

Document of
The World Bank

Report No: ICR00002332

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(P108058)

ON A

GRANT
IN THE AMOUNT OF US\$70,997,902.39

TO THE

CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

FOR A

CARIBBEAN CATASTROPHE RISK INSURANCE PROJECT

July 12, 2012

Sustainable Development Department
Caribbean Country Management Unit
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

Currency Unit = US\$

FISCAL YEAR
June 1 to May 31

ABBREVIATIONS AND ACRONYMS

AAL	Average annual loss
AFD	<i>Agence Française du Développement</i> (French Development Agency)
CARICOM	Caribbean Community and Common Market
CARILEC	Caribbean Electrical Utility Service Corporation
CCCCC	Caribbean Community Climate Change Centre
CCRIF	Caribbean Catastrophe Risk Insurance Facility (the “Facility”)
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive disaster management
CEA	California Earthquake Authority
CIDA	Canadian International Development Agency
CIMA	Cayman Islands Monetary Authority, CCRIF’s regulator
CIMH	Caribbean Institute for Meteorology and Hydrology
COFAP	CARICOM Council for Finance and Planning
DFA	Dynamic Financial Analysis, the model CCRIF uses to assess its financial sustainability
DFID	United Kingdom Department for International Development
DRM	Disaster risk management
ECA	Economics of Climate Adaptation
EU	European Union
GEF	Global Environmental Facility
HLEM	Hazard and loss estimation model
IBRD	International Bank for Reconstruction and Development (part of the World Bank Group)
IBTF	Initiating Brief for Trust Fund
ICR	Implementation Completion and Results Report
IDA	International Development Association (part of the World Bank Group)
ISR	Implementation Status and Results Report
JSIF	Jamaican Social Investment Fund
KAC	Kinetic Analysis Corporation
MCII	Munich Climate Insurance Initiative
MDTF	Multi-donor Trust Fund
MOP	Memorandum of the President of the World Bank to the Board of Executive Directors
NHC	U.S. National Hurricane Center

NMHS	A national meteorological and hydrological service
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
PAD	Project Appraisal Document
PDO	Project Development Objective
PHRD	Policy and Human Resources Development grant, a program of the Government of Japan
PML	Probable maximum loss
RTFS	Real Time Forecasting System, a proprietary storm forecasting system developed by Kinetic Analysis Corporation
SRC	Seismic Research Centre, University of the West Indies
TA	Technical assistance
UN-ECLAC	United Nations Economic Committee for Latin America and the Caribbean
UNEP	United Nations Environmental Program
USAID	U.S. Agency for International Development
USGS	U.S. Geological Survey
UWI	University of the West Indies

Vice President: Hasan Tuluy
 Country Director: Françoise Clottes
 Sector Manager: Anna Wellenstein
 Project Team Leader: Niels Holm-Nielsen
 ICR Team Leader: Niels Holm-Nielsen

CARIBBEAN REGION
Caribbean Catastrophe Risk Insurance Facility

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MAP IBRD 39282	

A. Basic Information			
Country:	Caribbean	Project Name:	Caribbean Catastrophe Risk Insurance Facility
Project ID:	P108058	L/C/TF Number(s):	TF-58302
ICR Date:	07/12/2012	ICR Type:	Core ICR
Lending Instrument:	SIL	Grantee:	CCRIF
Original Total Commitment:	USD 24.00M	Disbursed Amount:	USD 71.00M
Revised Amount:	USD 71.00M		
Environmental Category: C			
Implementing Agencies: Caribbean Catastrophe Risk Insurance Facility			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	02/15/2007	Effectiveness:		07/03/2007
Appraisal:		Restructuring(s):		11/11/2008 10/25/2010 10/03/2011
Approval:	04/26/2007	Mid-term Review:	07/31/2008	12/01/2008
		Closing:	01/16/2012	01/16/2012

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Highly Satisfactory
Risk to Development Outcome:	Low or Negligible
Bank Performance:	Satisfactory
Grantee Performance:	Highly Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Highly Satisfactory	Government:	Not Applicable
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Not Applicable
Overall Bank Performance:	Satisfactory	Overall Borrower Performance:	Highly Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Non-compulsory pensions and insurance	100	100
Theme Code (as % of total Bank financing)		
Other financial and private sector development	100	100

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Hasan A. Tuluy	Pamela Cox
Country Director:	Francoise Clottes	Caroline D. Anstey
Sector Manager:	Anna Wellenstein	John Henry Stein
Project Team Leader:	Niels B. Holm-Nielsen	Francis Ghesquiere
ICR Team Leader:	Niels B. Holm-Nielsen	
ICR Primary Author:	Todd W. Crawford	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The PDO was stated in the Initiating Brief for a Trust Fund (IBTF), approved March 2, 2007, as follows:

- The Trust Fund supports the creation and operation of the CCRIF, which will allow Caribbean countries access to natural catastrophe risk insurance at affordable rates.

Revised Project Development Objectives (as approved by original approving authority)

As further specified for the purposes of the Implementation Status and Results Reports (ISR), the PDO was stated as:

□ The development objective of the Trust Fund is to support the Caribbean Catastrophe Risk Insurance Facility in order to reduce the Caribbean countries financial vulnerability to natural disasters (earthquakes and hurricanes). The fund finances CCRIF's establishment costs, operating expenses and insurance payouts. This results in a significant reduction of insurance premiums and provides stability to CCRIF until it becomes self-sustainable.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Establishment of the Facility by end March 2007, and natural catastrophe risk coverage provided to participating countries for the Hurricane Seasons 2007, 2008, 2009 and 2010.			
Value quantitative or Qualitative)	CCRIF not yet established.	Establishment of the Facility by end March 2007, and natural catastrophe risk coverage provided to participating countries for the Hurricane Seasons 2007, 2008, 2009 and 2010.		Establishment of the Facility by end March 2007, and natural catastrophe risk coverage provided to participating countries for the Hurricane Seasons 2007, 2008, 2009, 2010 and 2011.
Date achieved	02/06/2007	12/31/2010		01/16/2012
Comments (incl. % achievement)	PDO indicator taken from the approved IBTF. The IBTF did not specify a target value. The actual value is as of the date the Grant closed.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Total claims paying capacity of CCRIF			
Value (quantitative or Qualitative)	0	US\$110 million		US\$150 million (See comment)
Date achieved	02/06/2007	12/31/2010		01/16/2012
Comments (incl. % achievement)	The IBTF did not specify an intermediate outcome indicator. The "original target value" is taken from the ISRs. The actual value is for the insurance year June 1, 2011, to May 31, 2012.			

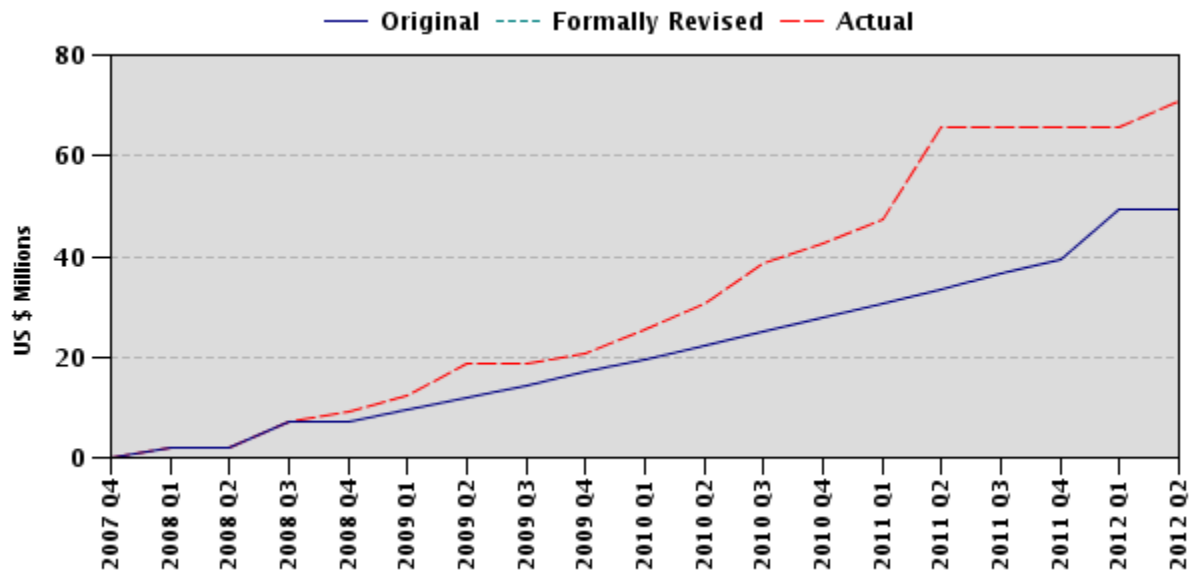
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	06/12/2008	Satisfactory	Satisfactory	9.30
2	11/07/2008	Satisfactory	Satisfactory	12.27
3	03/31/2009	Satisfactory	Satisfactory	18.57
4	10/12/2009	Satisfactory	Satisfactory	25.38
5	01/30/2010	Satisfactory	Satisfactory	38.34
6	05/21/2010	Moderately Satisfactory	Moderately Satisfactory	42.77
7	02/13/2011	Moderately Satisfactory	Satisfactory	65.86
8	09/06/2011	Satisfactory	Satisfactory	65.86

H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
11/11/2008	N	S	S	12.27	To increase the Grant from US\$24 million to US\$50 million.
10/25/2010		MS	MS	49.74	To add US\$20 million.
10/03/2011		S	S	65.86	To add the remaining US\$0.998 million.

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. The Hyogo Framework for Action 2005-2015 provides a global blueprint for disaster risk reduction and identifies the need to “promote the development of financial risk-sharing mechanism, particularly insurance and reinsurance against disasters,” as a priority action for “Building the Resilience of Nations and Communities to Disasters.” This recommendation is particularly relevant to Caribbean countries, which are highly exposed to adverse natural events, including hurricanes, earthquakes, and excess rainfall. On average, at least one major hurricane and numerous tropical storms cross the Caribbean each year. From 1979 to 2005, aggregate economic losses due just to storms were estimated at US\$16.6 billion – US\$613 million annually. Averages, however, disguise the extreme losses that can occur overnight. Damage to Grenada alone from just one of the major tropical storms in the Caribbean in 2004, Hurricane Ivan, was calculated at US\$800 million. The combined damage from Ivan and the three other major hurricanes that wreaked havoc in the Caribbean in the same year – Hurricanes Charley, Frances and Jeanne – totaled more than US\$4 billion.
2. Large economies can absorb the economic impact of major disasters, as the resulting damage, however large in absolute terms, is equal to a small share of GDP and the funds required for recovery, a small share of the government budget. For example, the damage to Louisiana and other Gulf Coast states caused by Hurricane Katrina in 2005 amounted to US\$125 billion, only 1.1 percent of U.S. GDP for that year¹; the US\$83 billion appropriated by the U.S. Congress in its wake hardly registered on the federal budget.
3. The same cannot be said of small island economies, such as in the Caribbean, where the damage can easily constitute a multiple of GDP (See Table 1). The capacity of the Caribbean countries individually to absorb the financial impact of such disasters is limited by a number of factors. Their small geographic size prevents diversification of their risk. The modest scale of their fiscal revenues makes establishing a financial reserve unaffordable and their small budgets constrain opportunities for reallocating resources to meet immediate needs; in any case, reallocation takes time.² Their possibilities for financial risk transfer through affordable catastrophe insurance in traditional international insurance and reinsurance markets are limited by the high transaction costs that result from the limited volume of business they could bring to these markets. The high levels of their government debt constrain their access to credit in international capital markets and their domestic capital markets lack sufficient depth to meet their needs following a catastrophe. And, finally, such donor

¹ World Development Indicators database, World Bank. GDP = GDP at purchaser's prices in current dollars.

² While larger countries generally have the flexibility to reallocate up to 5 percent of their budgets within a current year to meet extraordinary needs, for the small island countries in the Caribbean such scope is on the order of only 1 percent.

assistance as they may receive to support relief and recovery, with the exception of in-kind humanitarian assistance, comes with a delay, often results from a reprogramming that reduces funds for other development activities, and is normally tied to specific expenditures.

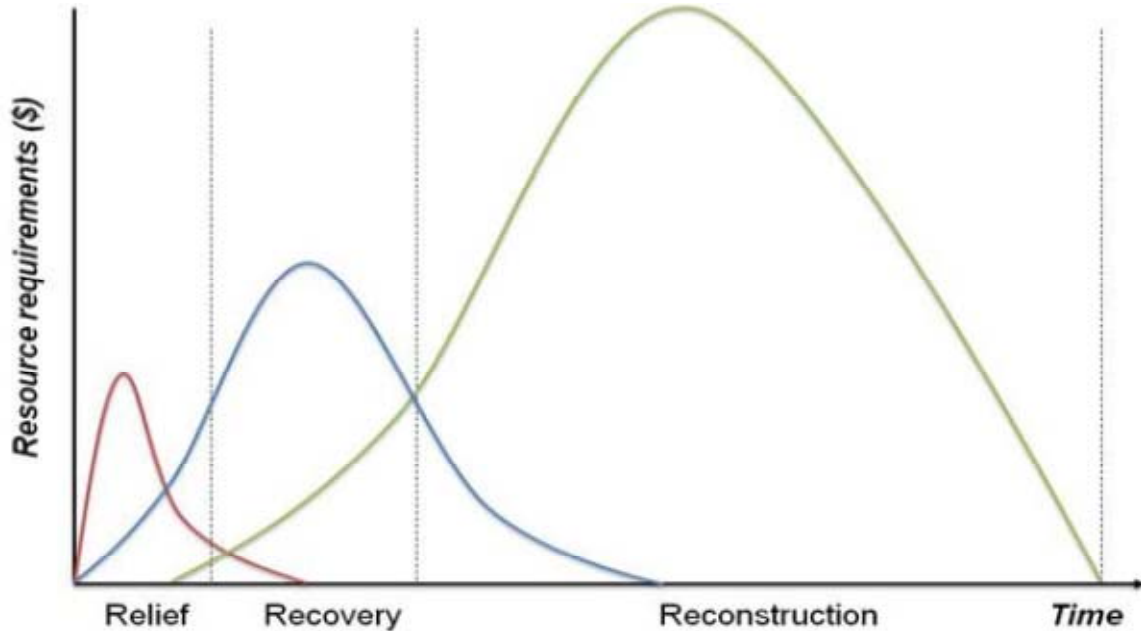
Table 1: Losses from Major Disasters in the Last 40 Years³

Year	Natural Disaster	Country	Region	Estimated Direct Loss (nominal US\$ million)	Direct Loss (% of GDP)
Large Economies					
1992	Hurricane Andrew	USA	North America	265,000	0.4
1995	Earthquake	Japan	East Asia	100,000	3.2
1998	Flood	China	East Asia	30,000	0.7
2005	Hurricane Katrina	USA	North America	125,000	1.1
Small Island Economies					
1985	Cyclones Eric & Nigel	Vanuatu	Oceania	173	143
1990	Cyclone Ofa	Samoa	Oceania	200	178
1991	Cyclones Val & Wasa	Samoa	Oceania	278	248
2004	Hurricane Ivan	Grenada	Caribbean	889	203
2009	Tsunami	Samoa	Oceania	120	22
2010	Earthquake	Haiti	Caribbean	8,000	114

4. What the small island countries in the Caribbean particularly lack is ready access to untied liquidity to support relief in the immediate aftermath of a natural disaster. In the initial relief stage, humanitarian supplies need to be distributed, debris need to be cleared, people need to be rescued, sites may need to be prepared for emergency housing, vital public services, such as water and power, need to be restored in however makeshift and temporary a fashion, and a strategy to finance the much greater costs of the medium-term recovery and longer-term reconstruction phases needs urgently to be formulated. All of these activities entail extraordinary costs for materiel, fuel, overtime for government emergency utilities and public works staff, etc. Figure 1 illustrates the three phases for which financing must be mobilized – initial relief, medium-term recovery, and longer-term reconstruction.

³ From “Financial Protection of the State against Natural Disasters,” Policy Research Working Paper 5429; Francis Ghesquiere & Olivier Mahul; the World Bank; September 2010.

Figure 1: Main Phases of Post Disaster Funding Needs⁴



5. The World Bank already had a significant history of experience with supporting efforts of countries in the Caribbean and elsewhere to strengthen their disaster risk management strategies and recover from hurricanes and earthquakes.⁵ In view of this history, following the devastation caused by Hurricane Ivan and the other major tropical cyclones in 2004, the Caribbean Community and Common Market (CARICOM) Heads of State requested the World Bank’s assistance in devising and creating a structure that would help the Caribbean countries address the constraints described above by providing them with access to affordable insurance coverage against potential revenue losses from natural disasters, thereby reducing their financial vulnerability to such disasters.

1.2 Original Project Development Objectives (PDO) and Key Indicators

6. Given World Bank policies prevailing in 2007 with respect to Bank-administered trust funds, the usual Project Appraisal Document (PAD) that would have been done for an investment project was not required or prepared for the project. Instead, an Initiating Brief for a Trust Fund (IBTF) was prepared for Management’s decision, setting forth the following PDO and key indicators.⁶

⁴ Ibid.

⁵ See for example Annex 2, “Major Related Projects,” in the Project Appraisal Document for the four Catastrophe Insurance Projects for the Organization of Eastern Caribbean States; February 6, 2007; Report No: 38539-LAC.

⁶ IBTF 2115 (approved); March 2, 2007. Project documentation for the Board of Executive Directors consisted of: (i) a Memorandum of the President (MOP) to the Board of Executive Directors, “Proposed

PDO

7. The purpose of the Trust Fund was to support the establishment and operations of CCRIF, a catastrophe risk mitigation facility for which no precedent or model existed, in order to reduce members' financial vulnerability to natural disasters. The PDO was stated simply in the approved IBTF as follows:
 - The Trust Fund supports the creation and operation of the CCRIF, which will allow Caribbean countries access to natural catastrophe risk insurance at affordable rates.

Key Indicators

8. The IBTF specified the following key indicator:
 - Establishment of the Facility by end March 2007, and natural catastrophe risk coverage provided to participant countries for the Hurricane Seasons 2007, 2008, 2009, and 2010.

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

9. After CCRIF's establishment, the PDO and Key Indicators were further specified in Implementation Status and Results Reports (ISR) in order to guide supervision. As these revisions are more specific, they will be used for the rest of this Implementation Completion and Results Report (ICR).

Revised PDO

- The development objective of the Trust Fund is to support the Caribbean Catastrophe Risk Insurance Facility (CCRIF) in order to reduce the Caribbean countries' financial vulnerability to natural disasters (earthquakes and hurricanes). The fund finances CCRIF's establishment costs, operating expenses and insurance payouts. This results in a significant reduction of insurance premiums and provides stability to CCRIF until it becomes self-sustainable.

Revised Key Indicators

- PDO-level indicator: Countries are eligible for insurance payment (and have received payment in case of an insured event).

Transfer of IBRD Surplus to Support a Caribbean Catastrophe Risk Insurance Facility," February 9, 2007; and a Board of Governors Resolution No. 585, "Transfer from Surplus to Fund the Caribbean Catastrophe Risk Insurance Facility Trust Fund," which was adopted April 23, 2007, to execute the US\$10 million transfer.

- Baseline: CCRIF not yet established
- End-of-Project Target Value: Participation fee paid and insurance policy purchased
- Intermediate outcome indicator – Total claims paying capacity of CCRIF
 - Baseline: 0
 - End-of-Project Target Value: US\$110 million

1.4 Main Beneficiaries

10. The primary beneficiaries of CCRIF are the 16 member governments. They benefit from: (i) being able to transfer a portion of their hurricane and earthquake risk to the Facility at a price lower than what they would pay if they were able to obtain coverage individually in international insurance markets or the cost of the capital they would need to hold or obtain in order to self insure; and (ii) from receiving a prompt cash payout, within two weeks or less, following a covered event. A secondary benefit might be more favorable investor sentiment, particularly in the tourism sector, stimulated by investors' greater confidence in the governments' disaster risk management strategy and ability to overcome quickly the damage caused by the disaster; but such a benefit is difficult to measure and is not assessed in this ICR.
11. As CCRIF has consolidated its standing as a Caribbean institution and broadened the scope of its activities, others have also benefited. It has entered into partnership agreements for support to and collaborative work with several CARICOM organizations, signing Memoranda of Understanding (MOUs) with: (i) the Caribbean Institute of Meteorology and Hydrology (CIMH); (ii) the Caribbean Disaster Emergency Management Agency (CDEMA); (iii) the Caribbean Community Climate Change Centre (CCCCC); (iv) the United Nations Economic Committee for Latin America and the Caribbean (UN-ECLAC); (v) the Seismic Research Centre (SRC) at the University of the West Indies (UWI); and, recently, (vi) the Secretariat of the Organization of Eastern Caribbean Countries (OECS). Collaborative activities are designed not only for the mutual benefit of CCRIF and the partner institution, but also to contribute broadly to supporting efforts of CCRIF members to strengthen their disaster risk management policies and practices. Section 2.2 amplifies on these mutual benefits.
12. A number of officials from member country agencies – e.g., ministries of finance, departments of insurance supervisors, national disaster management offices, and national meteorological and hydrological services (NMHS) – have benefited from CCRIF's support for their participation in a range of professional development activities sponsored by CCRIF itself or by others, such as CIMH and CDEMA. Finally, undergraduate and graduate-level students have benefited from CCRIF scholarships for studies in insurance, disaster risk management, civil and environmental engineering, geology and geography, and related fields.

1.5 Original Components

13. The IBTF specified two components:

1. Establishment of CCRIF – US\$500,000
2. CCRIF Operations – US\$30,421,170.50

14. With respect to the second component, eligible expenditures were:

- a. professional service fees, banking initiation fees, and registration fees, including related travel expenses incurred by the Recipient in connection with establishment of the Facility;
- b. administrative fees, professional fees, audit costs, exchange rate costs, banking fees, reinsurance premia, and remuneration and travel expenses of Board members of the Facility incurred by the Recipient in operating the Facility;
- c. insurance payouts of the Facility, to the extent that such payouts are not covered by any reinsurance purchased by the Recipient; and
- d. such other operational expenses of the Facility agreed with the World Bank.

15. Specific professional fees for which CCRIF received funding from the Grant were those for: (i) the members of the Board of Directors; (ii) the Facility Supervisor; (iii) the Insurance Manager; (iv) the Reinsurance Broker; (v) the Corporate Communications Consultant; and (vi) the External Auditor. CCRIF has financed its research and development, partnership, capacity building, and scholarship activities out of its own investment income.

16. The project was financed by a Multi-donor Trust Fund (MDTF), which was established to support CCRIF's initial operations.⁷ MDTF resources were transferred to CCRIF via a recipient-executed trust fund CCRIF Grant Agreement.⁸ The trust fund resources were not used to make a direct investment in CCRIF, but rather to reimburse it over the course of project implementation for eligible expenditures described in paragraph 14. The initial total financing for the two components – US\$30,921,170.50 – was the sum of pledges from bilateral donors to the MDTF at the time that the IBTF was approved, less the Bank's 2 percent charge for administering the trust fund.⁹

1.6 Revised Components

N/A

⁷ TF070721.

⁸ CCRIF Grant No. TF058302; April 26, 2007.

⁹ Initial donor contributions in US\$ equivalents were: the United Kingdom Department for International Development (DFID) – US\$7,500,000.00; *Agence Française du Développement* (the French Agency for Development, AFD) – US\$6,350,750.00; and the Canadian International Development Agency (CIDA) – US\$17,701,464.80.

1.7 Other significant changes

17. Donor contributions to the MDTF eventually rose to some US\$67.4 million.

Table 2: Contributions to Multi-donor Trust Fund

Donor	Currency of Contribution	Amount of Contribution	Amount in US\$ Equivalent
Bermuda	US\$	500,000	500,000.00
CDB	US\$	5,000,000	5,000,000.00
Canada	CA\$	20,000,000	17,811,025.02
European Commission	Euro	12,500,000	16,960,000.00
French Republic	Euro	5,000,000	7,258,575.00
DFID	US\$	7,500,000	7,500,000.00
Ireland	US\$	2,400,000	2,400,000.00
IBRD	US\$	10,000,000	10,000,000.00
Total			67,429,600.02

18. With net interest income, the MDTF resources grew over time to US\$70,997,902.39. As these resources grew and as CCRIF's eligible expenditures increased, the CCRIF Grant Agreement was increased three times from the original US\$24 million, ultimately transferring to it the full amount of the MDTF. The PDO, outcome indicators, project components, and definition of eligible expenditures, however, remained as outlined in the original Grant Agreement.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

19. Grants from the Government of Japan under its Policy and Human Resource Development program (PHRD) to Jamaica and to Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and Saint Vincent and the Grenadines were vital to project preparation. The grants, which were administered by the World Bank, amounted to US\$800,000 and US\$1.0 million, respectively, and were implemented by the Jamaican Social Investment Fund (JSIF) and the OECS Secretariat, respectively. Project preparation was also supported by Bank budget, amounting to some US\$400,000. These funds were drawn from the preparation budgets for two closely related projects which funded the participation of Haiti, Dominica, Grenada, St. Lucia and St. Vincent and the Grenadines in CCRIF (see Annex 4(b)).

20. Project design, led by the World Bank with the collaboration of JSIF and the OECS Secretariat, was particularly challenging, as CCRIF was the first multi-country, multi-peril pooled catastrophe risk insurance facility in the world. In-depth World Bank analytical work provided the intellectual underpinnings for the initial dialogue with Caribbean and other stakeholders and for designing the structure and policies of the Facility. Key elements in this regard were a Bank-published book on the Caribbean case, “Managing Catastrophic Disaster Risks Using Alternative Risk Financing and Pooled Insurance Structures”, and a paper published jointly by the World Bank, United States Agency for International Development (USAID), and the Organization of American States (OAS) titled “Insurance, Reinsurance and Catastrophe Protection in the Caribbean”.¹⁰
21. Project design drew on data and knowledge accumulated in the Caribbean, North America, Europe, and Asia by catastrophe risk insurance entities; insurance regulators; actuaries; probabilistic catastrophe risk modeling companies; private sector insurance and reinsurance companies, brokers, and associations; disaster emergency management organizations; and meteorological, hydrological, and seismic monitoring and research centers such as the World Meteorological Organization (WMO), U.S. National Oceanographic and Atmospheric Agency (NOAA), National Hurricane Center (NHC), California Earthquake Authority (CEA), the Florida and Hawaii hurricane funds, U.S. Geological Survey (USGS), and SRC. In addition to the work undertaken to identify the most suitable hazard and loss estimation model (HLEM), map and assess risks, develop and price the policies, and flesh out the institutional and governance structure of the Facility, a thorough assessment was undertaken of the regulatory environment for captive insurance companies in various Caribbean jurisdictions, including their anti-money laundering and anti-terrorist finance regimes, leading to the choice to domicile CCRIF in the Cayman Islands.
22. Design required extremely sophisticated modeling of hurricane and earthquake risk in the Caribbean to develop the HLEM that would underpin the pricing of CCRIF’s policies and its financial sustainability. The modeling entailed a number of steps, including: (i) physical risk mapping and vulnerability estimation for the Caribbean islands; (ii) innovative actuarial analysis of the probability of tropical storm and earthquake events of different intensities and insurance pricing studies; (iii) evaluation of financial structures and instruments and their associated costs for

¹⁰ (i) “Managing Catastrophic Disaster Risks Using Alternative Risk Financing and Pooled Insurance Structures”; John D. Pollner; World Bank Technical Paper No. 495; The World Bank; May 2001. (ii) “Insurance, Reinsurance and Catastrophe Protection in the Caribbean – A Working Paper prepared in collaboration with the World Bank”; Arthur F. Evans, John Pollner, W. Ed Morris, and Jan C. Vermeiren; Organization of American States, General Secretariat, Unit for Sustainable Development and Environment; USAID-OAS Caribbean Disaster Mitigation Project; May 1996.

pooled risk financing and insurance; and (iv) assessment of options for the institutional and legal structure of the Facility.

23. The design of CCRIF was well tailored to help the Caribbean countries reduce their financial vulnerability to natural disasters by addressing the limitations on their capacity individually to absorb the initial financial impact of hurricanes and earthquakes.

- **Risk pooling** – CCRIF was designed to aggregate disaster risks across the Caribbean, achieving the kind of risk diversification and spreading that its members are not able to attain on their own.
- **Affordability** – Structuring CCRIF as a risk pool with a diversified portfolio enables it to offer insurance at affordable prices. At the time of appraisal, it was estimated that CCRIF insurance would cost 60 to 70 percent less than the members’ cost of self-insurance through establishment of a reserve fund, and 45 to 50 percent less than the cost of coverage if they were able to obtain it individually in traditional markets.
- **Parametric facility** – CCRIF was designed as a parametric insurer to pay claims based on the occurrence of a hurricane or earthquake of a pre-defined magnitude – expressed in terms of proximity, wind speed, storm surge and waves for hurricanes and ground shaking for earthquakes – as measured by data publically available from independent scientific agencies.¹¹
- **Timely and predictable payouts** – Given CCRIF’s nature as a parametric insurer, its payouts are both timely and predictable. CCRIF is able to make payouts within two weeks or less of a covered disaster. This is possible because, with covered events being defined in advance and subject to rapid measurement based on data from independent third parties, no *ex post* visit by an insurance adjuster is required to assess damage on the ground and determine the amount of the payout.

¹¹ Parametric insurance differs from the more traditional indemnity insurance in how losses are determined and payouts are made. Under traditional indemnity insurance, losses are determined based on an adjuster’s *ex post*, on-the-ground assessment of actual damage. This can be a time-consuming and contentious process and payouts to the insured are made only after it is completed. With parametric insurance, payouts are triggered by the occurrence of natural disasters of a magnitude previously defined in the policy in terms of proximity, wind speed, storm surge and waves for hurricanes and ground shaking for earthquakes. Payouts under parametric policies are based on an estimate of the losses associated with those parameters as calculated by the HLEM. Because payouts are calculated by the model, no on-the-ground *ex-post* loss assessment is required and, accordingly they come quickly. In the case of parametric insurance, there can be significant basis risk, i.e., the risk that a payout will be made when there is little actual damage or the risk that the payout will be significantly less than the amount of damage against which the policy holder obtained insurance. In the case of CCRIF, however, basis risk was mitigated through the sophisticated modeling process described in paragraph 22. CCRIF members can obtain coverage for hurricanes as frequent as a 1 in 15 year event and for earthquakes as frequent as a 1 in 20 year event. The maximum coverage available for each peril for each year for which coverage is purchased is US\$100 million. The Facility uses publically available and readily verified scientific data from NHC for hurricanes and USGS for earthquakes.

- **Immediate liquidity** – By making rapid payouts, CCRIF meets its members’ requirements for an immediate injection of liquidity following a disaster to help them maintain essential government functions and jump-start recovery.
- **Flexible resources** – CCRIF’s policies were designed to provide payouts sufficient to help members finance their initial disaster response and maintain basic government functions while they mobilize the much larger amount of resources necessary to fund the longer-term recovery effort. CCRIF was not designed as a vehicle for funding all or even a major part of the cost of the recovery effort, as financial risk transfer of such a magnitude would not be affordable. CCRIF payouts are not tied to specific, previously identified expenditures. Instead, member governments enjoy full flexibility in allocating the payouts to the priorities that they themselves identify.
- **Transparent payouts** – Because covered events are defined in advance in accordance with objectively measurable parameters and because the events themselves are measured by independent scientific agencies which make the data publically available, payouts are not only rapid, but also transparent and subject to third-party verification.¹²
- **Individualized coverage** – CCRIF was designed to allow members to tailor their policies to their own risk profile and fiscal requirements. They do this by adjusting three policy variables: (i) the attachment point (deductible or most statistically frequent event covered); (ii) exhaustion point (most statistically infrequent, or maximum, covered event); and (iii) ceding percentage (share of the loss between the attachment and exhaustion points that is insured). The cost of coverage is a direct function of the amount of risk that the member chooses to transfer; thus, there is no cross subsidization from members transferring a low amount of risk to those transferring a high amount.

24. A number of other design features contributed to the affordability of CCRIF insurance and the viability of its business model. Important among these were:

- **Donor support** – CCRIF was designed to be funded during its start-up phase in part by donor contributions. As described above, these eventually totaled some \$67.4 million; net interest income brought the final amount of the MDTF to about \$71.0 million.
- **Faster capital growth** – By defraying CCRIF’s major operating expenditures and reimbursing it for claims within its risk retention during its start-up phase, the MDTF enabled CCRIF to retain the bulk of its premium income and, thus, helped it to build its risk bearing capacity more quickly than it could have without such support and assure its financial sustainability as an independent entity over the long-term. One measure of this effect is that total donor resources transferred to

¹² CCRIF retains a Big Four audit firm for this purpose.

CCRIF were equal to 62.3 percent of its assets as of May 31, 2011.¹³ Annex 3 discusses in greater detail the impact of donor support.

- **Reinsurance** – CCRIF was designed to transfer part of its risk to reinsurers and to the capital market through a swap. This reduced the cost of the capital that CCRIF needed to cover its risk.
- **“Virtual” organizational structure** – CCRIF was structured as a not-for-profit virtual organization, with a part-time Board of Directors and no physical office or staff of its own. Professional services are all provided by contractors operating out of their own facilities: the Facility Supervisor, Insurance Manager, Communications Consultant, Investment Managers, Reinsurance Broker, and R&D support. By staying organizationally lean, CCRIF has been able to control its fixed costs and overhead.
- **Lower costs to members** – These design features helped to lower members’ costs. As CCRIF’s capital has grown, it has been able to reduce the participation fee requirement from 100 percent of premium to 50 percent for members of three or more years standing, lower the price of its coverage by about 30 percent, and begin to provide a 25 percent premium discount in years following years of no claims.

25. A central point to be reiterated is that CCRIF was established to add to its members’ revenues in the short-term by providing a cash infusion to help them fund the initial phase of their disaster response and avoid interruption of their basic business of government. CCRIF was never conceived of, nor designed as, an instrument for avoiding longer-term impacts of the disaster on the government’s debt and balance sheet. As already indicated, attempting to insure the entire costs of the covered disasters would be prohibitively expensive. Nor was CCRIF conceived or designed to be a complete and comprehensive disaster response strategy for its members. Instead, CCRIF was explicitly seen as only one instrument in the tool chest for a comprehensive disaster risk management strategy. A comprehensive strategy would include not just financial risk transfer, but also: (i) accumulation and analysis of information about hazards and potential losses; (ii) disaster preparedness measures, such as prepositioning relief supplies in critical areas; (iii) establishment of monitoring networks and warning systems for hydrometeorological and seismic events; (iv) identification of evacuation routes; (v) development and implementation of zoning and building codes to reduce settlement in hazard prone areas and to increase the disaster resilience of construction, including in the private sector; and (vi) public investments such as drainage networks and sea walls.

26. During the design and project preparation process, extensive stakeholder consultations were undertaken to help shape the Facility’s objectives, structures, and products and build support for a successful launch. These included a number of

¹³ Or equal to 60.2 percent of CCRIF’s assets as of May 31, 2012, based on CCRIF’s unaudited financial statements for 2011-2012.

consultations, workshops, conferences, and briefings for CARICOM Heads of Government, Finance Ministers and Permanent Secretaries, insurance supervisors and regulators, and other senior government officials; the CARICOM Secretariat and CARICOM organizations such as CDEMA and CIMH; U.N. bodies; technical specialists; donors; research institutes; and private sector entities involved in probabilistic hazard modeling and catastrophe insurance and reinsurance. Among the major consultations and outreach activities were: (i) a regional introductory workshop in Kingston, Jamaica, organized in collaboration with JSIF and the CARICOM Council for Finance and Planning (COFAP) in April 2006; (ii) briefings for the CARICOM Heads of Governments in July and October 2006, the latter organized in collaboration with the Caribbean Development Bank (CDB); and (iii) a donors conference in February 2007, which was opened by then World Bank President Paul Wolfowitz, Keith Mitchell, then Prime Minister of Grenada, and Omar Davies, then Minister of Finance and Planning for Jamaica. Detailed reports on the work to design the Facility were provided at the latter two events. A briefing was also provided to the Small Island Developing States (SIDs) under the auspices of the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States, given the interest of the latter in CCRIF as a possible model for similar facilities in other regions of the world, such as the South Pacific.

2.2 Implementation

27. Implementation proceeded smoothly under the leadership of CCRIF's Board of Directors and with the capable technical and administrative support of the Facility Supervisor, Insurance Manager, Communications Consultant, Investment Managers, and Reinsurance Brokers. The project was never at risk and no restructuring was ever contemplated or required other than to put into effect the expected increases in the amount of the Grant. Disbursements were consistently ahead of projections and were completed before the closing date of the Grant. CCRIF's quarterly reports to the Bank were timely and met the requirements of the Grant Agreement. External audits of CCRIF's financial statements were also timely, as well as unqualified. The auditor's management letters never expressed material concerns about CCRIF's internal controls. An on-site inspection of CCRIF in 2011 by its regulator, the Cayman Islands Monetary Authority (CIMA), found it to be fully in compliance with the relevant regulatory regime and CCRIF's Trust Deed. In implementing the project, CCRIF gave careful consideration to the recommendations that the Bank made in three in-depth assessments of CCRIF's operations and took steps to strengthen its operations in line with those recommendations.¹⁴ (See Section 5(b), *Quality of Supervision*, for examples.)

¹⁴ The three reports were: (i) "A Review of CCRIF's Operation After Its First Season"; World Bank, December 1, 2008; (ii) "A Review of CCRIF's Operation After Its Second Season"; World Bank, April 2010; and (iii) "Reducing Financial Vulnerability to Natural Disasters in the Caribbean: A Review of CCRIF's Operation After Its Third Season"; World Bank, April 2011.

28. CCRIF rapidly built its capital and risk bearing capacity. As of May 31, 2011, the end of CCRIF's fourth year of operations – the latest year for which externally audited financial statements are currently available – it had retained earnings of US\$89.8 million and total assets somewhat in excess of US\$114.0 million.¹⁵ Disbursements from the MDTF amounting to nearly US\$71 million made a major contribution, as intended, to the growth of CCRIF's risk bearing capacity by reimbursing it for major operational and risk transfer costs and policy payouts within its risk retention. Annex 3 discusses the contribution of donor support to CCRIF's survivability in greater detail. The fortunate occurrence of total policy payouts below CCRIF's modeled average annual loss (AAL) in its first three years of operation also contributed. In its fifth financial year, from June 1, 2011, to May 31, 2012, CCRIF made no payouts at all, thanks in part to the mild 2011 Atlantic hurricane season.

**Table 3: Caribbean Catastrophe Risk Insurance Facility
Payouts as of June 26, 2012**

Event	Date	Member Affected	Payout (US\$)
Earthquake	November 29, 2007	Dominica	528,021
Earthquake	November 29, 2007	St. Lucia	418,976
Tropical Cyclone Ike	September 2008	Turks and Caicos Islands	6,303,913
Earthquake	January 12, 2010	Haiti	7,753,579
Tropical Cyclone Earl	August 2010	Anguilla	4,282,733
Tropical Cyclone Tomas	October 2010	Barbados	8,560,247
Tropical Cyclone Tomas	October 2010	St. Lucia	3,241,613
Tropical Cyclone Tomas	October 2010	St. Vincent and the Grenadines	1,090,388
Total Payouts			US\$32,179,470

29. For the fifth consecutive year, June 1, 2011, to May 31, 2012, all members again renewed their policies. CCRIF wrote 16 hurricane and 13 earthquake policies with a total coverage limit of US\$624.4 million. It obtained reinsurance to cover US\$125 million of this risk. The bulk of this risk transfer – US\$95 million – occurred through competitive contracts to cede reinsurance to global reinsurance companies. The balance was initially taken up by the Bank's Treasury, which then swapped it to reinsurers via the capital market. This reinsurance gave CCRIF the capacity to pay claims associated with a series of catastrophes of such large magnitude that they are expected to occur only once in every 1,401 years without needing to draw on its own

¹⁵ CCRIF's financial statements, as yet unaudited, for its financial year ending May 31, 2012, show retained earnings of US\$94.6 million and total assets of US\$118.4 million.

capital for more than US\$25 million (its retained risk for 2011-2012). With CCRIF's assets over and above US\$25 million, it had the capacity to withstand an even more severe series of events with a modeled probability of occurring only once in every 10,000 years, although it would require recapitalization in order to continue operating thereafter.¹⁶

30. The Facility has consistently been conscious of the importance of providing financial value to its members, particularly in light of their fiscal constraints – limited revenue bases and high levels of indebtedness. Accordingly, as CCRIF's financial strength has grown, it has taken steps to make its coverage more affordable. Since its first year of operations, CCRIF has lowered its pricing three times for a total reduction of about 30 percent. Members have taken advantage of these reductions to increase their coverage steadily. As a result, CCRIF's aggregate policy limits increased by 26.2 percent from US\$494.8 million in its first year of operations to a total of US\$624.4 million for 2011-2012.¹⁷ In addition, CCRIF reduced the minimum participation fee requirement for members of three years standing from 100 percent of premium to 50 percent. This enabled members to draw on their deposits to defray part of the cost of their premiums for the fourth year. Finally, given the continued growth of CCRIF's capital strength, it took the decision that, beginning with the year commencing on June 1, 2012, it would provide members a premium discount for any year following a year in which it had made no payouts. The discount is equal to 25 percent of the respective member's premium in the year in which no claims were paid. No claims having been paid in 2011-2012, CCRIF members were able to benefit from this discount on their 2012-2013 coverage.
31. CCRIF has shown flexibility in responding to other needs of its members. In October 2010, following Hurricane Tomas, CCRIF responded to the urgent appeal of the affected countries – Barbados, St. Lucia, and St. Vincent and the Grenadines – for immediate support. Moving more quickly than required by the terms of their policies, CCRIF advanced to them 50 percent of their expected payouts within a matter of days, providing the balance within the normal period of two weeks after the event.
32. CCRIF is also expanding its product line. Working with risk modelers, CIMH, members' authorities, and reinsurers, it has overcome a number of data and methodological difficulties and is in the final stages of developing a policy to insure against excess rainfall. It expects to begin offering coverage for this additional peril early in its 2012-2013 financial year. This is of great interest to a number of CCRIF members, with Jamaica and Haiti expected to be among the first to take up the product. In addition, the product is thought likely to attract new members – possibly

¹⁶ For its sixth year – June 1, 2012, to May 31, 2013 – CCRIF wrote policies totaling US\$626.2 million, with all 16 members renewing. It maintained its risk retention at US\$25 million and obtained reinsurance amounting to US\$120 million, including a US\$30 million swap intermediated by the World Bank Treasury. The top of CCRIF's US\$145 million of combined risk retention and reinsurance is estimated to give it the capacity to pay claims arising from a 1 in 1,125 year event.

¹⁷ US\$626.2 million for 2012-2013.

Guyana, Suriname, the British Virgin Islands, and/or Montserrat – an expansion that would benefit all members by further diversifying CCRIF’s risk pool.

33. The Facility has sought to increase its value to its members in non-financial ways. In 2009, it initiated a technical assistance (TA) program, which is funded by a portion of its investment income and aimed at strengthening its members’ awareness and understanding of their disaster vulnerability and disaster risk management capacity.¹⁸ The program consists of three components: (i) a scholarship and professional development program for students and officials from CARICOM countries studying or working in areas of environment, sustainable development, meteorology, and insurance; (ii) regional strategic knowledge building activities; and (iii) support for local DRM initiatives. The latter is not yet under way but is to be developed in collaboration with other development partners in the region so as to avoid duplication of effort and inefficient use of resources.
34. Most recently, in June 2012, CCRIF awarded two scholarships following a competitive application process. Both for two-year programs, the first was for a Masters in Public Administration in Environmental Science and Policy from Columbia University and the other for a Masters of Science in Climate Change and Development from Sussex University. Previously, in collaboration with UWI and through a competitive application process, CCRIF awarded three scholarships for undergraduate and three for post-graduate studies at institutions forming part of the UWI system in areas related to DRM such as civil and environmental engineering, geography and geology, and disaster management. CCRIF also granted a scholarship to a national of one of its members to pursue a Masters of Science degree in Atmosphere, Ocean and Climate at Reading University.
35. CCRIF has sponsored various conferences, professional development workshops and seminars, sometimes providing funding to facilitate the participation of CCRIF member officials. One recent example of this is CCRIF’s sponsorship for the Sixth Caribbean Conference on Comprehensive Disaster Management (CDM) held in Trinidad in December 2011 under the auspices of CDEMA. This sponsorship was provided within the framework of the MOU between CCRIF and CDEMA. CCRIF’s sponsorship provided support for the inaugural High-Level Session, a plenary session, and two professional development sessions on the Global Earthquake Model, conducted by UWI/SRC, and Flood Early Warning Systems, conducted by the Japan International Cooperation Agency. This sponsorship followed similar support for CDEMA CDM conferences in the previous two years. CCRIF also provided sponsorship for the sixth conference of the Caribbean Division of the Institution of Structural Engineers in October 2011, also in Port-of-Spain, the theme of which was “Environmentally Sustainable Construction – Mitigation and Adaptation to Climate Change.” CCRIF itself hosted the annual meeting of the World Forum of Catastrophe

¹⁸ TA spending is capped at 50 percent of the previous year’s investment income. The amount budgeted and spent, however, is based on a disciplined process of Board review and approval of specific programs and activities. To date, annual TA budgets have not risen to the level of the cap.

Programmes in Jamaica in October 2011, the Forum being a mechanism for sharing information and experiences among public sector-supported catastrophe risk insurance systems. Other recent examples of CCRIF's professional development and knowledge sharing activities include workshops to improve understanding of the forthcoming excess rainfall product, held in collaboration with CIMH, and to train Caribbean disaster risk management and meteorological officials in use of Real Time Forecasting System (RTFS), which CCRIF licenses from Kinetic Analysis Corporation (KAC) and provides free of cost to its members.¹⁹

36. One important knowledge generation effort that CCRIF funded was the Economics of Climate Adaptation (ECA) Initiative, which it carried out in collaboration with CCCCC and UN-ECLAC with analytical support from Swiss Re and McKinsey & Company. Using the ECA methodology,²⁰ the study conducted a cost-benefit analysis of a range of adaptation measures to reduce damage to physical assets, behavioral measures such as enforcement of zoning and building codes, and financial risk transfer options in eight pilot countries.²¹ This analysis was aimed at providing the facts and tools to develop cost effective strategies that could be incorporated into national adaptation programs of action and helped the countries prepare for their participation in COP-16.
37. Seeking to anchor itself firmly within the broader framework of disaster risk management strategies and programs in the Caribbean, CCRIF has built a number of partnerships with other Caribbean institutions. As already noted in Section 1.4, Beneficiaries, CCRIF has signed MOUs with CIMH, CDEMA, CCCCC, UN-ECLAC, SRC, and the OECS Secretariat. The MOUs provide the framework for collaboration through information exchange and support for specific activities, which are intended to improve the understanding of disaster risk and the quantity and quality of related data, not only to support CCRIF's work and that of its partner, but also to benefit CCRIF members and the region more broadly. For example, the MOU with CIMH calls for collaboration in the areas of research into catastrophe risk and development of new products, specifically the excess rainfall product, provision of real-time information to Caribbean countries and institutions such as CDEMA on tropical cyclones, and training for officials in the region in hydrology and meteorology.

¹⁹ The Arbiter of Storms-Real Time Forecasting System (its full name) was developed by KAC to facilitate better prediction of and response to storms and their likely effects. Users can obtain maps and tabular estimates, updated at regular, frequent intervals, of factors such as maximum hazard intensity for wind speed, wave and storm surge height, and cumulative rainfall. They can also obtain estimates of the impact of varying hazard levels on their territory and the storm's operational impact on major sea and airports, as well as other site-specific hazard and impact maps. Such information is particularly useful to members' emergency management agencies and air and sea port authorities, for example in making timely decisions regarding relocation of equipment, evacuation of people, temporary shelter, and deployment of disaster recovery staff and materiel.

²⁰ A methodology developed by the ECA Working Group, a consortium of public and private sector institutions including the Global Environmental Facility (GEF), United Nations Environment Programme (UNEP), Swiss Re, the Rockefeller Foundation, Climate Works, Standard Chartered, McKinsey & Company, and the EU.

²¹ Anguilla, Cayman Islands, Antigua and Barbuda, Dominica, Barbados, Jamaica, Bermuda and St. Lucia.

CCRIF provides funding for these activities and associated equipment and CIMH, in kind support in personnel and facilities.

38. The support provided by CCRIF and CIMH to relief and reconstruction efforts in Haiti following the January 10, 2010, earthquake is a concrete example of the benefits of such collaboration. CIMH developed publicly available, fully automated rainfall and flood prediction and inundation risk products for three watersheds identified as critical by CCRIF and, in collaboration with CCRIF, assisted the Haitian authorities, international donors, and others in their use to inform urgent decisions on matters such as the location of temporary shelters and tent camps for displaced persons, key relief and recovery operational centers, and transportation hubs. These products continue to be used in decision making regarding reconstruction of critical infrastructure. In another example, under the MOU between CCRIF and SRC, CCRIF is helping to fund installation of a new accelerometric network consisting of twelve strong-motion sensors in Jamaica and across the Eastern Caribbean. Data produced by this network is expected to strengthen disaster preparedness and will be used to refine CCRIF's model. CCRIF is developing specific work plans with its other partners.
39. CCRIF also offers technical assistance to members that have been affected by a disaster that caused damage but not enough to trigger their policy. One case of this is financing for academic studies in meteorology for personnel to strengthen capacity at the NMHS of Belize.
40. CCRIF has steadily expanded its outreach to other stakeholders such as donors and the general public, through direct contacts, use of print, radio, and television media, participation in conferences, and development of its own website. News bulletins, press releases, and quarterly and annual reports are issued and made available on CCRIF's website, along with a variety of technical publications on specialized topics including CCRIF's product range, characteristics of parametric insurance, the RTFS, and the economics of climate change. Publications and other information on CCRIF's website document the rapid increase in use of its website, the number of outreach and partnership activities, and the volume of press coverage. These communications activities have helped to enhance understanding of CCRIF's role in disaster risk management and contributed to the consolidation of its standing as a Caribbean institution.
41. Finally, CCRIF worked consistently to strengthen its governance and continues to do so. Key actions in this regard include:
 - The Board set a Strategic Plan for 2009-2012, including vision and mission statements, objectives, and specific performance targets for operational efficiency, internal controls, new product development, pricing and financial stability, and stakeholder communications. It up-dated the plan annually and, in February 2012, adopted a new Strategic Plan for 2012-2015, again with specific objectives, and action plan, and performance targets. To enhance transparency, both Strategic

- Plans were published on CCRIF's website. Quarterly reports prepared by the Communications Consultant align the presentation of CCRIF's activities and accomplishments with the specific objectives in the Strategic Plan in order to focus on results. Announcements of key Board decisions also enhance CCRIF's transparency.
- The Board also instituted a number of procedures to strengthen budget formulation, implementation, and monitoring and to improve records of the Board's proceedings and ensure appropriate follow-up to its decisions.
 - Annual reviews of the Operations Manual were conducted, with up-dates, as necessary, in areas such as: (i) policy with respect to frequency of retendering contracts for service providers and their scope of work; (ii) rules of Board procedure, including the nomination, compensation, and term of Directors; (iii) internal controls, including arrangements for authorizing payments for goods and services; (iv) terms of reference of the service providers; and (v) ethics rules.
 - A transition in composition of the Board was completed such that four Directors have now been appointed, two by the CDB on behalf of the donors and two by CARICOM on behalf of the members, in accordance with the procedures established in CCRIF's Trust Deed.²²
 - The Board developed and has begun to implement a plan to mitigate the risk of business interruption and loss of institutional memory by better balancing the terms of reference of the service providers, creating a full-time chief executive officer position, adjusting the scope of work of the Executive Chairman of the Board and the Facility Supervisor accordingly, and staggering the terms of the Directors.
 - At its June 2012 meeting, the Board reviewed CCRIF's governance structure in light of recommendations made by the International Association of Insurance Supervisors in January 2012 on the regulation and supervision of captive insurance companies. CIMA intends to implement the recommendations once finalized. Based on this review, the Board decided to strengthen its structure and processes. Enhancements include the formal establishment of a Board Sub-Committee for Internal Audit and Risk Management and formalization and expansion of the terms of reference for the Reinsurance and Investment Sub-Committees to ensure that risk management is adequately addressed.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

42. The IBTF set forth the following key performance indicators: "Establishment of the Facility by end March 2007, and natural catastrophe risk coverage provided to participant countries for the Hurricane Seasons 2007, 2008, 2009, and 2010." The kind of more elaborate formal results monitoring and evaluation framework that is annexed to a PAD was not prepared because, as indicated in paragraph 6, the Bank

²² Under the terms of the Trust Deed, the four Directors can then appoint an Executive Director.

policy for trust-funded operations which was in effect at the time the project was prepared and approved did not require one.

43. During project implementation, a results framework was developed for supervision purposes. The first ISR, dated June 2008, specified the following:
- PDO level indicator: “Countries are eligible for insurance payment (and have received payment in case of an insured event).”
 - Baseline: “CCRIF not yet established”
 - End-of-Project Target Value: “Participation fee paid and insurance policy purchased”
 - Intermediate outcome indicator – “Total claims paying capacity of CCRIF”
 - Baseline: “0”
 - End-of-Project Target Value: “US\$110 million”

These indicators were tracked and data were used to inform decisions with respect to policy pricing, reinsurance, and formulation, implementation, and monitoring of the Strategic Plan.

44. A survey of beneficiaries was conducted in June 2011 to assess their awareness of CCRIF, understanding of its products and services, and contributions to disaster risk management in the Caribbean (See Section 3.6). CCRIF drew on the findings of this evaluation in crafting its new Strategic Plan 2012-2015.

2.4 Safeguard and Fiduciary Compliance

45. The project did not trigger any environmental or social safeguards.
46. Fiduciary performance was without shortcomings. Procurement and financial management were handled in accordance with the conditions of the Grant Agreement. As indicated in Section 2.2, *Implementation*, external audits of CCRIF’s financial statements were timely and unqualified and the auditor’s management letters never expressed material concerns about CCRIF’s internal controls. CCRIF’s quarterly reports to the Bank met the requirements of the Grant Agreement and were timely. An on-site inspection of CCRIF in 2011 by its regulator, CIMA, found it to be fully in compliance with the relevant regulatory regime and CCRIF’s Trust Deed.

2.5 Post-completion Operation/Next Phase

47. Donor support provided through the MDTF achieved its major objective of establishing CCRIF as a fully functioning independent legal entity capable of sustaining itself based on premium income from its members, coupled with income from its investments (see Annex 3 for a further discussion of the contribution of donor support to CCRIF’s financial sustainability). CCRIF’s pricing policy is explicitly designed to balance the interests of its members in affordable insurance with the need to defray its key operational expenses and maintain the financial

strength required to continue providing valuable insurance and other services to its members. For 2011-2012, it had robust risk bearing capacity sufficient, as indicated in Section 2.2, to withstand a series of disasters with a modeled probability of occurring only once in every 1401 years without needing to draw on more than US\$25 million of its US\$114 million of assets. CCRIF's assets over and above US\$25 million would serve to pay claims associated with a 1 in 10,000 year event, although it would require recapitalization thereafter to continue operations.

48. CCRIF's next important institutional step is to launch the excess rainfall product. Planned for early in its 2012-2013 financial year, the availability of this product is expected to lead, as indicated in paragraph 32, to some expansion of CCRIF's membership.
49. In addition, CCRIF is working with the Munich Climate Insurance Initiative (MCII) to develop parametric micro and portfolio insurance products of two sorts, which are expected to be piloted in three CCRIF countries: Grenada, Jamaica, and St. Lucia. The first would be a livelihood protection product for small scale producers and businesses – such as farmers and tourism operators – that would provide payouts following weather-related natural disasters of pre-determined magnitudes in order to offset a portion of their income and other economic losses from the disasters. This product would be underwritten by locally licensed insurance companies and distributed through institutions such as cooperatives, credit unions, micro-finance agencies with community reach. CCRIF is exploring the possibility of acting as a reinsurer to the issuing institutions. The second would be a product for institutions such as credit unions and development banks that have significant portfolios of loans to individuals and micro, small, and medium-sized enterprises. The product would provide coverage to the credit institutions against the risk of losses in its portfolio due to defaults arising from the impact of weather-related events on the borrowers' debt service capacity. With regulatory approval, CCRIF could write the product directly.
50. CCRIF will continue its partnerships with other Caribbean institutions, bilateral donors, and the World Bank with a view to helping to strengthen disaster risk management in the Caribbean. Discussions with the European Union delegation in Bridgetown, Barbados, are currently under way regarding possible specific areas of development cooperation.
51. Finally, CCRIF has provided some initial support to the Caribbean Electrical Utility Service Corporation (CARILEC) in exploring technical, financial, and institutional options for parametric insurance for its member utilities. Depending on interest from CARILEC, it plans to continue this collaboration.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

Rating: High

52. The project remains highly relevant to the challenges facing in the countries in the Caribbean, their development priorities, and the World Bank's strategies for partnering with them. Natural disasters, which can cause damage equal to a significant share if not even a multiple of GDP and which disproportionately affect the poor, are no less a concern to the countries in the region now than they were at the time of project appraisal. Indeed, concerns are mounting that weather-related disasters may be increasing in their frequency and severity, while the risk of seismic disasters is, of course, ever present. Thus, financial risk transfer through insurance or participation in a joint reserve mechanism such as CCRIF that can pay out rapidly continues to be an essential element of a broader natural disaster risk management strategy.
53. The capacity of most of the Caribbean countries individually to absorb the financial impact of natural disasters remains severely limited by geographical factors, their modest fiscal revenues, and high debt levels. Some amount of donor assistance is usually available to them in the wake of a catastrophe, but often comes with a delay. This inhibits the governments' efforts to jump start relief efforts and begin mobilizing the much larger amount of resources needed for full recovery. Thus, while much of the focus in the countries' development plans and in the World Bank's country partnership strategies is on engineering solutions and social interventions to make infrastructure, housing, businesses, and people's livelihoods more resilient to natural disasters, financial risk transfer, including through parametric instruments, also continues to figure as a necessary tool in the countries' broader overall strategies for effective disaster risk management. The World Bank is currently elaborating a programmatic engagement on disaster risk management and climate resilience in the Caribbean region, elements of which will include the expansion of opportunities for financial risk transfer, as well as engineering and behavioral adaptation solutions. CCRIF's on-going interest in broadening the ECA Initiative, described in paragraph 36, is another aspect of the project's continuing relevance.
54. The project is also highly relevant to the Bank's broader corporate objective of diversifying Bank instruments and developing structures to smooth shocks. Catastrophe insurance is one such instrument and facilities based on the same principles as CCRIF are being developed in the Pacific, Mexico, and elsewhere.

3.2 Achievement of Project Development Objectives

Rating: High

55. The PDO of the trust fund was to support the establishment and operation of CCRIF in order to reduce the Caribbean countries' financial vulnerability to earthquakes and hurricanes. This objective and the associated PDO and intermediate outcome indicators as set forth in the ISRs (see Section 2.3 above) were fully achieved.
56. The trust fund successfully supported CCRIF's establishment and operations by reimbursing it for major operational expenses, reinsurance costs, and claims paid within its risk retention during its first four years. MDTF support enabled CCRIF to retain more of its premium income than would otherwise have been possible, thus accelerating its trajectory towards becoming a financially sustainable, self-standing insurance provider. For 2011-2012, CCRIF had the capacity to pay \$150 million in claims, associated with a series of catastrophes of such large magnitude that they are expected to occur only once in every 1,401 years, without needing to draw more than US\$25 million (its retained risk) from its own capital of \$114 million. With CCRIF's assets over and above US\$25 million, it could withstand an even more severe series of events with a modeled probability of occurring only once in every 10,000 years.
57. By both of these measures (dollar amounts and frequency of disaster), CCRIF's claims paying capacity by far exceeds expectations. The target for CCRIF's end-of-project claims paying capacity was set in the ISRs at US\$110 million, versus the US\$150 million achieved for 2011-2012, while the expectation in terms of return period was one in 200 years, versus the one in 1,401 years achieved with reinsurance and US\$25 million of CCRIF's own resources.²³ The latter compares favorably with the claims paying capacity of the CEA, which is estimated at one in 850 years.
58. As expressed in the PDO, the purpose of establishing CCRIF was to reduce Caribbean countries' financial vulnerability to earthquakes and hurricanes. This objective has been achieved. By its very nature, the purchase of insurance reduces financial vulnerability. The 16 Caribbean countries and territories that joined CCRIF in 2007 purchased 29 policies, which they have since renewed annually. Coverage that they have obtained from these policies rose by 26.2 percent from an aggregate of US\$494.8 million in 2007-2008 to US\$624.4 million in 2011-2012.²⁴ These policies have provided them with a hedge against the financial risk associated with earthquakes and hurricanes and the certainty of timely support in the event of a disaster of sufficient magnitude to trigger the policy.
59. The seven CCRIF members that have been affected by covered disasters received the additional financial benefit of a rapid infusion of liquidity into their general budgets

²³ Memorandum to the Executive Directors – Proposed Transfer of IBRD Surplus to Support a Caribbean Catastrophe Risk Insurance Facility; February 9, 2007; page 10.

²⁴ US\$626.2 million for 2012-2013.

at a crucial time of particular need. Such budget support has totaled US\$32.2 million to date. The use of these cash transfers, which came within two weeks or less of the disaster, was in no way earmarked or restricted. This allowed the recipient countries to mount their initial high priority relief and recovery efforts more quickly and extensively than would have been possible without the payouts and without needing immediately to incur additional short-term government debt. Being able to move quickly enabled the governments to prevent or at least restrain the further deterioration of damaged infrastructure and added human suffering, thus helping them to improve the quality and scope of their initial response while they went about mobilizing the much larger amount of financing needed for the broader recovery and reconstruction.²⁵

60. Members who have received payouts report having allocated them for purposes such as:

- temporary feeding stations for displaced and other affected persons (Turks and Caicos Islands);
- immediate reconstruction and stabilization of government processes and provision of civilian security (Haiti);²⁶
- capital expenditures, e.g., clearing silty rivers, unblocking major roads, stabilizing drinking water plants, and repair of a key government building (St. Lucia);
- recovery efforts under direction of the environmental management agency and emergency repairs of key infrastructure, including a major road along the port (Barbados);
- clearing of debris, repairing general damage, capitalizing a special recovery fund and purchasing upgraded weather monitoring data-capture technology and portable weather systems to improve early warning (Anguilla); and
- acquiring building and other materials for persons whose homes or crops had been damaged (St. Vincent and the Grenadines).

61. Statements by senior Caribbean officials following Hurricane Tomas and the January 10, 2010, earthquake that struck Haiti serve to illustrate important views of the high level of CCRIF's relevance and efficacy:²⁷

²⁵ To improve capacity to absorb cash transfers such as CCRIF payouts and use them effectively for activities benefiting affected persons, the Bank has been working with a number of countries in the Caribbean to strengthen the legal framework and processes for emergency budget appropriation and execution.

²⁶ The US\$7.75 million payment represented approximately 20 times Haiti's earthquake premium. Among the approximately 130 articles from regional, international, insurance, and other press outlets, the following from an article on the Center for Global Development website, which was quoted in the CCRIF Quarterly Report for 1 December, 2009 – 28 February, 2010, page 18: "The sum is small, but the proof of concept, powerful. The CCRIF moved faster than the World Bank, faster than the IMF, faster than the U.S. government. If another 0 or so were appended to the CCRIF financing numbers, it could become a superior alternative to *ad hoc* debt relief and debt creation at dire moments."

²⁷ Barbados and Anguilla citations taken from CCRIF's Quarterly Report for 1 June – 31 August 2011, pages 10 and 12; Jamaica citation, Quarterly Report for 1 December 2010 – 28 February, 2011, pages 9 and

- Barbados Minister of Finance and Economic Affairs, Chris Sinkler, in his Financial Statement and Budgetary Proposals for 2011 delivered to Parliament in August 2011, indicated that fiscal revenues for 2010-2011 had decreased but that “the full impact of this reduction was however not felt due to the receipt of the insurance payout from the Caribbean Catastrophe Risk Insurance Facility (CCRIF) for the damage caused by Tomas during the month of November 2010.”
- The Government of Anguilla’s website indicates that Acting Permanent Secretary in the Ministry of Infrastructure of Anguilla, Mr. Bancroft Battick, stated that Anguilla’s membership in CCRIF has brought significant benefits to the island, the major one being to make the Government of Anguilla as robust as possible to natural . . . disasters, with enhanced ability to respond after a major disaster event.”
- At the fifth Caribbean Conference on Disaster Management in Jamaica in December 2010, the Jamaica Information Service reported that then-Prime Minister Bruce Golding described CCRIF as “one of the most significant developments to have taken place in recent years in the region” and went on to say “I am really pleased with the speed with which CCRIF has been able to respond to those cases – Haiti, Anguilla, and the Eastern Caribbean countries – that were battered by Tomas.”
- Speaking after Hurricane Tomas and expressing appreciation for the advance of the CCRIF payout, Prime Minister Ralph Gonsalves of St. Vincent and the Grenadines said the early payment would facilitate “urgent restoration of services and clearing of the affected areas.”
- At the COFAP 2010 meeting, then CARICOM Secretary-General Edwin Carrington stated, “[CARICOM’s] wisdom and foresight were evident in the creation of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) whose prompt pay-out to Haiti turned out to be one of the significant sources of financing in this, Haiti’s hour of need.”

3.3 Efficiency

Rating: High

62. CCRIF is a highly efficient vehicle through which members can reduce their financial vulnerability to natural catastrophes. At the time of appraisal, it was estimated that CCRIF insurance would cost 60 to 70 percent less than the members’ cost of self-insurance and 45 to 50 percent less than the cost of insurance that they would be able to get individually in traditional markets. A reassessment for this ICR based on current market conditions reconfirms that participation in CCRIF is a highly efficient way for its members to reduce their financial vulnerability to natural catastrophes. The paragraphs below describe the methodology and results of the reassessment.

14; St. Vincent and the Grenadines citation, Quarterly Report for 1 September 2010 – 30 November 2010, page 1; Haiti citation, Quarterly Report for 1 December, 2009 – 28 February, 2010, page 13.

63. Before entering into this reassessment, it should also be noted that, as an institution, CCRIF is highly efficient. One measure of its efficiency is its annual operating expenditures. CCRIF has kept these at 5 percent or less of its annual premium income. Another measure may be found in the fact that only 3.6 percent of Grant resources went to cover operational costs, including Board expenses and fees for professional services.

Methodology of reassessment

64. The financial benefits of participation in CCRIF can be assessed through a comparison of the long-term average price of coverage for CARICOM governments through CCRIF with: (i) the case where the country would have to go individually to the reinsurance market to buy the same coverage; and (ii) the case where the country would self-retain the same amount of catastrophe risks because insurance would not be available on the market. These results can be compared to those estimated at the time of appraisal of the CCRIF project.

65. The individual country costs of transfer of the same risk directly to the international market are estimated by using the reinsurance pricing algorithm that is used to estimate CCRIF's reinsurance costs. This then assumes that individual countries would get the same reinsurance pricing as CCRIF does, which likely leads to a significant underestimation of those costs to the country (because of economies of scale and other factors) and therefore an underestimation of likely savings. CCRIF pricing is compared against individual country direct reinsurance market coverage.

66. The cost of self-retention if the country had to retain this risk (because insurance markets were not available or countries viewed coverage as too costly) through reserves is estimated as the annual average loss plus the opportunity cost of reserves for the same risk currently covered by the CCRIF. The opportunity cost of reserves is equal to the amount of reserves necessary to provide a payout equal to the coverage limit at the exhaustion point of a country's CCRIF coverage, multiplied by the marginal opportunity cost of capital. In the spring of 2012, the average marginal opportunity cost of capital for CCRIF countries is estimated at 7.5 percent.

Findings of reassessment

67. As described in Table 4 below, compared to the cost of an individual country going directly to the reinsurance market, CCRIF pricing for hurricane coverage runs about 59 to 54 percent less expensive. For earthquake coverage, this range is from about 62 to 54 percent less expensive. The cost savings of CCRIF coverage versus the non-market-based scenario of self-retention are even greater. Compared to the cost an individual country ensuring the availability of the same amount of cover as is provided by its CCRIF policy, CCRIF cover for hurricanes is about 75 to 57 percent less expensive. For earthquake cover, this range is from about 85 percent to 58 percent less expensive.

Table 4: Comparison of original estimates of CCRIF savings with estimates of achieved savings

Coverage comparison	Appraisal estimation range	Current (actual) estimation range
Hurricane		
CCRIF savings vs Market	48-56%	54-59%
CCRIF savings vs Self-retention	65-71%	57-75%
Earthquake		
CCRIF savings vs Market	42-47%	54-62%
CCRIF savings vs Self-retention	49-53%	58-85%

Source: Appraisal stage estimates from World Bank (2007). Achieved estimates by World Bank Disaster Risk Financing and Insurance Program, with data from CCRIF (2012).

68. As can be seen from Table 4, CCRIF has outperformed the original estimates of the cost savings that it would provide almost invariably across scenarios. This is true for the estimated savings of CCRIF coverage against self-retention across countries for earthquakes and for many countries for hurricane even when the marginal opportunity cost of capital estimate used at appraisal was 12 percent and in the current estimation is only 7.5 percent (making self-retention a less expensive option in the current macroeconomic environment).

3.4 Justification of Overall Outcome Rating

Rating: Highly Satisfactory

69. Financial risk transfer through catastrophe insurance remains highly relevant to the development needs of the Caribbean Islands. They are highly exposed to adverse natural events, including earthquakes and hydrometeorological disasters such as hurricanes and excess rainfall, the latter of which may be trending toward increased frequency and severity.

70. The development objective of the trust fund and project was fully achieved: (i) CCRIF was established; 16 Caribbean countries and territories paid participation fees and purchased 29 policies, which they have renewed and increased annually, thereby reducing their financial vulnerability to natural disasters; (ii) CCRIF has made payouts totaling US\$32.2 million to members affected by covered earthquakes and hurricanes within two weeks or less of the event, thereby helping them to improve the quality of their disaster response; and (iii) CCRIF is financially solid and able to sustain current operations without further donor support.

71. CCRIF is an efficient means for its members to reduce their financial vulnerability to earthquakes and hurricanes. Their cost of catastrophe insurance through CCRIF is significantly below what they would be required to pay if they sought such insurance individually and directly through reinsurance and capital markets, or if they were to establish individual reserve funds, and this cost was reduced several times during project implementation.
72. Finally, CCRIF itself is operationally efficient. It has limited its expenditures for operating the Facility to around 5 percent of gross premium income, thus opening the opportunity to reduce its pricing and also to expand its financial capacity for research and development activities and technical assistance. The Grant was disbursed in full without any need for a closing date extension.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

N/A

(b) Institutional Change/Strengthening

73. From a raw start-up in 2007, CCRIF has rapidly become a strong institution, led by an experienced Board of Directors and supported by highly qualified professional service providers. In addition to its financial strength (see Section 3.2), CCRIF's governance structure is sound. It is well regulated by CIMA. As detailed in Section 2.2, *Implementation*, the Board of Directors has taken a number of steps to strengthen CCRIF's governance. CCRIF has consolidated its reputation as a Caribbean institution, as demonstrated by the desire of a number of other Caribbean institutions to partner with it. Positive feedback provided by respondents to the beneficiary survey (see Section 3.6) reinforces this point. In addition, although a Caribbean institution, CCRIF has global name recognition. Members of its Board and representatives of its service providers are eagerly sought as speakers and panelists to share CCRIF's experiences at conferences and other professional events around the world having to do with disaster risk transfer and management and related matters.²⁸

²⁸ Some examples include: (i) the UN Climate Change Conference, Durban, South Africa, November 28-December 9, 2011; (ii) International Workshop, "Insurance for Climate Change Adaptation for Private, Productive, and Financial Sectors," hosted by the Ministry of Finance of Peru, Lima, October 12-14, 2011; (iii) European consultation for the UNEP Finance Initiative Principles for Sustainable Insurance, hosted by Munich Re, Germany, October 25-26, 2011; (iv) Pacific Regional Capacity Building Workshop on Enhancing Access to Finance in the Agricultural Sector, hosted by UNCTAD, Fiji, October 20-21, 2011; (v) Forum for Agricultural Risk Management in Development Annual Conference, Zurich, June 9-10, 2011; (vi) 31st Annual Conference of the Insurance Association of the Caribbean, Trinidad and Tobago, June 6-7, 2011; (vii) "Responding to Climate Change in the Caribbean," conference hosted by the Institute for the Study of the Americas, London, June 13-14, 2011; (viii) meeting of the National Association of Insurance Commissioners, Texas, March 26, 2011; and (ix) Fourth United Nations Conference on the Least Developed Countries, Istanbul, May 9-13, 2011.

Providing further evidence of CCRIF's global reputation as a successful innovator, the German government funded an agreement between MCII and CCRIF to develop parametric insurance products – a livelihood protection product for small-scale entrepreneurs such as farmers, tourism operators, fishermen, and shopkeepers and a product to provide weather coverage for the portfolios of development banks' and similar institutions' loans to such entrepreneurs (see paragraph 49).

(c) Other Unintended Outcomes and Impacts (positive or negative)

N/A

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

74. A beneficiary survey was conducted in June 2011 to assess stakeholders' perspectives of CCRIF's impact and expectations for its future. One hundred invitations to participate in the survey were sent to officials in CCRIF members' disaster and emergency management agencies, meteorological services, ministries of finance, and insurance regulators. Representatives of Caribbean partner institutions were also invited to participate, as were officials from non-member countries who had participated in CCRIF professional development activities and some CCRIF scholarship recipients. Out of the 100 invitees, 50 responded, constituting a complete sample of the countries, national agencies, and regional institutions that had been contacted – a good survey response rate.

75. Respondents generally expressed appreciation for the uniqueness and attractive pricing of the products that CCRIF was able to offer as a diversified risk pool, the importance of those products as a component of their broader disaster risk management strategies, and the rapidity of its payouts, all of which they saw as providing benefits and value for money. They commended CCRIF's high level of information sharing and its flexibility and client-responsiveness. They welcomed its technical assistance program, emphasis on capacity building and professional development, and partnerships with regional organizations. They noted that CCRIF, through its products, services, and contacts, had contributed to an increased awareness among finance, economy and planning, disaster management, environment, and meteorological officials in the region of the importance of disaster risk management, a common understanding of the role that financial risk transfer can play in it, and greater interaction among them on these matters. They expressed pride in CCRIF as a Caribbean institution and as the first, and still only, multi-country, multi-peril disaster risk pool.

76. Accompanying these positive perceptions and assessments were a number of suggestions for how CCRIF could strengthen its role and operations. These included:

- Development and issuance of new products, particularly the excess rainfall product, but also products covering agriculture, tourism, and electrical utilities;

- Increased in-depth technical communications with members' officials to improve understanding of the elements of parametric insurance and how it compares with indemnity insurance, particularly how policies are triggered and payments are calculated;
- Increased use of television, radio, and social media to communicate with stakeholders;
- Development of a mechanism to take into account the cumulative impacts of two or three successive events not sufficient individually to trigger a policy; and
- Increased contact between CCRIF Board members and stakeholders.

77. The findings of the beneficiary survey played an important role in shaping CCRIF's new Strategic Plan 2012-2015 and CCRIF is carrying forward work in response to beneficiaries' suggestions.

4. Assessment of Risk to Development Outcome

Rating: Negligible to Low

78. The risk to the development outcomes is negligible to low from a financial, institutional, and political perspective. First, as discussed elsewhere in this evaluation, CCRIF is financially sustainable. Drawing on its reinsurance and using no more than US\$25 million of its own capital, which totaled about US\$114 million as of May 31, 2011,²⁹ CCRIF had the capacity in 2011-2012 to pay claims associated with a series of disasters having a modeled probability of occurring only once in 1,401 years.³⁰ Drawing on its reinsurance and using the entirety of its capital, CCRIF could withstand an extraordinary series of natural disasters having a modeled probability of occurring only once in every 10,000 years, although it would need to be recapitalized to continue operations thereafter.

79. Institutional risks to CCRIF's sustainability are also negligible to low. It has a well functioning governance structure, which the Board is further strengthening through implementation of a business continuity plan and additional measures to ensure on-going compliance with evolving regulatory requirements for captive insurance firms. CCRIF enjoys the support not only of its members, but also that of a variety of regional organizations and, in addition, has a global reputation for excellence and innovation. Its original 16 members have shown their recognition of CCRIF's value, renewing their policies annually and gradually increasing the amount of their coverage so as to reduce further their financial vulnerability to hurricanes and earthquakes. MOUs with a number of regional organizations serve to anchor it within the framework of the region's institutions. CCRIF is strengthened institutionally not

²⁹ May 31, 2011, is the end of the last financial year for which externally audited financial statements are available. For its financial year ending May 31, 2012, CCRIF's as yet unaudited financial statements show retained earnings of US\$94.6 million and total assets of US\$118.4 million.

³⁰ For 2012-2013, the top of CCRIF's combined US\$145 million of risk retention and reinsurance provides cover for a 1 in 1,125 year event.

only by the desire of donors to seek opportunities for further collaboration but also by the continuing interest of the global disaster risk management community and reinsurance industry.

80. One political risk to the project's outcomes – a risk which also has a financial dimension – is that the fiscal constraints of some members could cause them to take the difficult decision to pull out. This risk is also considered negligible to low. Haiti is likely to continue to receive donor support to cover its premium, as was anticipated at the time that Haiti joined CCRIF.³¹ For 2012-2013, the CDB signaled its intention to support Haiti's premium payment with a grant. Some CCRIF members took advantage of CDB finance to help cover their premiums in 2010-2011 and, should it become necessary, such finance would also likely again be available from the CDB. Finally, CCRIF is estimated to need only eight members in order to have a sufficiently diversified risk portfolio.³² Thus, even if some members were to pull out, CCRIF would remain a viable risk pool.
81. The Board is keenly aware of this financial/political risk and, accordingly, has continuously worked to reduce it by seeking ways to enhance the Facility's value to its members. Among such steps have been the lowering of the participation fee requirement, the successive reductions in the premium price totaling about 30 percent since the first year, the decision to provide a premium discount in years following zero-claim years, and the technical assistance program with its range of capacity building activities. CCRIF's efforts to develop an excess rainfall product respond directly to members' and others' demands and the availability of this product is expected to strengthen further members' perceptions of CCRIF's value and, indeed, to pull in new members. Finally, members' pride in CCRIF as a Caribbean institution is also likely to mitigate the risk that some might pull out.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Highly Satisfactory

³¹ See Project Appraisal Document on Proposed Grant in the Amount of SDR6 Million (US\$9 Million Equivalent) to the Republic of Haiti for a Haiti Catastrophe Insurance Project; February 6, 2007; Report No: 38540-HT. The CDB has agreed to pay Haiti's premium for 2012-2013.

³² Analysis at the time of appraisal of the catastrophe insurance projects for Dominica, Grenada, St. Lucia, and St. Vincent and the Grenadines indicated that, with US\$40 million initial reserves, the Facility would be able to reduce the insurance premiums of a pool of eight countries by more than 40 percent (on average) compared to individual catastrophe insurance, and to grow its reserves by US\$2.5 million year on average." Project Appraisal Document for Four Catastrophe Insurance Projects for the Organization of Eastern Caribbean States; Report No: 38539-LAC; February 6, 2007.

82. Bank performance in ensuring quality at entry was highly satisfactory. Project design was particularly challenging and complex as CCRIF was to be the first multi-country, multi-peril pooled catastrophe risk insurance facility. With generous PHRD grants from the Government of Japan supplementing Bank budget and with the collaboration of JSIF and the OECS Secretariat, the Bank assembled and led an expert team. The team tapped the knowledge of a wide range of public sector institutions and private sector entities with broad experience in risk modeling, financial risk transfer, and disaster risk management. The team carried out detailed risk assessments and did highly sophisticated modeling of hurricane and earthquake risk in the Caribbean to develop the HLEM that would underpin the pricing of CCRIF's policies and its financial sustainability. It also conducted extensive stakeholder consultations and provided in-depth briefings to Caribbean countries, potential donors, and others as design progressed to build potential members' interest in participating in CCRIF and donors' willingness to contribute to the trust fund to support it. The design of CCRIF's policies was tailored to respond to the specific constraints that potential members faced in obtaining affordable catastrophe risk insurance and to provide the rapid financial payout that they needed following a natural disaster. The possibilities for domiciling CCRIF were carefully studied in order to identify from among several good options the one that would best balance the need for a strong regulatory environment that could command the respect of members, donors, and reinsurers with the flexibility in oversight that would be required to support development and roll-out of CCRIF's innovative products. Sections 2.1 and 3.1 discuss these matters in greater detail.

(b) Quality of Supervision

Rating: Satisfactory

83. Bank performance during supervision was satisfactory. Supervision included the usual desk activities such as: (i) review and suggestions for improvements of terms of reference, requests for expressions of interest and proposals, and contracts with the Executive Chairman of the Board of Directors and professional services providers to be financed by the MDTF; (ii) review of audited financial statements; (iii) advice and support to the Insurance Manager and Facility Supervisor on compliance with the Bank's procurement and financial management policies; (iv) review and authorization of withdrawal applications; (v) review and comment on the Operations Manual and its periodic revisions; and (vi) review and comment on the minutes of the Board's proceedings. Field supervision missions took place at regular intervals – three to four times a year.

84. In addition to the foregoing, the Bank carried out an in-depth supervision mission following each of the Facility's first three years of operations. These missions conducted interviews with CCRIF's regulator, member officials, representatives of institutions with which CCRIF was partnering, CCRIF's reinsurers and investment manager and, of course, the Facility Supervisor, Insurance Manager, and members of the Board of Directors. The missions assessed developments with respect to CCRIF's

operations and governance, budget, risk management and investment strategies, technical assistance, partnerships and stakeholder outreach, and R&D activities. The Bank published reports on these missions.³³ While these were intended primarily for the Board of Directors and the professional service providers, they were also distributed to CCRIF's members, MDTF donors, CCRIF's partner institutions, World Bank Executive Directors representing CCRIF members, and other stakeholders.

85. Given the innovative nature of the project, the Bank provided proactive implementation support during supervision. The Bank participated actively, albeit formally as an observer, in nearly all of the meetings of CCRIF's Board of Directors and its informal sessions to develop its business strategy, objectives, and performance measures. At the Board meetings and in the three published reports on its in-depth supervision missions following each of the Facility's first three years of operations,, the Bank provided recommendations aimed at helping CCRIF to: (i) strengthen its governance structure, bring the appointment of Directors fully in line with the terms of its Trust Deed and Articles of Association, and enhance business continuity; (ii) improve the recording of, and follow-up to, Board decisions; (iii) clarify procurement practices, including with respect to matters such as retendering of contracts for professional services; (iii) clarify the roles of the professional service providers; (iv) improve donor relationships; (v) contain the operating budget; (vi) obtain independent actuarial review of CCRIF's risk model; (vii) strengthen management of the R&D program; (viii) improve the affordability of its policies; (ix) enhance transparency, outreach, and stakeholder relations to mitigate non-financial risks; (x) increase the transparency of the technical assistance program; and (xi) bring greater specificity to partnership arrangements with other Caribbean institutions.
86. The Bank's supervision added value to CCRIF's operations. As detailed in the reports on CCRIF's second and third years of operations, the Board adopted the majority of the Bank's recommendations. The formal records of the Board's deliberations and decisions also reflect CCRIF's positive response to the Bank's contributions through supervision.
87. Supervision could have been improved had the three reports on the Bank's in-depth supervision missions been published and provided to CCRIF and to others within three months after the availability of CCRIF's audited financial statements (normally available in August). This shortcoming is considered minor, given that the Bank discussed the findings of the reports and their recommendations with the Board and CCRIF's key service providers well in advance of publication of the reports.

³³ See footnote no. 14, page 12.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

88. Based on ratings of highly satisfactory for quality at entry and satisfactory for supervision, the overall rating for Bank performance is satisfactory.

5.2 Borrower Performance

(a) Government Performance

Rating: N/A (CCRIF member governments themselves had no role in project implementation, which was managed entirely by CCRIF itself).

(b) Implementing Agency's Performance

Rating: Highly Satisfactory

89. CCRIF's performance as the implementing agency for this recipient-executed trust fund was highly satisfactory. The Board of Directors showed consistent energy, commitment, and creativity in getting CCRIF up and running, consolidating its operations, and establishing the Facility as a widely recognized and respected Caribbean institution. The Facility Supervisor, Insurance Manager, Communications Consultant, Reinsurance Broker, and principal Investment Manager showed similar dedication and enthusiasm, going beyond what might have been expected of even the most professional service providers. The excitement generated by CCRIF's uniqueness and being able to contribute to its important mission no doubt played an important role in these behaviors.

90. Among CCRIF's accomplishments, as detailed in Section 2.2, *Implementation*, the following stand out in particular:

- CCRIF successfully balanced considerations of capital adequacy and value to its members, achieving both objectives simultaneously. In doing, CCRIF showed sensitivity and creativity in responding to the needs of its members and other countries in the region by:
 - reducing the premium price, lowering the participation fee requirement, and deciding to provide premium discounts following zero-claims years;
 - advancing to Barbados, St. Lucia, and St. Vincent and the Grenadines within days after Hurricane Tomas 50 percent of their expected payouts;
 - overcoming a range of data and methodological difficulties in order to develop and make available the excess rainfall product to help members reduce their financial vulnerability to this additional peril; and
 - establishing and implementing the technical assistance program to support members' efforts to build capacity in disaster risk management more broadly.

- The Board took a number of steps to strengthen CCRIF's governance with respect to appointment of Directors, budget management, records of proceedings and follow-up, and mitigation of risks to business continuity.
- With an eye to good stewardship of donor resources and the capital it received from members in the form of their participation fees and annual premiums, the Board limited CCRIF's annual operating expenditures to 5 percent of its premium income.
- CCRIF's fiduciary performance – financial management and procurement – was without shortcomings. External audits of its financial statements were unqualified. Regulatory compliance reviews by CIMA were also positive.
- The Grant was fully disbursed in advance of the closing date, without the need for any extension thereof.

(c) Justification of Rating for Overall Borrower Performance

Rating: Highly Satisfactory (Based on Highly Satisfactory rating for Implementing Agency's performance).

6. Lessons Learned

91. Preparation, supervision, and implementation of the Caribbean Catastrophe Risk Insurance Project illustrate a number of important lessons:

- **Consultations with a wide range of experts and stakeholders are important in developing and successfully launching an innovative development instrument.** In the case of CCRIF, consultations were essential to building understanding of the proposed facility, the risk modeling that would underpin its products, the nature of parametric insurance, etc. They also served to assure the CARICOM Heads that the Bank was being responsive to their request. Without this effort at consultations, it is doubtful that CCRIF's membership would have reached 16 at the outset.
- **Donor support can be essential for an innovative and untested development instrument.** The generous donor support for CCRIF to reimburse it for initial operating expenditures and pay claims within its risk retention greatly reduced the risks to its achieving financial sustainability. Without such donor support, an initial year in which claims exceeded the modeled AAL would have been a serious setback, as it might have required CCRIF to go back to its members to request recapitalization through an increase in their participation fees. It was possible to mobilize sufficient donor support because the economies of most CCRIF members are relatively small. Adequate donor grant resources to support a pilot initiative involving much larger economies would likely have been much more difficult to obtain.
- **The private sector expertise and hands-on knowledge of relevant markets is vital to the success of a project that seeks to respond to a market failure.** In the case of CCRIF, the Executive Chairman and the two Board members appointed just prior to the Facility's launch had private sector experience in

- banking, asset management, indemnity insurance, catastrophe insurance, and reinsurance – in the Caribbean as well as elsewhere. Their experience was a key component in decisions regarding matters such selection of service providers, policy conditions, pricing, and client relations.
- **When public funds – e.g., capital contributions from donors and beneficiary governments, both ultimately provided by taxpayers – support an independently and commercially managed entity, it is important that those managing the entity have experience with stewardship of public resources.** In CCRIF’s case, the two Directors who were appointed soon after the Facility’s launch had experience in senior positions in government and multilateral institutions, along with their expertise in finance, insurance, and banking. The Executive Chairman also had experience in a public sector agency. Their contacts with governments in the region and understanding of the regulatory and other requirements for accountability for public funds were an important complement to their colleagues’ private sector experience. As Directors have departed and new ones have been appointed, CCRIF has maintained this public/private sector balance, with a strong focus on governance and regulatory compliance.
 - **On-going communications with clients and other stakeholders are essential in piloting successfully an innovative development solution.** To this end, specialized professional expertise in developing and carrying out multi-media communications strategies is required. Despite the extensive consultations that were carried out leading up to CCRIF’s launch, continuous efforts have been required to improve understanding of its mission, the nature of parametric products, and the range of its services. The progressive ramping up of CCRIF’s outreach to the public and specialized stakeholders has done much to solidify its standing as a Caribbean institution and understanding of its mission, products, and value. As was clear from the beneficiary survey, and as is recognized in CCRIF’s 2012-2015 Strategic Plan, a high level of well-targeted communications will need to be maintained.
 - **A lean organizational structure can be very effective.** CCRIF achieved considerable cost savings and avoided institutional rigidities by remaining a “virtual” organization without a physical office and by contracting externally for professional services rather than acquiring a roster of direct employees. This said, as time passes and Directors and service providers change, it is important to put in place, as CCRIF is doing, arrangements to ensure institutional memory and business continuity.
 - **In a highly innovative project, it is important for Bank supervision to give the implementing agency scope for creativity and flexibility, while still ensuring compliance with Bank operational policies.** When the project implementation is in the hands of experienced and highly professional staff, too heavy a hand can result in poor use of available expertise, stifled creativity, and missed opportunities. The extent of CCRIF’s partnership arrangements, the scope of its technical assistance and professional development activities, which are valued by its members, the on-going refinement of CCRIF’s multi-peril loss estimation model, and its development of the excess rainfall product have much to do with the fact that the Bank did not impose a static view of the project but,

instead, created the space for CCRIF to respond to emerging needs and opportunities. And CCRIF's dynamism in this regard has had much to do with consolidating its reputation as a valued Caribbean institution.

7. Comments on Issues Raised by Grantee/Implementing Agencies/Donors

a) Grantee/Implementing Agencies

92. The Bank appreciates the comments from the Board of Director and staff of CCRIF, agreeing with the assessment of the ICR, and is grateful for the information and suggestions that they provided to improve its depth and clarity.

(b) Cofinanciers/Donors

93. The Bank welcomes the comments from the CDB, which made a significant contribution to the MDTF to support CCRIF's establishment and initial operations. It is gratified that the CDB concurs with the assessment of CCRIF's on-going importance and relevance in helping raise awareness of and capacity for effective disaster risk management in the region. The Bank appreciates the CDB's view that CCRIF has continually focused on the efficient provision of services demanded by its members, has accomplished much in its short history, and will continue to grow in its contributions to the region.

(c) Other partners and stakeholders

94. The Bank gratefully acknowledges the comments from CIMH, which was the first regional organization with which CCRIF signed a MOU and which has been, and continues to be, an active partner in generating knowledge and strengthening institutional capacity for disaster risk assessment and management in the region. CIMH provided valuable suggestions for enriching the assessment of the ICR.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Total Baseline Cost	30.92	71.00	229.60
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	30.92	71.00	229.62
Project Preparation Costs ³⁴	1.80	1.80	100.00
Bank Administrative Fee ³⁵	0.63	1.15	182.54
Total Financing Required	33.35	73.95	221.74

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Trust Funds ³⁶		1.80	1.80	100.00
Free-standing Single Purpose Trust Fund ³⁷		31.55	72.14	228.65

³⁴ Includes only PHRD grant for project preparation. Does not include Bank budget resources.

³⁵ The Bank's fee for administering the MDTF was 2.0 percent of contributions.

³⁶ PHRD grant for project preparation.

³⁷ "Appraisal Estimate" = Donor contributions to the MDTF at the time of the IBTF dated March 2, 2007. "Actual/Latest Estimate" = Total donor and IBRD contributions of US\$67.43 plus interest income on undisbursed MDTF balance of approximately US\$4.7 million. The amount of the "Free-standing Single Purpose Trust Fund" in (b) exceeds "Total Financing Required" in (a) due to deduction from the latter of the Bank's 2 percent fee for administering the MDTF.

Annex 2. Outputs by Component

Component 1: Establishment of CCRIF

- CCRIF's certificate of incorporation in the Cayman Islands and the Memorandum and Articles of Association of the company were issued on February 27, 2007.
- CCRIF's license as an insurer under the laws of the Cayman Islands was issued on May 23, 2007.

Component 2: CCRIF Operations

Item	US\$	Percent of Total
Risk Transfer (reinsurance)	36,247,652	51.05
Payouts	32,179,468	45.32
Facility Supervision Fees	1,587,297	2.24
Board fees/expenses	541,803	0.76
Corporate Communications	170,956	0.24
Audit	158,806	0.22
Insurance Manager Fees	111,921	0.16
Total	70,997,902	100.00

Annex 3. Economic and Financial Analysis

1. Historically, most developing countries have relied on *ex post* sources of financing (e.g., budget reallocation, debt issuance, and donor aid) to defray relief, recovery, and reconstruction costs following a disaster. In the last decade, however, governments and the international community at large have demonstrated increased interest and effort to shift toward *ex ante* risk financing and insurance strategies to guarantee immediate access to liquidity following a disaster and to better manage budget volatility arising from disasters. In the Caribbean, Hurricane Ivan's devastating impacts on the populations and economies of multiple CARICOM states in 2004 catalyzed demand for *ex ante* budget protection against natural disasters.

Financial and Economic Impact of Natural Disasters in the Caribbean

2. CARICOM states are more exposed to natural disaster events than many other countries in the world; in terms of hazard risk, the frequency of hurricane and earthquake events is high, and in terms of financial risk, the impact on each country's fiscal and macroeconomic stability is significant. The vulnerability of the region is heightened by the fact that most Caribbean countries' economies suffer from a lack of diversification, depending mostly on tourism and commodity exports. These sectors suffer dramatically in the event of a disaster, thus exacerbating the short- and long-term economic impact. The countries themselves are also extremely small geographically, and natural disasters impact the full economic potential of the country as opposed to localized impacts that occur in larger countries.
3. The CARICOM states have relied on *ex post* financing mechanisms to fund their post-disaster needs. Given the fiscal and macroeconomic impact of disasters, these mechanisms are extremely costly. Furthermore, most CARICOM states have little to no fiscal space for *ex post* budget reallocations, as most are able to reallocate less than 1 percent of their annual budgets. This situation often forces them to borrow from international capital markets at high interest rates following a disaster event, further increasing their overall recovery costs.
4. Fiscal Impacts
 - a. *Adverse impact on public finances:* A country's fiscal balance weakens following natural disasters as the domestic tax base shrinks and expenditure needs escalate. This deterioration often adds to public debt, which could affect macroeconomic performance beyond the short-term and result in higher inflation and lower investment potential. For example, Hurricane Ivan hit the small Caribbean island of Grenada in September 2004, causing an estimated 200 percent of GDP in damages across the island. Faced with the overwhelming costs of the event, the state was forced to approach its creditors for a voluntary restructuring of the island's public debts, extending its debt service payments by 20 years and adding significantly to its overall cost of funds.

- b. *Deterioration in the balance of payments:* The current account balance weakens as natural disasters impair export capacity due to deterioration of infrastructure and transportation services, and studies have indicated that the impact can be as great as 10 percent of GDP.³⁸ On average, the adverse effects on the external current account balance last two to three years in the Caribbean.³⁹ The median reduction in output caused by natural disasters in the Caribbean is approximately 2.2 percent, mostly reflecting damages to agricultural production.⁴⁰ Natural disasters also increase imports due to reconstruction needs and disruptions in domestic supplies. Foreign grants, remittances or reinsurance payments from abroad often mitigate the adverse impact, but are usually insufficient to offset the initial damage. While private capital inflows could also help mitigate the deterioration in the balance of payments, they are unlikely to offset it or to be immediately available in the Caribbean countries.
- c. *Increase in fiscal deficit:* The fiscal deterioration in the wake of natural disasters typically entails a marked increase in expenditures related to emergency assistance and reconstruction efforts coupled with relatively small reductions in government revenues and grants. In the Caribbean, higher capital spending is seen during the year in which the disaster occurs, followed by compressions in current expenditures afterwards.⁴¹ Furthermore, productive public spending and broad investments in development activities are crowded out as a result of reduced fiscal space.
- d. *Escalating cost of debt:* A country's fiscal flexibility is ultimately dependent on its initial fiscal position, its financing options, and its debt sustainability levels. Nearly all the Caribbean countries are highly indebted, and already face relatively high costs of debt, ranging from 6 to 8 percent for 10-year bonds.⁴² In the face of a natural disaster, sovereign bond spreads increase 1-2 percent on average, thus raising the cost of borrowing for affected governments. The results of piece-wise sovereign spread analysis indicate that these price effects remain for roughly 6-9 months after a disaster.⁴³ In particular, the CARICOM states often lack adequate revenues and fiscal space to deal with the increased costs of debt, especially in terms of the debt service payments they are forced to make in the immediate future.

³⁸ Rasmussen, Tobias N., 2004, "Macroeconomic Implications of Natural Disasters in the Caribbean," Working Paper 04/224 (Washington, DC: The International Monetary Fund).

³⁹ Ibid.

⁴⁰ Benson, Charlotte, Michael, F. V., and Robertson, A.W., 2001, "Dominica: Natural Disasters and Economic Development in a Small Island States," Disaster Risk Management Working Paper Series, No.2 (Washington DC: The World Bank).

⁴¹ Crowards, Tom, 2000, "Comparative Vulnerability to Natural Disasters in the Caribbean," Staff Working Paper No.1/00 (St. Michael, Barbados: Caribbean Development Bank).

⁴² Bloomberg, 14-May-2012.

⁴³ Ozcan, Banu, 2005, "Market Convergence, Catastrophe Risk, and Sovereign Borrowing: An Empirical Analysis for Emerging Market Countries," DAI-A 66/12. (Medford, MA: Tufts University).

- e. *Limited donor contributions:* Underinvestment in protective risk mitigation measures is a common symptom across the Caribbean, as governments expect that others will provide support if a disaster occurs. However, concerns about this approach have become more pressing given the finite willingness of donors to provide financial support, coupled with the rising trend in the frequency and magnitude of natural disasters. Grants and concessional loans from multilateral institutions and bilateral donors designed to finance post-disaster mitigation and reconstruction costs are also often earmarked for specific projects and initiatives, as opposed to overall budget support.
5. Macroeconomic Impacts
- a. *Declines in GDP:* Within the context of the Caribbean countries, the impact of natural disasters is most significant on the agriculture, fishing, and tourism industries, both in terms of direct monetized losses of physical destruction and indirect losses associated with business interruption. By extension, natural disasters tend to make output more volatile than otherwise, resulting in immediate consequences for a country's GDP figures. Real GDP growth in the Caribbean slowed down on average about 3 percent in a disaster year during the period between 1970 and 1997, often followed by a sharp rebound in the following year and a moderate slump afterwards.⁴⁴
 - b. *Depreciation and inflation pressures:* Due to the weak current account balance and investors' concerns about future losses of local companies, the exchange rate of the disaster-affected country will face depreciation pressures. Inflationary pressures will also build due to an excess of money holdings in the face of reduced incomes and possible concerns about currency depreciation, in addition to monetization of the increased budget deficits.
 - c. *Negative regional spillovers:* Natural disasters could affect countries that have not been hit directly. Typically, spill-over effects of disasters are most pronounced in terms of regional input-output networks due to damages suffered near shared ports and disruptions in cross-border supply chains. Financial linkages are also evident, as there is often a rise in sovereign credit spreads and local banks and insurance companies are exposed to cross-border fluctuations.
6. An analysis of the overall fiscal and macroeconomic impacts of past natural disasters suggests that, on average:
- a. Impacts on GDP were significant, particularly in the second and third years after a disaster strikes. This is presumably the case because the differential

⁴⁴ Ibid.

delays in the year of the disaster and the year immediately following the disaster were evened out.

- b. The negative impacts on the trade balance were significant, primarily due to the initial increase and subsequent decrease in imports.
- c. An initial peak in government capital expenditure growth was followed by low growth rates, while government current expenditure showed a marked drop in growth two years after the disaster.

Table 1: Average impact of natural disasters on fiscal and macroeconomic variables in CARICOM states⁴⁵

Year	Inflation	GDP Growth	Export Growth	Import Growth	Trade Bal.	Govt. current exp. growth	Govt. capital exp. growth	External Debt Growth
-3,-2,-1	8.1	5.4	15.3	11.0	-46.0	5.2	9.5	17.6
0	9.0	2.3	5.0	19.5	-65.5	7.2	26.2	20.6
1	7.6	5.7	15.0	13.0	-72.7	7.6	1.0	13.5
2	6.5	1.9	11.9	1.5	-70.7	0.1	0.7	13.5
3	7.9	3.0	16.2	1.1	-56.5	5.4	5.6	16.2

The Approach for the Caribbean: Catastrophe Coverage Using Risk Pooling

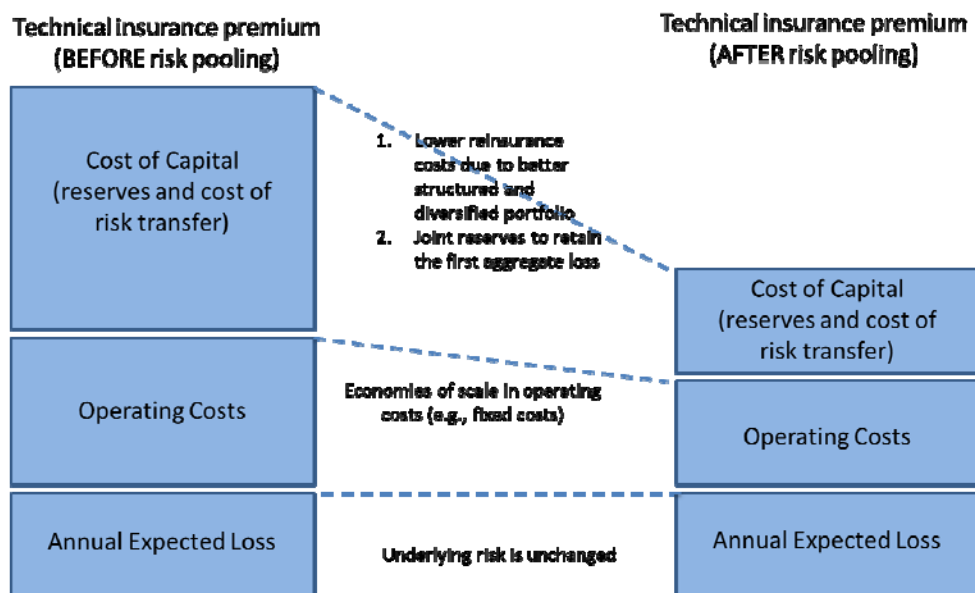
- 7. In this context, the CARICOM governments, the World Bank, and other development and donor partners decided to develop a disaster risk financing mechanism that would guarantee an immediate injection of liquidity for the government following a major disaster. The mechanism had to meet world-class standards of reliability, transparency, and affordability. The most cost-efficient design would combine risk retention for low risk layers (prohibitively costly to transfer to the private sector) and risk transfer for high risk layers. In order to accomplish this, the mechanism had to enable maintenance of financial reserves in severely fiscally constrained environments and open access to international reinsurance markets for countries for which coverage was not available.
- 8. The catastrophe risk vehicle, CCRIF, adopting a risk pooling approach, addresses these constraints and provides numerous financial benefits to the CARICOM states. Risk pooling reduces the cost of capital for coverage through diversification and portfolio structuring. Because each country's exposure is unique, structuring a diversified portfolio of countries and perils, hurricane and earthquake reduces the cost

⁴⁵ Ibid.

of capital,⁴⁶ reserves, and insurance. In addition, due to economies of scale (i.e., fixed costs are spread across participating countries), risk pooling reduces operating costs to participating members.

9. Covering diverse risks implies that payments will trigger with more regularity and less uncertainty with regards to the timing and amount of capital that needs to be available for payouts. Therefore, less capital is required per country to be held in a risk reserve or paid as part of an insurance premium in order to ensure solvency for an event of a specified return period. Importantly, the underlying risk of each country is unchanged, so pricing of coverage with risk pooling does not distort price signals to participants about the cost of their exposure to natural disasters.⁴⁷ Figure 1 illustrates these effects.

Figure 1: Catastrophe Coverage Pricing and Risk Pooling



Source: World Bank Disaster Risk Financing and Insurance Program (2011).

10. For the abovementioned reasons, risk pooling through CCRIF results in a lower probable maximum loss (PML)⁴⁸ compared to the sum of the PMLs for all participating countries. This is the case because multiple catastrophic events are highly unlikely to affect multiple states in a given year. For example, the likelihood of a severe hurricane impacting one country may be 5 percent every year, but the likelihood of three severe hurricanes impacting three different countries is likely much lower.

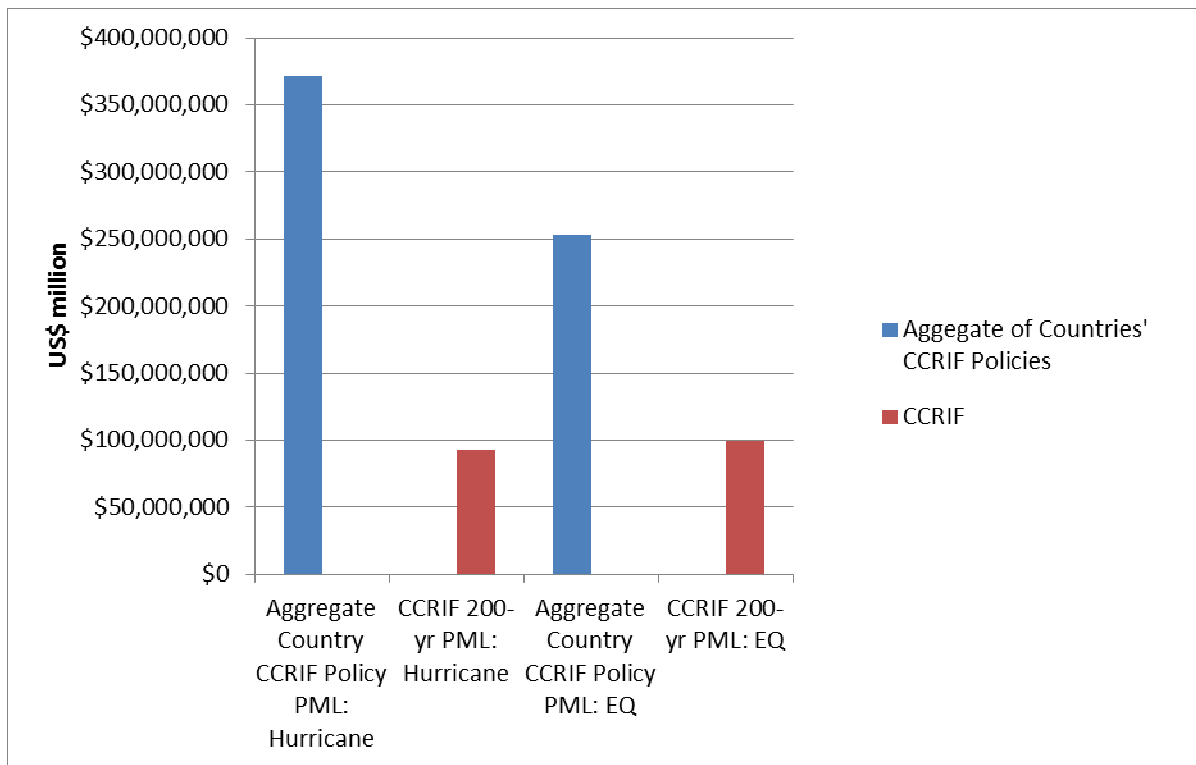
⁴⁶ Cost of capital is defined as the amount of capital required to be accessible to ensure solvency in the case of catastrophe.

⁴⁷ Furthermore, the parametric nature (relying on an event's parameters as a proxy for actual losses) of CCRIF insurance assures that the AEL is an objective measure of each country's exposure to perils.

⁴⁸ Probable maximum loss is defined as the largest likely loss from a specific catastrophic event for a given return period.

11. Figure 2 illustrates the PML for each country’s hurricane and earthquake policies under CCRIF versus the PML for the pooled Facility from a 1-in-200 year event for hurricane and earthquake, respectively. Due to limitations in data availability, the aggregate loss for the individual country depends on the coverage limit and exhaustion point under its CCRIF policy (which varies across countries).⁴⁹ As is clear below, the pooled loss for a 1-in-200 year event to the CCRIF portfolio for either hurricane or earthquake results in a much lower PML than the aggregate possible losses across countries for the risk transferred to CCRIF for events of different (primarily shorter) return periods.

Figure 2: Benefits of Risk Pooling - PMLs under CCRIF policies



Source: World Bank Disaster Risk Financing and Insurance Program, with data from CCRIF (2012).

12. In addition to the benefits of risk pooling and lower operating costs, there are many additional financial benefits of the CCRIF approach that are difficult to quantify in this assessment but are anecdotally suggested. Such benefits could include reduction in disaster losses due to improved land-use planning informed by catastrophe risk

⁴⁹ Precise coverage levels vary across policies, thus the amount and layer of risk being contributed varies across countries. The aggregate columns are the sum of all of the coverage limits for each peril in the CCRIF portfolio. In most cases, the maximum protection for a country is less than a 1-in-200 year loss, while some countries have coverage that is greater protection than 1-in-200 year. The pooled loss for a 1-in-200 year event to the CCRIF portfolio for both hurricane and earthquake, however, results in a much lower PML than the aggregate possible losses across countries for events of different (primarily shorter) return periods.

modeling, improved decision-making linked to capacity building services provided by the Facility, etc.

Financial analysis of catastrophe coverage for CARICOM states through CCRIF

13. The financial benefits of participation in CCRIF can be assessed through a comparison in the long-term average price of coverage for CARICOM governments with CCRIF compared to (i) the case where the country would have to individually go to the reinsurance market to buy the same coverage and (ii) the case where the country would self-retain the same amount of catastrophic risks because insurance would not be available on the market. In addition, these results can be compared to those estimated at the beginning of the CCRIF project. Finally, the role of donor capitalization of the CCRIF in reducing insurance costs to participating countries and increasing its financial resilience in high-risk layers can be assessed.
14. This analysis uses CCRIF's Dynamic Financial Analysis (DFA) model, a sophisticated actuarial model that computes insurance pricing and survivability metrics using different input portfolios, reinsurance pricing models, and starting capitalizations for the Facility, among many other variables. The policy schedule used for this analysis is that selected by participating countries for the policy period 2012/13. Coverage choices vary across countries. Attachment and exhaustion points for hurricane coverage range from 15 to 25 years and from 80 to 250 years, respectively; and for earthquakes, from 20 to 50 and from 70 to 250 years, respectively. The amount of risk ceded, or ceding percentage, also ranges from less than 5 percent to greater than 85 percent for hurricane and less than 10 percent to greater than 90 percent for earthquake. Three countries do not purchase earthquake insurance. The differences in coverage choices impact the cost of coverage for the country.
15. The price of coverage through CCRIF is estimated as the stable long-term premium to annual average loss (AAL) ratio using the CCRIF June 1, 2012, forecasted financial position (commonly referred to as the multiple). This pricing is captured as the assessed long-term CCRIF multiple for the 2012/13 policy schedule selected by participants for hurricane and earthquake. For confidentiality reasons, the long-term average pricing multiple for CCRIF cannot be disclosed; it is compared to the alternatives, however, by expressing the percentage of cost-savings from using CCRIF versus the alternatives (Table 2).
16. The individual country costs of transfer of the same risk directly to the international market are estimated by using the reinsurance pricing algorithm that is used to estimate CCRIF's reinsurance costs. This then assumes that individual countries would get the same reinsurance pricing as CCRIF does, which likely leads to a significant underestimation of those costs to the country (because of economies of scale and other factors) and therefore an underestimation of likely savings. CCRIF pricing is compared against individual country direct reinsurance market coverage in *Savings vs Market* (Column A) in Table 2 below.

17. The cost of self-retention if the country had to retain this risk through its own reserves (because insurance markets were not available or countries viewed coverage as too costly) through reserves is estimated as the annual average loss plus the opportunity cost of reserves for the same risk currently covered by the CCRIF. The opportunity cost of reserves is equal to the amount of reserves necessary to provide a payout equal to the coverage limit at the exhaustion point of a country's CCRIF coverage, multiplied by the marginal opportunity cost of capital. In the spring of 2012, the average marginal opportunity cost of capital for CCRIF countries is estimated at 7.5 percent. It is noted that at the time of CCRIF project preparation, the marginal opportunity cost of capital was set at 12 percent – thus, for insurance coverage to continue to be more cost-effective in the current macroeconomic environment, it must remain less expensive compared to this lower opportunity cost. CCRIF pricing is compared against self-retention for this same risk in *Savings vs Self-retention* (Column B) in Table 2 below.

Table 2: Estimated CCRIF Long-term Pricing Comparisons⁵⁰

Country	Savings vs Market (A)	Savings vs Self-retention (B)
Hurricane		
Anguilla	55.59%	63.39%
Antigua & Barbuda	56.24%	65.39%
Bahamas	54.61%	60.03%
Barbados	56.29%	65.66%
Belize	57.86%	70.81%
Bermuda	57.43%	69.44%
Cayman Islands	57.35%	69.44%
Dominica	58.89%	75.01%
Grenada	58.77%	74.03%
Haiti	53.85%	57.34%
Jamaica	57.01%	68.06%
St Kitts & Nevis	55.80%	70.47%
Saint Lucia	57.68%	63.87%
St Vincent & the Grenadines	56.20%	65.32%

⁵⁰ For CCRIF pricing and for individual pricing, premium multiples are computed by finding the long-term average multiple for each country if the multiple for all countries is set at the CCRIF multiple of the country's AAL for the first year (in this case 2012/13) and thereafter allowed to float in such a way that countries are charged external reinsurance costs in proportion to their AAL, CCRIF risk retention costs as cost of capital in proportion to country coverage limit, and CCRIF overhead in proportion to AAL. Using the DFA model, this analysis is conducted over many years so that an average multiple can be computed for each country. This average multiple is used for the comparisons in Table 2.

Trinidad & Tobago	57.49%	69.83%
Turks & Caicos Islands	55.01%	61.39%
Earthquake		
Anguilla	61.87%	83.87%
Antigua & Barbuda	60.80%	80.44%
Bahamas	n/a	n/a
Barbados	61.02%	81.17%
Belize	60.08%	78.17%
Bermuda	n/a	n/a
Cayman Islands	58.52%	73.03%
Dominica	59.11%	75.06%
Grenada	60.46%	79.46%
Haiti	54.07%	57.95%
Jamaica	57.86%	70.85%
St Kitts & Nevis	57.44%	84.84%
Saint Lucia	62.13%	69.41%
St Vincent & the Grenadines	60.60%	79.85%
Trinidad & Tobago	55.23%	61.87%
Turks & Caicos Islands	n/a	n/a

Source: World Bank Disaster Risk Financing and Insurance Program, with data from CCRIF (2012).

18. The substantial long-term cost-savings afforded to CARICOM states by purchasing catastrophe coverage through CCRIF is evident in Table 2. Compared to the cost of an individual country going directly to the reinsurance market, CCRIF pricing for hurricane ranges from about 59 to 54 percent less expensive. For earthquake, this range is from about 62 to 54 percent less expensive. Two caveats are reiterated here: (i) each country chooses a different policy schedule and pricing is affected by the parameters of the coverage; and (ii) pricing for individual coverage direct from the market uses the same reinsurance pricing algorithm as the CCRIF, so the resulting estimates are likely underestimating the true cost of this cover. While the additional savings from approaching the market through CCRIF are masked by the analysis, it does convey the primary drivers of the premium reduction, mainly risk pooling but also the reserves of the Facility.
19. Furthermore, the cost-savings of CCRIF coverage versus the non-market-based scenario of self-retention are even greater, as illustrated by Column B in Table 2. Compared to the cost for an individual country ensuring the availability of the same amount of cover as is provided by its CCRIF policy, CCRIF cover for hurricane ranges from about 75 to 57 percent less expensive. For earthquake, this range is from about 85 percent to 58 percent less expensive.
20. Long-term average savings estimated with CCRIF's current parameters have also outperformed the original estimates of the cost savings that it would provide almost invariably across scenarios (Table 3). Impressively, this is true for the estimated savings of CCRIF coverage against self-retention across countries for earthquakes

and for many countries for hurricane even when the estimated marginal opportunity cost of capital used at the time of appraisal was 12 percent and in the current estimation is only 7.5 percent (making self-retention a less expensive option in the current macroeconomic environment).

Table 3: Original Estimates of CCRIF Savings and Current Estimated Achieved Savings

Coverage comparison	Pre-implementation estimation range	Current (actual) estimation range
Hurricane		
CCRIF savings vs Market	48-56%	54-59%
CCRIF savings vs Self-retention	65-71%	57-75%
Earthquake		
CCRIF savings vs Market	42-47%	54-62%
CCRIF savings vs Self-retention	49-53%	58-85%

Source: Pre-implementation estimates from World Bank (2007). Achieved estimates by World Bank Disaster Risk Financing and Insurance Program, with data from CCRIF (2012).

The Role of Donor Capital

21. At the outset, a multi-donor trust fund (MDTF) was created to support CCRIF's establishment and initial operations. Donors' contributions totaled about US\$67.4 million; with net interest income this amount was brought to about US\$71.0 million. These resources were not used for a direct investment in CCRIF, but rather to reimburse CCRIF for its major operating expenditures, including risk transfer costs, and for claims paid within its risk retention during its start-up phase. By defraying these costs, the MDTF enabled CCRIF to conserve the members' participation deposits and the bulk of its premium income. In this way, the donors indirectly helped CCRIF to build its risk bearing capacity more quickly than it could otherwise have done to a level sufficient to assure its financial sustainability as an independent entity over the long-term. A strong capital base also allows CCRIF to retain more of the risk through a pooled reserve while transferring to the reinsurance market the higher-capacity layers which it has insufficient capital to retain, but which cost less to reinsure than the lower layers of risk. Over time, this strategy tends to reduce the Facility's expenditures on reinsurance, increase the financial security of the Facility, and decrease the premium required to be charged to participants.
22. The indirect impact of the donors' contributions on CCRIF's ability to grow its capital and financial sustainability can be analyzed by reducing the CCRIF retention to the amount estimated for what CCRIF would have been able to retain without support from donors and then comparing the performance metrics for these two scenarios. In this analysis, the 2012 retention is reduced by 60 percent, and this 60 percent worth of what would have been retained is spread across the higher risk layers

transferred to the international reinsurance market. As with the other analyses, under this scenario, the starting point, Year 1, is 2012. In years 2 and 3, CCRIF is assumed to have been able to increase its retention by 25 percent and 20 percent, respectively, per year, and then stabilize. These assumptions are based on best estimates provided by catastrophe risk modeling experts of the Facility.

23. Key survivability metrics for this analysis are provided in Table 4. Evidently, the Facility performs better across all metrics with the contribution of donor capital. The year-end capital of the Facility and its growth are both improved over time with the donors’ contributions. Also noteworthy is the role of donor capital in the survivability of the Facility. With the contribution of donor capital, the minimum survivability level experienced by the Facility over ten years remains at a 10,000 year event. This remains well above the minimum solvency requirements (1-in-200 year event return period) set in the European Union’s Solvency II Directive.⁵¹ If donor capital is removed, however, then the minimum survivability of the Facility over ten years dips to a 1-in-175 event, falling below the minimum requirements set by the “best practice” standard.

Table 4: CCRIF survivability metrics with and without donor capital

Time period	With Donor Contributions	No Donor Contributions
Year-end capital		
5 years	116,717,361	49,420,994
10 years	126,720,721	56,739,203
Retained earnings		
5 years	11,611,441	9,315,074
10 years	21,614,801	16,633,283
Sustainability		
5 years	100.00%	99.98%
10 years	100.00%	99.43%
Survivability		
10 year average	10,000	4,260
Min over 10yrs	10,000	175

Source: CCRIF (2012).

⁵¹ Solvency II is an EU Directive that harmonizes insurance regulation across Europe and sets strict risk management standards – some of the strictest in the world – that are expected to set the standard of best practice for insurance companies operating in international markets. Solvency II is anticipated to come into effect in 2014.

Conclusion

24. This financial analysis has illustrated that CARICOM states can significantly increase their financial resilience to catastrophes through *ex ante* disaster risk financing and insurance. The analysis has demonstrated that the CCRIF approach has proved the most cost-effective option due to risk diversification, portfolio structuring and economies of scale in operating costs. The Facility also provides numerous other benefits, including timely payouts in the case of a triggering event, which are difficult to quantify in this analysis. This financial analysis has proven, however, that even without these intangible savings and despite the reductions in the expense of maintaining reserves since the original analysis,⁵² CCRIF coverage provides substantial savings over individual countries directly approaching the reinsurance market or self-insuring the same risk transferred through their CCRIF policies. Finally, it has demonstrated that the MDTF set up to support the Facility has increased all essential survivability metrics.

⁵² The marginal opportunity cost of capital for the region has decreased from 12 percent to 7.5 percent between 2007 and 2012 primarily due to macroeconomic conditions.

Annex 4. Grant Preparation and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending/Grant Preparation			
Francis Ghesquiere	Senior Urban Specialist	LCSUW	
Olivier Mahul	Senior Insurance Specialist	FPDSN	
Lisa Lui	Senior Counsel	LEGOP/ LEGLA	
Atsuko Okubo	Senior Counsel	LEGCF	
Xiomara Morel	Senior Finance Officer	LOAG1	
Marc Forni	Consultant	LCSUW	
Ross Gartley	Consultant	LCSUW	
Maricarmen Esquivel	Consultant	LCSUW	
Ana Daza	Language Program Assistant	LCSUW	
Supervision/ICR			
Carlos Rufino Costa Posada	Consultant	LCSUW	
Todd W. Crawford	Consultant	LCSUW	
Maricarmen Esquivel	Consultant	LCSUW	
Marc S. Forni	Senior Disaster Risk Management Specialist	SASDU	
Ross Alexander Gartley	Disaster Risk Management Specialist	LCSUW	
M. Mozammal Hoque	Senior Financial Management Specialist	LCSFM	
Svetlana V. Klimenko	Senior Financial Management Specialist	LCSFM	
Patricia E. Macgowan	Consultant	LCSPT	
Olivier Mahul	Program Coordinator	FCMNB	
Andrew Mitchell	Consultant	LCSUW	
Ulrich Cedric Myboto	Consultant	LCSUW	
Atsuko Okubo	Senior Counsel	LEGCF	
Edith Ruguru Mwenda	Senior Counsel	LEGA	
Jonathan Palin	Consultant	LCSUW	
Rolande Simone Pryce	Senior Country Officer	LCC3C	
Yingwei Wu	Senior Procurement Specialist	LCSPT	
Ana Daza	Language Program Assistant	LCSUW	

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only) ⁵³	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
Total:	0.0	0.00
Supervision/ICR		
Total:	6.28	76.10

⁵³ Staff weeks and USD thousands are for FY 2012 only. In previous years, the costs of preparation and supervision were charged to: (i) OECS Catastrophe Insurance Project (P094539); and (ii) Haiti Catastrophe Insurance Project (P104690). These two projects provided IDA grants to Dominica, Grenada, St. Lucia, St. Vincent and the Grenadines, and Haiti to cover their CCRIF participation fees and all or a portion of their annual premiums for the first three years of membership. As these projects are integrally related to the CCRIF project (P108058), it is not possible to assign a specific portion of the costs to any one of the three.

Annex 5. Beneficiary Survey Results

Please refer to the Final Report on the Beneficiary Survey, available on the CCRIF website at:

<http://www.ccrif.org/publications/ccrif-stakeholder-analysis>

Annex 6. Stakeholder Workshop Report and Results
N/A

Annex 7. Summary of Grantee's ICR and/or Comments on Draft ICR



February 7, 2012

Mr. Todd Crawford
ICR Primary Author
World Bank

RE: CCRIF Implementation Completion and Results Report
Response by the CCRIF

Dear Mr. Crawford:

The board of directors and staff of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) appreciate the opportunity to comment on this draft of the Implementation Completion and Results Report completed by the staff of the World Bank.

After a thorough review of this document, I must point out that the general consensus of the CCRIF board and staff is agreement with your conclusions and a sense of a job well done by the CCRIF team and the Bank. I have attached our very few comments for your consideration.

Many thanks for sharing this draft with us.

Sincerely,

Milo Pearson
Executive Director

cc: CCRIF Board of Directors
Simon Young
James Rawcliffe

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Comments from Caribbean Development Bank

From: Faye Hardy <barnesf@caribank.org>
To: "tcrawford@worldbank.org" <tcrawford@worldbank.org>
Date: 06/13/2012 09:06 PM
Subject: RE: Caribbean Catastrophe Risk Insurance Facility -- World Bank
Implementation Completion and Results Report

Dear Todd,

Thanks for the opportunity to comment on the draft ICR. It provides a comprehensive statement on the problems that occasioned the need for CCRIF, and the entity that grew to fulfill those needs. It is highly encouraging to note that the World Bank's expectations at the inception of the project were in many ways surpassed, and that acknowledgement was made of the growth of CCRIF as a regional entity and an integral and valuable element in the development network of the Caribbean region. The recognition of CCRIF's qualities of strong governance and internal controls, of dynamism and responsiveness to members' needs were also pleasing to note.

CDB considers CCRIF's role to be vital in the region in terms of raising awareness of disaster risk management, increasing opportunities for collaboration among complementary regional institutions and governments in this area, and providing risk management solutions of an international standard within the region. Natural disasters have the potential to be highly disruptive to the development mandate of the Caribbean region with which CDB, among others, has been entrusted, and CCRIF's interventions help to contain the extent of that disruption in the immediate aftermath of those events. CCRIF's technical assistance grants also provide extremely useful opportunities for strengthening the capacity in the region. CDB will continue to support CCRIF's efforts by assisting members with financial and other resources, where feasible to do so.

CCRIF's focus has continually been on the efficient provision of the services requested or required by its members. It has, in its short history, accomplished much, and its continued introspection and quest for improvement in processes and products should ensure that it continues on a path of growth and relevance to the disaster risk management strategy for the region.

I noted two edits required:

- 1) on page vi, last paragraph: an unfinished sentence needs clarification/completion - "...stability to CCRIF's until becoming self-sustainable"
- 2) page 2, the estimated loss on the first line of the table is shown as "26,5000". You may need to move the comma.

With best regards,
Faye

From: tcrawford@worldbank.org [mailto:tcrawford@worldbank.org]
Sent: Tuesday, May 29, 2012 3:40 PM
To: Faye Hardy
Subject: Fw: Caribbean Catastrophe Risk Insurance Facility -- World Bank
Implementation Completion and Results Report

Dear Faye,

The World Bank prepares an Implementation Completion and Results Report (ICR) for each project that it supports once the financing for that project has been completed. The multi-donor trust fund which was created in 2007 in order to establish the Caribbean Catastrophe Risk Insurance Facility and support its initial operations has been fully disbursed and CCRIF is now operating without donor support. As the administrator of the multi-donor trust fund and a contributor to it, the Bank has now prepared an ICR for the project. The ICR reviews the preparation of the project and developments during its implementation. It assesses the Bank's performance during project preparation and its implementation and also the performance of the executing agency -- in this case, CCRIF - - during project implementation. The ICR documents the results achieved and how those compare with the expected results. It also aims to synthesize the knowledge gained from the project and the lessons that can be learned from its design and implementation with a view to benefiting similar projects in the future.

The views of stakeholders greatly enrich an ICR. The Caribbean Development Bank was a generous contributor to the multi-donor trust fund and, as such, has played a vital role in helping to establish CCRIF as a self-sustaining organization. In addition, the CDB has an important role in CCRIF's governance structure, as it nominates two Directors to CCRIF's Board of Directors. Thus, the CDB's input to the ICR will be valuable. Please feel free to comment candidly on any aspect of the attached ICR. We would particularly appreciate your views on CCRIF's relevance to sustainable development in the region and the value that it has added to the Caribbean countries' disaster risk management strategies.

Could I ask you kindly to reply by June 12?

Once again, let me say how much we will appreciate your perspective.

Todd

(See attached file: CCRIF ICR - 120529.pdf)

Todd Crawford
Operations Advisor
Sustainable Development Department
Latin America and Caribbean Region
The World Bank
1818 H Street, NW
Washington, DC 20433
Tel: 202-458-0112

Comments from Caribbean Institute for Meteorology and Hydrology

From: dfarrell@cimh.edu.bb
To: tcrawford@worldbank.org
Date: 06/12/2012 10:31 PM
Subject: Re: Caribbean Catastrophe Risk Insurance Facility -- World Bank
Implementation Completion and Results Report

Dear Mr. Crawford

Thanks for not complaining about the lateness of response. The following are my comments on the document:

1. There are a number of typos and stylistic changes that could be made to improve some aspects of the document. I assume most of these will be fixed before the document becomes final.
2. You frequently make reference to "national meteorological institutes" in the document. Such entities don't exist. I believe you are referring to "National Meteorological and Hydrological Services (NMHSs)". Please note that the CIMH is not a NMHS. It is an Institution of CARICOM. There are a number of such designated institutions.
3. You refer to CCRIF's interactions with Institutions of the CARICOM such as CIMH, CCCCC and OECS among others but you never provide examples of these interactions and how they shaped important products and services delivered to the region. I believe that providing such examples will emphasize the value and importance of such partnerships and may encourage further collaborations and cooperation. I don't recall seeing the number of MoU's CCRIF has with regional institutions. Again quantifying this number is important. On page 14, paragraph 31, the reference to meteorological institutes may be CIMH.
4. On page 8, paragraph 20, you note that the CCRIF benefited from the experiences of the CIMH. Can this be confirmed? It is not clear to me that CIMH was involved in the design phase of the project to establish CCRIF. I am aware that many NMHSs in the Caribbean region were not aware of the CCRIF and its wind product until after the product was established.
5. On page 20, paragraph 50 states that countries " ... were able to mount their initial high priority recovery efforts more quickly that would have been possible without the payouts." Can this actually be verified given the first and second sentences of paragraph 51?

I hope you find these comments fair and useful.

David Farrell

From: Todd W. Crawford/Person/World Bank
To: dfarrell@cimh.edu.bb
Date: 05/29/2012 03:02 PM
Subject: Fw: Caribbean Catastrophe Risk Insurance Facility -- World Bank
Implementation Completion and Results Report
458-0112 LCSHE

Dear Dr. Farrell,

The World Bank prepares an Implementation Completion and Results Report (ICR) for each project that it supports once the financing for that project has been completed. The multi-donor trust fund which was created in 2007 in order to establish the Caribbean Catastrophe Risk Insurance Facility and support its initial operations has been fully disbursed and CCRIF is now operating without donor support. As the administrator of the multi-donor trust fund and a contributor to it, the Bank has now prepared an ICR for the project. The ICR reviews the preparation of the project and developments during its implementation. It assesses the Bank's performance during project preparation and its implementation and also the performance of the executing agency -- in this case, CCRIF - - during project implementation. The ICR documents the results achieved and how those compare with the expected results. It also aims to synthesize the knowledge gained from the project and the lessons that can be learned from its design and implementation with a view to benefiting similar projects in the future.

The views of stakeholders greatly enrich an ICR. As one of premier Caribbean institutions with which CCRIF has a collaborative relationship, the views of the Caribbean Institute for Meteorology and Hydrology will be especially valuable. To that end, I would like to share with you for your review the ICR as it currently stands. Please feel free to comment candidly on any aspect. We would particularly appreciate your views on CCRIF's relevance to sustainable development in the region and the value that it can bring to the work of CIMH in helping countries in the region to strengthen their disaster risk management capacity.

Could I ask you kindly to reply by June 12?

Once again, let me say how much we will appreciate your perspective.

Best regards,

Todd Crawford



Operations Advisor
Sustainable Development Department
Latin America and Caribbean Region
The World Bank
1818 H Street, NW
Washington, DC 20433 - Tel: 202-458-0112

Annex 9. List of Supporting Documents

- “A Review of CCRIF’s Operation After Its First Season”; World Bank, December 1, 2008.
- “A Review of CCRIF’s Operation After Its Second Season”; World Bank, April 2010.
- “Reducing Financial Vulnerability to Natural Disasters in the Caribbean: A Review of CCRIF’s Operation After Its Third Season”; World Bank, April 2011.

CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY



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