Key Elements of COAST – Fisheries Action Plan for Premium Reduction Activities

- Establishment of fish sanctuaries and marine protected areas as well as appropriate management plans
- Allocating resources for enforcement activities
- Working with fishing communities to identify best practices in fisheries management and sharing experiences and lessons learned with other fishing communities nationally and regionally
- Recognition and support for the role that women play in the fisheries sector and how they too can be supported, empowered and their capacities built especially in areas related to food storage and sanitation, small business development and also in other areas of business and food processing
- Work with communities to assess financing for small scale-projects in the areas of disaster risk management, climate change adaptation, ecosystem-based solutions (CCRIF Small Grants Programme)
- Development of value-added fish-based products, new market networks targeting sustainably-harvested products, and complementary livelihoods and capacity-building programmes for fisheries to help supplement income and encourage sustainable fishing.
- Development of bio-tourism and conservation schemes supporting the overall objectives of COAST.
- Climate-smart food security strategies



Next Steps for COAST Model Development





Engage With Us:



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