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THE CARIBBEAN CATASTROPHE RISK INSURANCE INITIATIVE

A Review of CCRIF's Operation After Its Second Season

April 2010



THE WORLD BANK

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Executive Summary

This report provides an external assessment of the operations of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) during its second policy year—from June 1, 2008 to May 31, 2009. CCRIF is the world’s first facility of its kind—an independent, non-profit legal entity domiciled in the Cayman Islands. Operating as a joint reserve mechanism, its objective is to pool catastrophe risks and offer the Members and Associate Members of the Caribbean Community (CARICOM) insurance that provides a rapid infusion of liquidity in the event of a major hurricane or earthquake that exceeds a pre-agreed level of impact as measured using hazard parameters as a proxy for incurred losses.

Developed at CARICOM’s request following the devastation wrought on Grenada and the Cayman Islands by Hurricane Ivan in 2004, CCRIF was established in May 2007. The World Bank and a number of donors contributed to CCRIF’s start-up capital and also underwrote a portion of some members’ initial participation fees and premium payments during CCRIF’s first three policy years. A Multi-donor Trust Fund continues to reimburse CCRIF for certain eligible expenditures, thus facilitating continued growth of CCRIF’s reserves and risk-bearing capacity.

The report is intended primarily for the Facility’s Board of Directors, but it is hoped that it will also be informative and useful to the participating countries, donors, and other stakeholders. Further, the report aims to contribute to on-going discussions within the broader disaster risk management community about the possibilities for scaling up the role of CCRIF in the Caribbean and replicating or adapting CCRIF’s innovative model of *ex ante* disaster risk financing in other disaster-prone regions of the world.

CCRIF’s second year of operations was highly successful, as was its first. All 16 participating countries and territories renewed their policies (and did so again for CCRIF’s third policy year, beginning June 1, 2009). CCRIF paid out \$6.3 million to Turks and Caicos Islands in the aftermath of Hurricane Ike in September 2008 to help it maintain essential government operations and begin recovery. The Board approved in February 2009 a Strategic Plan for 2009–2012. Aided by a second season of relatively

modest pay-outs, CCRIF's reserves continued to grow, strengthening its risk-bearing capacity. CCRIF passed part of the benefit of this greater capacity to its members in the form of a lower premium rate, which enabled them to increase their coverage while paying the same premium amount. CCRIF continued its work to refine the disaster risk model that underpins its policies and to develop new forms of coverage, including a possible excess rainfall policy and coverage for members of CARILEC, the association of Caribbean electrical utility companies. The Board worked to strengthen the Facility's governance through amendments to its Operations Manual. CCRIF also enhanced its outreach to other Caribbean institutions that play a key role in disaster risk assessment and management in the region.

CCRIF faces a number of challenges going forward. Foremost among these is to complete the Board transition that was one of the main recommendations of the review of CCRIF's first year of operations.¹ This transition will serve to anchor CCRIF even more firmly in the pool of important Caribbean institutions. Concerted efforts to develop a closer relationship with CARICOM will be important in this regard.

Rolling out the second-generation loss model, the anticipated excess rainfall coverage and, possibly, hurricane loss coverage for members of CARILEC will require intensive interactions with CCRIF's members, reinsurance markets, key partner institutions, and the media to ensure a common understanding of the model and the features, inherent basis risk, and benefits of the policies. Among the messages to convey during these interactions is one that CCRIF has been consistently conveying but which continues to bear repetition, i.e. that the rapid injections of liquidity that CCRIF provides in the wake of a disaster are aimed at helping CCRIF's members to maintain crucial government operations and jump-start their recovery; the payouts cannot substitute for a comprehensive disaster risk management plan and governmental capacity to implement it.

Maintaining the right balance between CCRIF's financial stability and the price and scope of its coverage will call for the Board's on-going attention. As CCRIF's reserves have grown, the Board has steadily lowered the premium rate and widened the range of risks that its members can insure. Striking the right balance, taking into consideration CCRIF's claims history and its risk bearing capacity, is important to maintaining members' perceptions of CCRIF's value-added, particularly at a time when some members are facing tight fiscal constraints due to the global economic and financial downturn and resorted to debt to pay their premiums for the 2009–2010 season. The Board is aware of this and is developing a financial strategy document to address this issue of balance, which it expects to finalize in the first quarter of 2010.

Increasing CCRIF's transparency is also vital to broadening understanding of CCRIF's governance structure, modeling, and policy coverage and consolidating CCRIF as a well-recognized and widely-valued Caribbean institution. A common theme that ran through most of the interviews conducted for this review was the desire for increased transparency. Procedures for appointing the Board, its operational policies, and the functioning of the risk model were highlighted in this regard. Other matters include the principles that the

1 "A Review of the CCRIF's Operation After its First Season," World Bank, December 1, 2008.

Board follows in setting its budget and determining the scope of its activities and those that guide its decisions about how to balance CCRIF's need for financial stability with its members' desire for affordable coverage. Stepped up outreach activities in the 2009–2010 season, with the Board's decision to hire a new communications firm, have begun to address this matter.

Main Recommendations

The principal recommendations arising from this review for the Board's action and consideration are as follows:

- ***Governance:*** Redouble efforts to complete the Board transition to a membership constituted in accordance with CCRIF's Trust Deed, as recommended by the review of CCRIF's first year of operations. This will require a closer working relationship with CARICOM, which will also serve to consolidate perceptions and the reality of CCRIF as a Caribbean institution.
- ***Engagement with Members:*** Enhance direct communication and interaction between CCRIF and a wider range of its members' officials, including those from their disaster risk management agencies and meteorological institutes, as well as the decision-makers in the Ministries of Finance and Planning. Matters around which this engagement should center include procedures for appointing the Board, the objectives of CCRIF's newly-created technical cooperation budget, the functioning and implications of the forthcoming second-generation loss model, the parametric nature of CCRIF's coverage, including for any new perils, the basis risk inherent in CCRIF's coverage, and the role that CCRIF coverage can play in a broader disaster risk management plan. CCRIF's continued efforts, building on those efforts to date, to promote greater understanding of these matters would serve to maintain and increase member participation.
- ***Transparency:*** Articulate and publish for consultation with CCRIF's members key principles and strategies regarding its operational, R&D, and technical cooperation budgets; reserves accumulation; and the stability or variability of premium rates and levels and how those factors may be affected by CCRIF's claims history or the reinsurance cycle. Consider making minutes of the Board of Directors meetings publically available, also to enhance CCRIF's transparency.
- ***Independent Actuarial and Technical Audits:*** Commission a periodic Statement of Actuarial Opinion on CCRIF's solvency position and an independent annual or biannual actuarial report on its risk management strategy. Commission from time to time as needed independent technical audits of the loss model and existing and new products. Such audits would serve to strengthen further the Board's oversight of relevant risk management strategies and operational functions and enhance market acceptability of its products with potential benefit to CCRIF's reinsurance costs.
- ***Reinsurance and Pricing:*** Consider whether CCRIF's reserves are now at a level that would support higher risk retention and/or a further reduction in the premium rate.

Assist members to think through how best to benefit from changes in the premium rate, whether by increasing their coverage and holding their premium amount constant or by maintaining the level of coverage and reducing their premium payment.

- ***Investment Management:*** Consider readjusting CCRIF's investment strategy to match asset and liability maturities better and facilitate investing in somewhat less liquid assets that could give a higher return.
- ***Innovation:*** Consider employing a professional technical writer on a short-term contract to work with the Facility Supervisor, Reinsurance Broker, and others to develop materials for broad distribution to member country officials, partner institutions, donors, and other relevant stakeholders to articulate the differences between the first- and second-generation loss models and explain the excess rainfall product; and undertaking broader elicitation of research institutions for the development of any further new products.

1. Introduction

This report on the Caribbean Catastrophe Risk Insurance Facility (CCRIF) reviews the Facility's second season of operations—from June 1, 2008, to May 31, 2009.² The CCRIF was established in May 2007 as an independent, non-profit legal entity to pool catastrophe risks and provide Members and Associate Members of the Caribbean Community (CARICOM) with rapid access to an infusion of liquidity in the event of a major hurricane or earthquake meeting specific parameters of speed, location, and intensity.³ CCRIF is the world's first facility of its kind. It is controlled by a five-person Board of Directors, which consists of one representative of CARICOM, one representative of the donors that have contributed to the Multi-donor Trust Fund that supports the Facility,⁴ one financial and one insurance technical expert, and an Executive Chairman appointed by the four.

The report provides an external assessment of CCRIF's operations and its challenges and opportunities going forward. It is intended primarily for the Facility's Board of Directors. It is hoped that it will also be informative and useful to the participating countries, donors, and other stakeholders. The report also aims to contribute to on-going discussions with the broader disaster risk management community about the possibilities for scaling up the CCRIF's role in the Caribbean and replicating or adapting CCRIF's innovative model of *ex ante* disaster risk financing in other disaster-prone regions of the world.

² This report builds on "A Review of the CCRIF's Operation After its First Season"; World Bank, December 1, 2008.

³ The 16 countries and territories are: Anguilla, Antigua and Barbuda, the Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and the Turks and Caicos Islands.

⁴ Bermuda, Canada, France, Ireland, the United Kingdom, the Caribbean Development Bank (CDB), the European Union (EU), and the World Bank have contributed approximately \$67.4 million to a Multi-donor Trust Fund to support CCRIF's initial capital and operating costs.

The review was carried out between August and November 2009 by a multi-disciplinary team.⁵ Based on a document review and an independent assessment of CCRIF's disaster risk assessment models, reinsurance strategy, and asset management policy, the report also benefited from the team's interviews with members of the Facility's Board of Directors, representatives of its Facility Supervisor, Insurance Manager, Asset Manager, and Reinsurance Broker, as well as with member country officials, collaborating organizations, and other disaster risk management experts. The team wishes to thank all those who generously gave their time to help arrange these meetings and share their insights so as to contribute to the review. These persons are identified more specifically in Annex B.

⁵ The team consisted of Todd Crawford, a consultant with prior experience in World Bank operations, Rolande Pryce, a World Bank lawyer who is the Bank's Country Officer for the Organization of Eastern Caribbean States (OECS), Jon Palin, a qualified actuary with significant experience in financial risk management, and Andrew Mitchell, a qualified expert with substantial experience in reinsurance and disaster risk modeling.

2. Background on CCRIF

2.1 Establishment

CCRIF was established in 2007 to provide a financial solution to the short-term liquidity needs of Caribbean governments in the aftermath of major hurricanes and earthquakes. It is the result of two years of work, undertaken following the disastrous 2004 hurricane season at the request of the CARICOM Heads of Government for World Bank assistance in improving access to catastrophe insurance. The work entailed close collaboration among the region's governments, CARICOM, the Caribbean Development Bank (CDB) and other key donor partners, the World Bank, and external experts. This work was funded by a grant from the Government of Japan and the World Bank's own resources. Grants from a number of other bilateral donors were also essential to CCRIF's start-up.

2.2 Key Characteristics

CCRIF is a joint reserve mechanism, or mutual insurance company, through which participating governments can obtain coverage akin to business interruption insurance that gives them access to a rapid financial payout in the wake of severe hurricanes and earthquakes. The speed of CCRIF's claims settlement, which is essential to its business model, is made possible by the use of parametric insurance triggers derived from the catastrophe risk models designed during CCRIF's development phase (see Box 2.2). Coverage is capped at 50 percent of total estimated direct losses above a deductible, a proportion believed to be sufficient to fulfill CCRIF's objective of meeting participants' immediate liquidity needs until other sources of funds can be mobilized for their longer-term relief and reconstruction.

Box 2.2: Catastrophe Risk Models

Parametric insurance policies are based on catastrophe risk models consisting of five modules that combine to produce a picture of: (i) hazard parameters for each peril (in CCRIF's case, tropical cyclones and earthquakes) at specific locations; (ii) the value of assets at risk at those locations; (iii) the damage to those assets associated with specific perils of specific intensity; (iv) the monetary losses associated with such perils at specific locations; and (v) the losses arising from the distribution of damage.

Hazard module: The hazard module defines the frequency and severity of a peril, at a specific location. This is done by analyzing the historical event frequencies and reviewing scientific studies performed on the severity and frequencies in the region of interest. Once the hazard parameters for each peril are established, simulated stochastic event sets are generated that define the frequency and severity of millions of simulated cyclone or flooding events. This module can analyze the intensity at a location once an event in the simulated set has occurred. This module models the attenuation/degradation of the event from its location to the site under consideration and evaluates the propensity of local site conditions either to amplify or to reduce the impact.

Exposure module: The exposure values of "assets at risk" are estimated either from available secondary data sources or are derived from the distribution of population. This "proxy" approach is used when the preferred specific site-by-site data are not available. Based on these data, the module computes the value for all types of exposures as a product of multiplication of the area of total building inventory and the average replacement cost per unit of inventory.

Vulnerability module: The module quantifies the damage caused to each asset class by the intensity of a given event at a site. The development of asset classification is based on a combination of factors, which are construction material, construction type (say, wall and roof composition), building usage, number of stories, and age. Estimation of damage is measured in terms of a mean damage ratio (MDR). The MDR is defined as the ratio of the repair cost divided by replacement cost of the structure. The curve that relates the MDR to the disaster (earthquake or hurricane) intensity is called a vulnerability function. Each asset class and building type will have its own vulnerability curve for each peril.

Damage module: To calculate losses, the damage ratio derived in the vulnerability module is translated into a dollar loss by multiplying the damage ratio by the value at risk. This is done for each asset class at each location. Losses are then aggregated as required. Government assets or assets that are likely to be financed with government resources can be easily isolated and an assessment of financial needs for reconstruction calculated. Based on the likely timing for reconstruction, these costs can be ventilated between short-, medium-, and long-term financial needs.

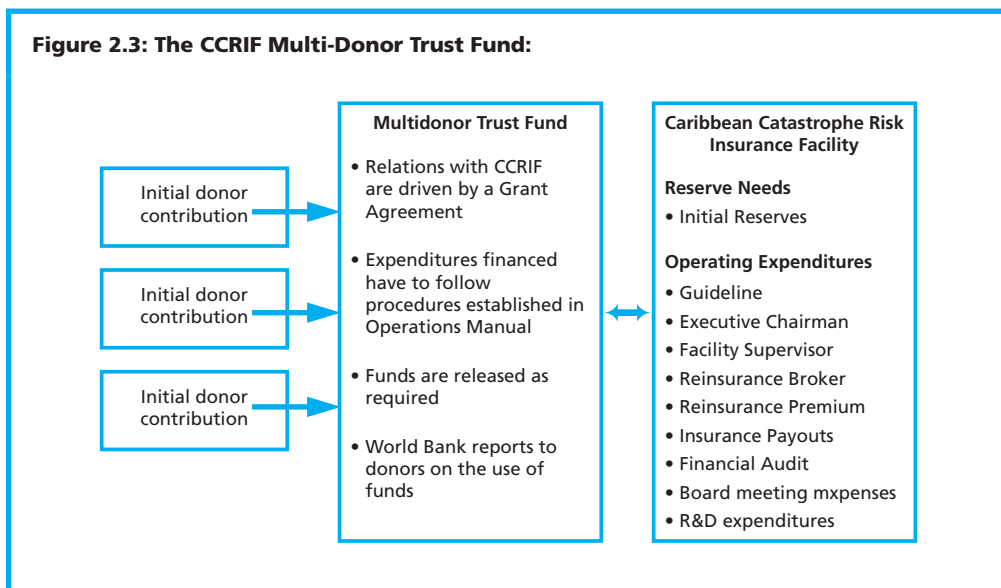
Loss module: The module estimates the losses from the damage distribution. When dealing with government losses, this module estimates relief and recovery costs and tax revenue losses.

2.3 Reserves and Pricing

CCRIF's liquidity is competitively priced, reflecting its nature as a mutual insurance company or joint reserve mechanism. Countries' annual contributions ("premium") are set at a level that covers expected losses and operating costs, including reinsurance costs, and allows for net reserve growth. CCRIF's reserve assets and its role as a risk aggregator are essential to the low cost of its insurance to its members, as is its not-for-profit status and mission.

CCRIF's strong reserve base allows it to retain some of the risk transferred by participating governments. This helps to lower its costs. The stronger CCRIF's reserves, the less reinsurance it needs to purchase in traditional reinsurance markets or finance in capital markets in order to secure enough capital to assure full payment of claims after a major disaster.⁶ In addition, as CCRIF's reserve base grows and it retains more risk, it is able to smooth the cost of risk transfer, which is highly variable and cyclical in the commercial reinsurance market, and provide the benefit to its members of greater premium stability.

Donor funds held by the World Bank in a Multi-Donor Trust Fund (MDTF) have helped CCRIF to build its reserves. Bermuda, Canada, France, Ireland, the United Kingdom, the Caribbean Development Bank, the European Union and IBRD have contributed approximately \$67.4 million to the MDTF. These funds cover some of CCRIF's operating expenses, including contracts with service providers that are approved for reimbursement, the cost of reinsurance, and insurance payouts. These reimbursements have helped CCRIF use a larger share of its members' contributions to help build its own reserves and thereby to reduce its need for expenditures on reinsurance (see Figure 2.3).



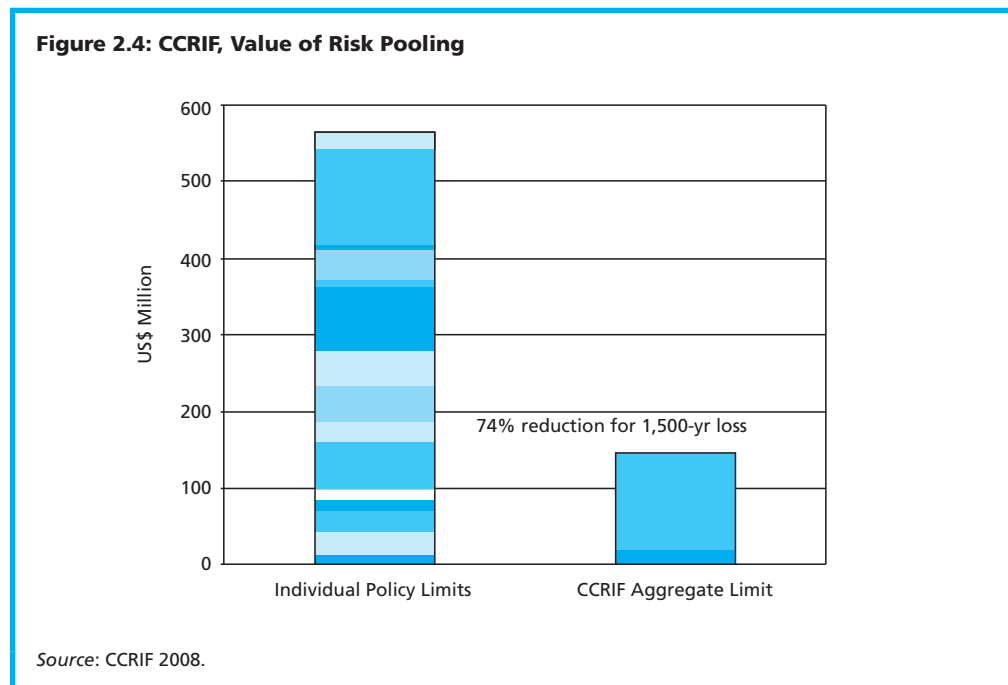
2.4 Risk Pooling and Pricing

CCRIF's role as a risk aggregator is also essential to the low cost of its coverage by allowing its members to pool their individual risks into one, better-diversified portfolio.

⁶ It is important to note, however, that, as discussed elsewhere in this report, CCRIF would face the risk of insolvency in the case of events or a series of events with an extremely low statistical probability of occurring.

The cost of catastrophe insurance depends to a significant degree on the variability of the risks that are being insured. As it is very unlikely that all Caribbean islands would be hit by major hurricanes or earthquakes in any given year, pooling country-specific risks within a regional portfolio generates risk diversification benefits that reduce the aggregate cost of coverage to less than the sum of individual costs of coverage. In the case of the CCRIF, pooling country-specific risks is estimated to reduce the cost of individual insurance premiums by almost half of the cost of coverage an individual government would have to pay if it approached the reinsurance market independently.

Figure 2.4 illustrates the benefits of risk pooling. It compares the sum of the individual policy limits and the CCRIF aggregate limit under CCRIF's 2008–09 insurance portfolio. The comparison shows that the CCRIF aggregate limit, which is estimated to sustain a 1-in-1,500-year event, is 74 percent lower than the sum of individual policy limits.



2.5 Policy Terms, Conditions, and Pricing

CCRIF offers flexible terms and conditions that allow its members to tailor the coverage to their own catastrophe risk financing strategy. CCRIF members decide whether to obtain coverage for earthquakes, tropical cyclones, or both, and to determine the frequency and severity of the perils they wish to cover. In doing so, they factor in a number of considerations, including the premium they wish to pay, their access to other domestic or external sources of finance in the event of a disaster, and the speed with which they could access this finance following the disaster.

Policies are priced individually according to the characteristics of the coverage that each participating government chooses. Once the country has decided on the kind of coverage to purchase, the CCRIF model is used to calculate the average annual loss (AAL). The premium is set as a multiple of the AAL, in order to cover the combined cost of AAL, CCRIF's operating costs, and its needs for reserve growth in line with its reinsurance strategy. From the first to the second seasons, CCRIF reduced this premium rate by 10 percent.

2.6 Coverage and Payouts

Participating countries decide on the parameters of their coverage. These are described below, and the payout that might result from those choices is illustrated in Table 2.6. The procedure is broadly similar for earthquakes and tropical cyclones. For the sake of simplicity, this example only looks at tropical cyclones (hurricanes).⁷ Hurricane policies are based on a formula that takes as inputs the speed and location of a cyclone and estimates the likely damage caused to assets in the cyclone's path using the catastrophe risk methodology outlined in Box 2.2. The formula is based on scientific research, using historical tropical cyclone data and available information regarding assets.

The policyholder needs to make three decisions:

- **The severity of the event that gives rise to a payment. This is called the “attachment point”.** Under the CCRIF's current policy parameters, this cannot be more frequent than a 1-in-15 year event, that is, an event of such catastrophic proportions that it is statistically unlikely to occur more frequently than one in fifteen years. For the 2009–2010 season, CCRIF members have chosen attachment points between 1-in-15 and 1-in-50 years. The example below is based on an attachment point of 1-in-30 years.
- **The severity of the event above and beyond which the maximum payment is triggered. This is called the “exhaustion point”.** For the 2009–2010 season, CCRIF members have chosen exhaustion points between 1-in-75 and 1-in-180 years. The example below is based on an exhaustion point of 1-in-125 years.
- **The dollar amount of the maximum payment. This is called the “coverage limit”.** This will depend on the size and assets of the country. For the 2009–2010 season, CCRIF members have chosen coverage limits between approximately \$1m and \$104m. The example below has a coverage limit of \$26.0 million.

A payout would depend on the cyclone's wind speed, path, and proximity to the country and on the attachment and exhaustion points and coverage limit that the country had chosen. The payout increases as the wind speed increases and as the distance between

⁷ The terms “tropical cyclone” and “hurricane” are used interchangeably in this report.

the eye of the storm and the point(s) of measurement diminishes. Table 2.6 illustrates the payout for a hypothetical country following a hypothetical hurricane, calculated using the formula that incorporates these variables.⁸ Each cell in the table shows the payout amount for a tropical cyclone of a particular wind speed and location. The “staircase” lines divide the payments into three bands:

- If the cyclone is relatively mild and would occur more commonly than the attachment point, no payment would be made. Such events are in the blue band of the table. For

Table 2.6: Hypothetical Payouts
(US \$ millions)

Wind speed (km/h)	Distance (km)											
	0	10	20	30	40	50	60	70	80	90	100	
300	26.0	26.0	26.0	26.0	26.0	23.8	10.7	4.2	0.9	0.0	0.0	
275	26.0	26.0	26.0	26.0	26.0	16.6	6.8	2.1	0.0	0.0	0.0	
250	26.0	26.0	26.0	26.0	24.9	10.7	3.7	0.9	0.0	0.0	0.0	
225	26.0	26.0	26.0	26.0	16.0	6.1	1.4	0.0	0.0	0.0	0.0	
200	26.0	26.0	26.0	20.6	9.1	2.6	0.0	0.0	0.0	0.0	0.0	
175	14.9	14.9	14.9	11.1	4.0	0.9	0.0	0.0	0.0	0.0	0.0	
150	6.6	6.6	6.6	4.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	
125	1.3	1.3	1.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

⁸ The calculations are for illustrative purposes only and do not replace the formal claims procedure. They are based on an actual policy for the 2009–2010 season, but make some simplifications regarding the precise locations of the measuring points and the direction and speed of the progress of the cyclone. The numbers are approximate. They assume only one measurement point and a tropical cyclone that passes from due-east to due-west at a speed of 12 knots.

example, a wind speed of 100km/h at any distance is a more common occurrence than the selected attachment point of 1-in-30 years in this example and would not give rise to a payment.

- **If the severity of the cyclone falls between the selected attachment and exhaustion points**, the payment would be between the premium amount and the coverage limit, depending on its severity. These events are in the light blue band. For example, a wind speed of 200 km/h at a distance of 40 km has a rarity between 1-in-30 and 1-in-125 years and would give rise to a payment of \$9.1 million, i.e., less than the coverage limit.
- **If the cyclone is very severe and would occur more rarely than the exhaustion point**, the coverage limit would be paid. Such events are in the gray band. For example, a wind speed of 250km/h directly overhead, or a wind speed of 300 km/h that is 20km away are both rarer than the exhaustion point (1-in-125 year event) and either of these would give rise to the maximum payment of \$26.0 million.

3. Review of the 2008–2009 Season

3.1 Overview

CCRIF's second, 2008–2009, season began on June 1, 2008, the first day of the 2008 Atlantic Basin Hurricane Season. For the second season, the 16 participating CARICOM countries and territories renewed a total of 30 hurricane and earthquake policies, benefiting in doing so from improved terms. The policies produced premium income to CCRIF of approximately \$21.8 million. CCRIF made a single payout during the season of \$6.3 million to the Turks and Caicos Islands after Hurricane Ike struck the Islands. CCRIF's financial stability is solid, supported not only by its retained earnings but also by donor contributions from the MDTF managed by the World Bank. During the year, among important actions, the Board of Directors adopted a strategic plan; commissioned work to develop a second-generation loss model and to explore the feasibility of new products; decided to bring on board a new communications firm to enhance CCRIF's outreach; and strengthened CCRIF's relations with partner institutions in the region.

3.2. Insurable Events and Payouts

During the season, there were 16 named storms, much more than the long-term average and making the season the fourth most severe on record. Nonetheless, although eight of the storms were of hurricane strength and five were major hurricanes, only the intensity and path⁹ of Hurricane Ike in early September 2008 combined to produce an index value

⁹ The path, i.e., distance from the territory of the CCRIF members, is determined relative to a certain number of calculation locations, which varies from member to member depending in large part on the extent of their territory. The population and government exposure, i.e., buildings and other physical assets in the vicinity of the calculation locations, are also factors determining the index value.

high enough to trigger a CCRIF member's policy and result in a payout. The reason for this is that despite the intensity of the other storms, their path did not take them close enough to the territory of any other CCRIF members to trigger any of their respective policies.

The Turks and Caicos Islands received the payout relating to Hurricane Ike. The index value for the Turks and Caicos Islands represented a loss to the Government with a return period of around 46 years (based on CCRIF's loss curves), estimated at \$51 million. Factoring in the terms and conditions of coverage that the TCI Government had selected, the payout was \$6.3 million. Made within three weeks of Ike's striking the Turks and Caicos Islands, the payout provided a rapid injection of liquidity to assist the Government with its near-term financial needs, thus serving the objectives for which CCRIF had been established.

Hurricane Ike's path did not result in other payouts, although it passed directly over Great Inagua Island, the southernmost populated island of the Bahamas, then swept 125 km north of Haiti, and came within 230 km of Cayman Brac and Little Cayman. While two out of twenty calculation locations in the Bahamas recorded very high winds, their weighting in the model for the Bahamas was low, due to the relatively small population and value of government assets in the vicinity of those calculation locations. As a result, the aggregate calculated index value was well below the threshold for a payout. For similar reasons, the calculated index values for Haiti and the Cayman Islands were zero.¹⁰

There were 15 earthquake events during the season, including one of a 7.3 magnitude on the Richter Scale off the northern coast of Honduras. This latter was felt as far away as the Cayman Islands, Cuba, and Jamaica to the north and northeast, and throughout much of Central America and Colombia to the south. Despite this earthquake's magnitude and reach, Belize was the sole CCRIF member for which CCRIF's parametric models calculated an index value greater than zero, i.e., estimated that some damage and losses would occur. Nonetheless, as the index value was below the attachment point, or deductible, of Belize's earthquake policy, the event did not trigger a payout.

3.3 Policy Renewals

In renewing their hurricane and earthquake policies for the 2008–2009 season, all 16 CCRIF members benefited from improved terms for the season that Board of Directors had previously approved. These improvements included:

- *a reduction in the available attachment point*, i.e., the point at which the coverage kicks in, for hurricanes from 1 in 20 year events to 1 in 15 year events;

¹⁰ CCRIF uses data from independent sources (the National Oceanic and Atmospheric Administration, NOAA, and the United States Geological Survey, USGS) to calculate the index values. An independent third party, currently CCRIF's external auditor, verifies CCRIF's calculations.

- *an increase in the available maximum coverage amount* for each covered peril from \$50 million to \$100 million;
- *a reduction of the overall premium rate* by 10 percent, a reduction which 15 of the members leveraged to increase their coverage rather than lower their premium payment; and
- *an increase in the minimum payout per event* to the amount of the member's annual premium.

By the end of the 2008–2009 policy year, all CCRIF members had renewed policies for the 2009–2010 season, but a number of CCRIF members needed to make special financial arrangements to pay their 2009–2010 premiums. Given their unusually tight fiscal constraints stemming from the global economic downturn, Anguilla, Antigua and Barbuda, St. Kitts and Nevis, and Turks and Caicos Islands arranged to borrow from the CDB to pay their premiums. Dominica and Grenada, which benefited from the final year of IDA support to pay half of their premiums, arranged to borrow from the CDB to pay the balance. Haiti also received funding from IDA for half of its premium and accepted the Canadian International Development Agency's (CIDA) offer of a grant to pay the balance. Due to the time required to finalize these arrangements, the Board of Directors granted these CCRIF members several extensions for making the payments.¹¹ St. Lucia, which also benefited from the final year of IDA support, paid the second half of its premiums from its own resources, but arranged to borrow from the CDB to reimburse itself for that half.

During The Bahamas' discussions with CCRIF regarding renewal of its hurricane policy for the 2009–2010 season, it requested that CCRIF investigate modification of its policy by splitting its territory into three zones and permitting each of the zones to be insured independently. The reason for The Bahamas' request was that its 700 islands (of which only 30 are inhabited) are spread over 5,358 sq. miles (13,878 sq. km) and, thus, experience different weather patterns. Under the conditions of CCRIF's first-generation loss model, loss generation is heavily weighted towards Nassau (where most of the economic activity occurs) such that a hurricane or earthquake that did not directly impact Nassau would be unlikely to trigger a payout as was the case with Hurricane Ike. Dividing The Bahamas' territory into zones would better accommodate its unique geographic characteristics by allowing it to vary the attachment points for each zone depending on the level of risk it determines that the specific zone has. CCRIF's existing model would not easily permit this degree of differentiation due to its proprietary nature. Although CCRIF offered to modify the Bahamas' policy for the 2009/2010 season within the limits of the existing model, The Bahamas opted to wait for the new, second-generation model to become operational—which is expected for the 2010–2011 policy year—to modify its policy.

¹¹ The last outstanding premium payment was received in early December 2009.

3.4 CCRIF's Financial Stability

CCRIF's financial stability is solid, despite the global financial crisis. Given its reserves and reinsurance coverage, CCRIF entered the 2009–2010 policy year with sufficient claims paying capacity—including available donor resources, its own reserves, and its reinsurance—to withstand a series of losses with less than a 1 in 10,000 year chance of occurring. With the issuance of the 2008–2009 policies, CCRIF's aggregate exposure (or total sum insured) stood at approximately \$560 million. Of this risk, CCRIF retained \$12.5 million and laid off \$132.5 million in the traditional reinsurance market and in a swap intermediated by the World Bank in the capital market. In theory, CCRIF bore all risk in excess of \$145 million, but its actual ability to pay claims in excess of \$145 million was limited by its reserves plus the amount remaining undisbursed and uncommitted in the CCRIF Grant Agreement and in the MDTF. As of end-May 2009, CCRIF's assets—obtained from donor contributions, members' participation fees, accumulated investment income, and retained earnings from premium payments for the 2008–2009 season—totaled \$78.6 million.¹² The amount potentially available in the CCRIF Grant Agreement and in the MDTF totaled approximately \$49 million.¹³ Thus, availing itself of reinsurance, the balances in its Grant Agreement and in the MDTF, and its reserves, CCRIF would have been able to pay claims up to a maximum of approximately \$260 million.¹⁴ Claims arising from the remainder of its \$560 million in exposure, while highly unlikely statistically, would have resulted in insolvency. These matters are reviewed and assessed further in Chapter 5.

3.5 Multi-Donor Trust Fund

During the 2008–2009 season, the European Union made a generous contribution to the MDTF of €12.5 million, or approximately \$17 million, bringing total contributions to the MDTF to approximately \$67.4 million as of end-May 2009. Net investment income accruing to the balance held in the MDTF¹⁵ had added nearly \$3 million to this amount as of that date. From the MDTF, \$50 million has been committed to CCRIF under its Grant Agreement, of which \$20.7 million had been disbursed to CCRIF as of end-May 2009. Thus, \$49.7 million remained available to CCRIF as of that date, consisting of: \$29.3 million committed but not yet disbursed under the CCRIF Grant Agreement, plus approximately \$20.4 million not yet committed from the MDTF to CCRIF.

The MDTF has contributed significantly to CCRIF's financial stability and will continue to support it until exhausted. The \$49.7 million balance as of end-May remained available to reimburse claims paid by CCRIF and cover its eligible operational

12 Income on CCRIF's investments totaled \$2.6 million for the year ending May 31, 2009, reflecting CCRIF's sound investment guidelines and the efficacy of the asset manager's performance.

13 See Section 3.5.

14 This amount would be reduced to the extent that CCRIF's liabilities, e.g., accounts payable, ranked equal to or higher than claims payments under the Cayman Islands' insolvency law.

15 Investment income net of administrative charges.

expenses, including approved contracts with service providers, research and development expenditures for new product development, reinsurance costs, policy payouts not covered by reinsurance, and certain other costs.

3.6 Developments and Important Board Decisions in 2008–2009

The Board adopted a Strategic Plan for the policy years 2009–2010 through 2011–2012. Key elements address communications, operational efficiency and internal controls, new product development, pricing and financial stability, and stakeholder communications. Under the Board's general direction, a number of actions are under way pursuant to this plan, some of which address recommendations made in the review of CCRIF's first operational season.¹⁶

The Insurance Manager continued work to refine the Operations Manual. Specific issues being clarified included: (i) arrangements for tendering for and contracting with the various service providers engaged in the management and work of the Facility, including their roles, responsibilities, and term; (ii) rules of procedure for the Board, the nomination, compensation, and term of Directors, the selection, compensation, and term of the Executive Chairman, and the venue, quorum, and other matters pertaining to Board meetings; and (iii) internal controls, including arrangements for authorizing payments to contractors.

The Facility Supervisor, at the Board's direction, tendered for a new communications service provider. In doing so, CCRIF aims to improve understanding among policy holders as well as the general public of CCRIF and its specialized parametric insurance coverage, strengthen outreach to partner institutions and the broader disaster risk management community, and underscore the essential message that CCRIF insurance in and of itself is a complement to, rather than a substitute for, CCRIF members' own investments in disaster mitigation activities and financial provisions to deal with smaller, but more frequent, losses. The tendering process was completed in June 2009 with signature of a contract with Sustainability Managers (SM), a communications firm headquartered in Jamaica, and the Directors welcomed and approved the strategy that SM presented at the Board's September 2009 meeting.

The Facility Supervisor worked with Kinetic Analysis Corporation (KAC) and the reinsurance community to begin developing and testing a second-generation loss modeling framework to refine CCRIF's policies and their pricing going forward. The model is intended to replace the EQECAT first generation parametric model that CCRIF used for its policies during its first three seasons. The second-generation model incorporates recent scientific advances in hazard and loss modeling and is expected to be highly scalable and applicable at a wide range of modeling resolutions. This should enable tailoring CCRIF's hurricane and earthquake insurance coverage more closely its members' individual needs. An important outcome of greater customization should be

¹⁶ "A Review of the CCRIF's Operation After its First Season", World Bank, December 1, 2008.

the reduction of basis risk, which occurs when an insurance payout does not exactly match the actual loss. The second-generation model could also eventually facilitate lowering the attachment point on CCRIF's hurricane policies to one in ten year events, thus enhancing CCRIF's function as a joint reserve mechanism.

The Facility Supervisor also continued research funded by CCRIF to develop new products. These include: (i) an excess rainfall product, being modeled and tested by KAC and the Caribbean Institute for Meteorology and Hydrology (CIMH) and vetted with the reinsurance community; and (ii) a product to provide catastrophe coverage for power companies forming the CARILEC, which would be offered through a separate captive facility independent of CCRIF's current operations. While development of these products has been slower than expected, due to their complexity, the Board expects them to be available for the 2010–2011 policy year.

In other decisions and actions during the 2008–2009 policy year, CCRIF:

- Decided to reduce the premium rate again, by 11 percent, for the 2009–2010 insurance year.
- Re-tendered the contract for the Insurance Manager service provider;
- Established a budget for research and development, separate from its operational budget, recognizing the importance of refining the analytical underpinnings of its hurricane and earthquake policies, the potential benefits to the region of making these analytical tools available, and the value of developing innovative catastrophe insurance products for other perils, such as excess rainfall;
- Reviewed its risk management strategy and increased its retention from \$12.5 million to \$20 million for the third, 2009–2010 season;
- Negotiated a lower commission for the reinsurance broker;
- Signed Memoranda of Understanding (MOU) with CIMH, the Caribbean Disaster Emergency Response Agency (CDERA) and began discussions with the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) and the University of the West Indies (UWI) on MOUs for technical cooperation and possible technology transfer (to UWI);
- Continued to explore with UWI, the World Bank, and others CCRIF's possible involvement in agricultural risk management, either as a primary underwriter for index insurance or as a reinsurer; and

- Contributed as a co-sponsor, presenter, discussant, and/or technical resource at a number of regional and international conferences and discussions on parametric insurance, risk pooling, and hazard risk modeling and reduction.¹⁷

¹⁷ Listed at length in CCRIF's 2008–2009 Annual Report, these include: (i) the professional development session on Parametric Insurance and New Product Developments/Modeling at the annual Caribbean Conference on Disaster Management in Barbados, December 2008; (ii) the World Forum of Catastrophe Programs, Iceland, June 2008; (iii) the Natural Catastrophe Risk Insurance Mechanisms for Asia and the Pacific Conference, Tokyo, November 2008; (iv) the CARICOM Heads of Government meeting, Belize, March 2009; (v) a conference organized by the Pacific Islands Applied Geoscience Commission, Fiji, May 2009; (vi) a World Bank workshop on climate risk in agriculture, Mexico, October 2008; (vii) the CIMH Open Day in celebration of World Water Day and World Meteorological Day, Barbados, March 2009; (viii) a CDERA regional workshop, Development of the Regional Disaster Risk Management Strategy and Plan of Action and Standards for Conducting Hazard Mapping, Vulnerability Assessment and Economic Valuation for Risk Assessment for the Tourism Sector, Trinidad and Tobago, May 2009; (ix) the Chinese Insurance Regulatory Commission conference on risk pools, Beijing, October 2008; (x) an Insurance Institute of Barbados training event, November 2008; (xi) the Insurance Association of the Caribbean conference, Curacao, June 2008; and (xii) the Caribbean Constituency meeting at the World Bank/IMF Annual Meeting, Washington, DC, October 2008.

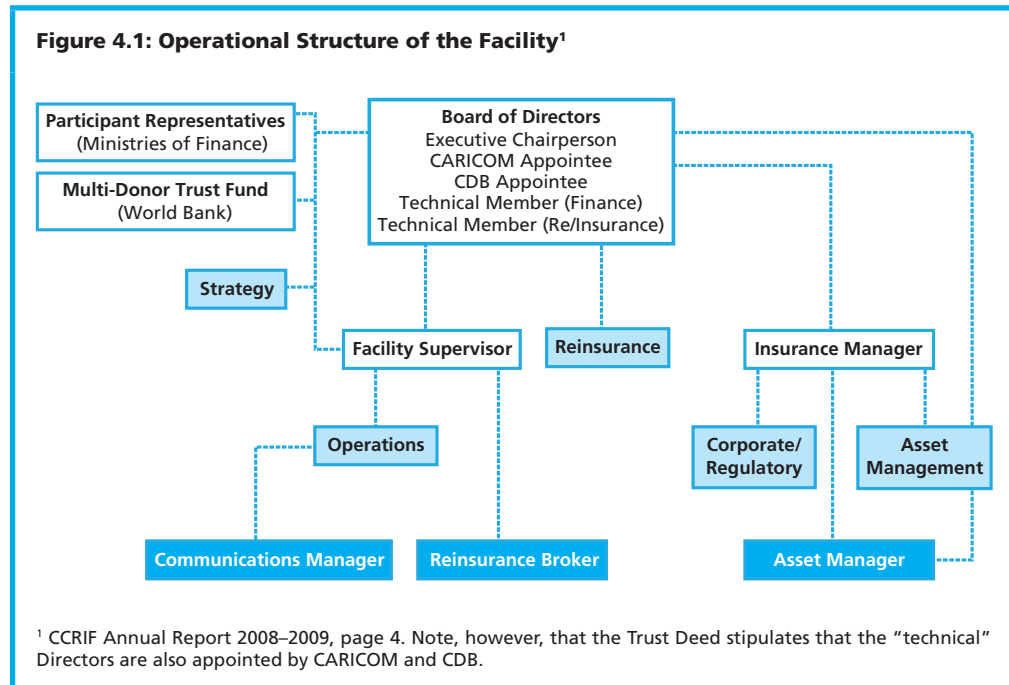
4. Operational Structure

4.1 Description

CCRIF has a lean operational structure. Its governing body is the Board of Directors, which is comprised of representatives of its members and the contributing donors. The Board of Directors is supported in its work by the Insurance Manager, who is responsible for advice on regulatory matters, financial reporting, and corporate secretarial functions, and by the Facility Supervisor, who is the principal technical advisor and responsible for the day to day operations of the Facility. CCRIF has no fulltime staff positions *per se*; all its service providers are on a term contract basis. The duties and responsibilities of each key actor in CCRIF and critical operations processes are delineated in the Operations Manual.

The *Board* is responsible for all strategic and critical operations decisions relating to CCRIF. The duties of the Board members are mandated under Cayman law and additional responsibilities are set out in CCRIF's Operations Manual. The Board is headed by an Executive Chairman who is appointed by the four other Board members. In summary, the duties of the Board include but are not limited to: (a) ensuring that CCRIF is operating within the mandate of the business plan as approved by the Cayman Islands Monetary Authority; (b) reviewing and approving the annual budget, any changes to the CCRIF Operations Manual, the annual risk transfer placement and financial structure, any changes to the coverage provided under the parametric insurance policy, any changes in the annual premiums charged to member countries, annual financial statements and annual audit results; (c) establishing investment guidelines; (d) selecting and overseeing the performance of the service providers; and (e) new forms of coverage for additional types of perils.

Under Cayman law, the *Insurance Manager* is responsible for providing insurance expertise to CCRIF, ensuring that CCRIF complies with its legal, accounting and regulatory obligations. The Insurance Manager's duties are mandated under Cayman



law and additional duties are delineated in the Operations Manual. The Insurance Manager is the Registered Agent and his office is the principal designated office of CCRIF. Additionally, the Insurance Manager is responsible for financial reporting and carries out corporate secretarial functions, including organizing and managing the Board’s meetings and recording and following up on decisions emanating from those meetings.

Sagicor Insurance Managers Limited (Sagicor) is currently performing the role of Insurance Manager for CCRIF. The Company was hired in March 2007. In March 2009, the contract was retendered. At the end of a competitive process in June 2009, Sagicor obtained a new three-year contract.

The *Facility Supervisor* is responsible for CCRIF’s day to day operations. The duties of the Facilities Supervisor include but are not limited to: (a) risk management, including monitoring the risk structure of CCRIF and advising the Board on risk transfer strategies; (b) financial planning; (c) participant interface, including participant policy/claims administration; (d) directing and overseeing the work to develop policies for additional types of perils; (e) overseeing the functions of the Reinsurance Broker, and the Corporate Communications Consultant; and (f) administering the fiduciary aspects of the MDTF administered by the World Bank. The Facility Supervisor’s duties are set out in the Operations Manual.

Caribbean Risk Managers Limited (CaribRM), a highly specialized firm (a member of the CGM Gallagher Group), was selected competitively during the design phase of CCRIF and since then has been performing the role of Facility Supervisor. CaribRM’s contract was renegotiated at the end of the 2007/08 season and again at

the end of the 2008/09 season to reflect its evolved role after the end of the second year of operation.¹⁸

The Reinsurance Broker is responsible for all aspects of risk transfer to the traditional reinsurance market and /or alternative risk transfer markets in accordance with the Risk Transfer Strategy approved by the Board, with a view to obtaining the best reinsurance terms and conditions for CCRIF. The Reinsurance Broker's specific duties include but are not limited to: (a) reinsurance placement according to the risk transfer strategy approved by the Board; (b) reinsurance administration including reinsurance premiums collection and reinsurance claims settlement; (c) collection of market intelligence and other market monitoring; and (d) assistance to the Facility Supervisor in developing reinsurance placement and other risk transfer strategies. In the day to day execution of his duties, the Reinsurance Broker reports to the Facility Supervisor, under the overall direction of the Board.

Aon Benfield Limited currently performs the role of Reinsurance Broker and was selected for this role through competitive tender in January 2007. Since the first policy year, remuneration for the Reinsurance Broker's services is embedded in the cost of the reinsurance rather than reimbursed under a contract.

The Asset Manager is responsible for investing CCRIF's funds in conformity with the Statement of Investment Principles and Policy and Investment Guidelines approved by the Board. The duties of the Asset Manager include but are not limited to: (a) allocating assets; (b) identifying, establishing and maintaining appropriate third party custodial arrangements for all investment assets; (c) preparing monthly statements of investment performance and detailed quarterly reports to the Board on, among other things, performance against benchmark for the period under review. In the day to day execution of his duties, the Asset Manager reports to the Insurance Manager, under the overall direction of the Board.

London and Capital Asset Management Limited currently performs the role of Asset Manager and was competitively selected from among five shortlisted candidates in March 2008.

The Corporate Communications Consultant is responsible for implementing the CCRIF's Communications Plan with a view to assuring proactive and thorough dissemination of information that will aid in enhancing understanding of CCRIF's role and furthering its overarching strategic objectives. The duties of the Corporate Communications Consultant include but are not limited to: (a) creating and maintaining a website to support CCRIF; (b) collecting content throughout the year and producing the CCRIF's annual report; (c) preparing materials for and providing support in meetings, workshops and seminars involving current and potential new clients, donors and other stakeholders; and (d) coordinating the annual strategic planning session and monitoring progress towards fulfillment of strategic goals.

Sustainability Managers (SM), headquartered in Jamaica, currently performs the role of Corporate Communications Consultant and was selected through competitive tender in the first half of 2009.

¹⁸ The Board is currently retendering the contract for the Facility Supervisor.

CCRIF's operating procedures are set out in the *Operations Manual* (OM). The OM reflects current policies and procedures that are consistent with Cayman Law, the conditions set out in agreements with the Service Providers, and the requirements of the World Bank-administered Grant agreement¹⁹ The OM also sets out policies and procedures concerning planning and reporting, regulatory framework, claims verification and administration procedures as well as a Code of Conduct applicable to all Board members and service contractors alike. This Code enumerates relevant principles in areas including: conflicts of interest, ethical conduct and reporting irregularities. The Insurance Manager has the responsibility to ensure that CCRIF's operations are consistent with the OM. As the OM is expected to contain the most current policies and procedures, each service provider is responsible for formulating drafts of basic policy and operational changes in its areas of responsibility. These are then referred to the Insurance Manager who circulates the drafts to the Board for approval and incorporation in the OM. Pursuant to the Grant Agreement, any changes to the OM must be found satisfactory to the World Bank before being implemented. The OM is to be reviewed at least annually, with changes made as necessary.

4.2 Performance

Operations

The Facility has implemented important recommendations set out in "A Review of the CCRIF's Operation After its First Season."²⁰ These included: (a) updating and ensuring adherence to the OM; (b) strengthening aspects of internal controls having to do particularly with contracts administration and payments; (c) retendering the Insurance Manager's and renegotiating the Facility Supervisor's contracts, respectively, and tendering for a communications firm; and (d) carrying out a claims payout test run for a modeled hurricane of a magnitude to require a reinsurance payout to ensure that established payout procedures would work smoothly.

The Board's strategic decision-making processes run smoothly. It forms itself into smaller thematic subcommittees to develop recommendations on key issues and subsequently the recommendations are taken to the fully constituted Board for final approval. Important operational processes such as minuting the Board meetings, procurement, accounting, reporting, and claims processing have been carried out in a timely manner, the latter well within the period specified in the policies.

Contractual Relationships

The Board's strategy of out-sourcing all technical, communications, administrative and regulatory compliance services has been essential to keeping CCRIF lean. The

¹⁹ These requirements include those relating to anti-fraud and corruption, financial records, and procurement of goods and services.

²⁰ World Bank, December 1, 2008.

effectiveness of this approach is a testament to the caliber of the service providers that the CCRIF has been able to attract and retain. The Board's strong relationships and frequent and open communications with the service providers have only added to the CCRIF's smooth operations.

To consolidate CCRIF as a regional institution, the Board has adopted policies of regular review and periodic retendering of contracts with particular service providers. Thus, the OM envisions three-year contracts as the norm, with annual performance reviews and the possibility of a one-year extension, and requires a mandatory retendering of contracts thereafter. The OM does not, however, oblige the Board to change the current service provider as a result of such retendering, if it is satisfied with the business relationship, the current service provider submits the best proposal, and continuing the business relationship is most to CCRIF's benefit. Careful documentation of the Board's decisions in this regard is important.

Given the highly specialized nature of CCRIF's business, greater periodic recourse to third party technical audits and independent specialized advice could reinforce the Board's discharge of its oversight functions. Such audits might, for example, focus on actuarial assessments of CCRIF's financial and risk management strategy or on proposed new products. It might also be useful to seek legal support to review or advise on MOUs and contracts.

Communications

Strengthening communications with stakeholders remains a priority for the Board and was one of the recommendations from "A Review of the CCRIF's Operation After its First Season." In the last quarter of 2008–2009, the Board tendered for a corporate communications firm and, as noted in Section 3.6, made the strategic decision to hire one with specialized experience in the Caribbean and on sustainable development issues. The contract with Sustainability Managers was signed in June 2009 and the Board took another important step forward when it approved the firm's proposed communications strategy in September 2009. In addition, CCRIF's 2009–2012 Strategic Plan received wide distribution throughout the Region in its 2009 Annual Report.

Sustainability Managers has already begun to disseminate more broadly a range of products to strengthen the availability of information about CCRIF, its products, and activities and, thereby, enhance CCRIF's transparency and outreach. These tools include Quarterly and Annual Reports, press releases on catastrophe events and CCRIF's response thereto, and on CCRIF's sponsorship of or participation in conferences or other expert fora, specialized materials prepared for such fora, a revamped website, and the recently launched Newsletter. These materials are distributed to an increasingly broad spectrum of stakeholders.

It will be important to supplement information dissemination with further proactive engagement with clients. While recognizing the real time constraints that Caribbean decision-makers and senior officials face, such engagement would ideally occur throughout the year rather than primarily during the annual policy renewal period or on the fringes of conferences or other events at which CCRIF Directors or the Facility Supervisor may

encounter officials of CCRIF's member countries and territories. Based on the limited number of interviews that were conducted for this review, there is wide appreciation for CCRIF's press releases and other bulletins, as well as the Facility Supervisor's and his staff's accessibility to respond to their questions. At the same time, many stakeholders expressed a desire for a closer connection.

Enhanced engagement could be particularly important at this time to maintain full participation among the 16 member countries. The need of several participating countries to borrow from the CDB and their delay in paying for their 2009–2010 coverage could presage difficult deliberations about whether continuing CCRIF coverage should be a public expenditure priority in 2010–2011.

The Directors are already fully aware of the need to increase CCRIF's transparency and continue reinforcing its members' perceptions of the affordability and value of participating in CCRIF. In this connection, proactive engagement could have a number of important benefits, among them the opportunity in a more personal and customized fashion and separately from a discussion of policy renewal to:

- **Continue to convey and reinforce the message about what CCRIF is and what it is not.** CCRIF has been at pains to convey its character as a joint reserve facility, the nature of its parametric policies, and the limited, albeit important, role that catastrophe insurance can play in what must be a country's broader disaster risk management plan. It was clear from the interviews conducted for this review that this message still bears repeating, including to the media.
- **Explain and answer questions about the benefits of the second generation loss model that CCRIF is developing.** Some interviewees commented on their perception of a lack of transparency of the modeling that underlies CCRIF coverage and the corresponding lack of understanding of the basis risk inherent in parametric policies. CCRIF's second generation loss model is intended to address both of these matters and comparing and contrasting the first and second generation models will help to illustrate this. Proactive interaction with member countries and other stakeholders during the roll-out of the new model will be necessary to complement written materials prepared by the Corporate Communications Consultant.
- **Interact with a broader range of country officials than the finance or budget officials that have direct responsibility for deciding on renewing CCRIF coverage to strengthen perceptions of CCRIF's value-added.** Such officials might include those from technical and scientific agencies such as meteorological or disaster response agencies. Based on the limited number of interviews conducted for this review, such agencies are generally not aware of nor fully understand the service provided by CCRIF. National hydrologists and meteorologists would likely be able to relate more easily the implications of the parametric nature of CCRIF's policies to the country's own historical weather patterns. Officials of disaster response agencies would likely see how a rapid cash infusion from CCRIF in the wake of a disaster could facilitate their work.

The Board is also aware of the public goods dimension of interacting with a range of regional non-governmental stakeholders to benefit from their specialized expertise and share CCRIF's own knowledge. To this end, as indicated above, CCRIF signed MOUs with the CDERA and the CIMH, with a view to employing their individual expertise in research and development, obtaining their assistance in training disaster risk professionals in the Caribbean region, and benefiting from their compilations of weather data in order to refine CCRIF's services. As of May 2009, discussions were well advanced with ECLAC and the UWI regarding MOUs. CCRIF had also made an initial contact with CARICOM regarding a possible MOU. These relationships are discussed in greater detail in Chapter 7.

4.3 Recommendations

After more than two full seasons of successful operations, CCRIF has firmly established itself. The Board, with the support of the Insurance Manager, Facility Supervisor, communications consultant, and other service providers, has taken a number of steps to refine CCRIF's procedures and practices in order to strengthen it further as an institution.

Every institution, however, is a work in progress. As certain priorities have been addressed, the Board has identified new ones. In pursuit of these priorities and further consolidation of CCRIF as a regional institution, it will be important for the Board to:

1. ensure that the OM remains current and reflects consistency with other relevant documentation and CCRIF's practices and procedures;
2. continue to enhance direct communication between CCRIF and a broader range of the participating countries' agencies and officials through targeted dissemination of quarterly newsletters and other CCRIF publications and, to the extent feasible, through in-person contacts;
3. document carefully decisions regarding contract extensions and retendering; and
4. commission periodic independent technical and actuarial audits of existing and new products to strengthen further the Board's oversight of the relevant operational functions and enhance the market acceptability of those products.

5. Financial and Risk Management

5.1 Policies, Risks, and Claims

For the 2008–2009 season, CCRIF wrote 30 policies, providing hurricane coverage to all 16 participating countries and earthquake coverage to 14 and incurring an aggregate exposure of \$562.1 million, compared with \$494.8 million in 2007–2008 and \$601.2 million for the current, 2009–2010 season. There is considerable variation in individual policies, reflecting the size and risk exposure of countries, and the severity of events that countries elect to cover. Coverage for individual policies varies from around \$1 million to \$100 million and coverage for countries varies from 0.3 percent to 12 percent of their GDP.

CCRIF's average annual loss (AAL) under these policies is \$10.5 million, based on the EQECAT model it uses. The probabilities of different ranges of losses are shown in Table 5.1a below. CCRIF is expected to have no claims in 37 percent of years, but has a 6 percent chance of annual claims of \$50M or more.

As a result of the fairly mild hurricane seasons and lack of significant earthquake activity, CCRIF's payouts were less than its AAL during its first two seasons and in its third through end-December 2009. Claims paid totaled \$947,000 in 2007–2008 and \$6.3 million in 2008–2009. As of end-December 2009, there had been no payouts in the third season.²¹ Table 5.1b summarizes information on policies, risks, reinsurance and claims for the first three seasons through end-December 2009.

21 In 2007–2008: \$419,000 to St. Lucia and \$528,000 to Dominica following the November 29, 2007 earthquake. In 2008–2009: \$6.3 million to the Turks and Caicos Islands following Hurricane Ike in September 2008. Although the first half of CCRIF's third policy year saw no payouts, this changed dramatically with the \$7.75 million payout to Haiti following the 7.0 magnitude earthquake that devastated Port au Prince on January 12, 2010.

Table 5.1a: Loss Probabilities for 2009–2010

Annual Claims (US\$ millions)	Probability (percent)	Covered by
Nil	37.34	CCRIF
0–20	46.16	CCRIF
20–50	10.45	Reinsurance
50–100	4.84	Reinsurance
100–152.5	1.14	Reinsurance
152.5–601.2	0.07	CCRIF ¹

¹ As discussed in Section 3.4, CCRIF faces the risk of default. While it bears the risk for the first \$20 million in claims and for all claims above \$152.5 million, its reserves and the balance of available donor resources are not sufficient to cover all remaining risks up to the total of its \$601.2 million exposure. If an event were to occur that exceeded CCRIF's capacity to pay claims in full, it would pay claims on a pro rata basis until its reserves were exhausted and then, barring an extraordinary capital injection, would become insolvent.

5.2 Reserves

CCRIF's assets totaled \$78.6 million as of end-May 2009. These were obtained from members' participation fees, accumulated investment income, retained earnings from premium payments for the 2008–2009 season, and donor contributions disbursed through the MDTF. Shareholders' net assets totaled \$43.4 million. The MDTF reimburses CCRIF for eligible expenditures, including reinsurance costs, claims paid within CCRIF's risk retention, payments to service providers and certain other operating and R&D expenses.²² Barring a catastrophic event requiring a payout that exceeds CCRIF's reinsurance, CCRIF will be able to grow its reserves until the MDTF expires. The low level of CCRIF's payouts in its first two years of operation has allowed it to increase its net income and build its reserves more rapidly than was projected. The low level of payouts has also resulted in the MDTF being drawn down more slowly than expected.

Table 5.2 summarizes the MDTF's significant contribution to CCRIF's net income. Information in it is taken from CCRIF's audited financial statements for May 31, 2009, but is presented in a different format.

²² As of end-May 2009, the end of CCRIF's second policy year, \$67.4 million had been contributed by Bermuda, Caribbean Development Bank, Canada, European Commission, France, IBRD, Ireland, and United Kingdom. Further contributions to the MDTF are not currently expected. Net investment income added approximately another \$3 million to the trust fund balance as of end-May. Of the total, \$50.0 million has been committed in a Grant Agreement to CCRIF, of which \$20.7 million had disbursed as of end-May. Thus, \$49.7 million remained available to CCRIF as of that date, consisting of: \$29.3 million committed but not yet disbursed under the CCRIF Grant Agreement, plus approximately \$20.4 million that had not yet committed from the MDTF to CCRIF.

Table 5.1b: Approximate Statistics for the First Three Seasons
(as of December 31, 2009)

Year	2007–2008	2008–2009	2009–2010
Number of Countries Covered	16	16	16
Number of Policies Sold	29	30	29
Total Premium Income (US\$ millions)	19.5	21.8	21.5
Of which: Reinsurance Cost (US\$ millions)	8.9	9.7	8.7
Expected Claims Payout (US\$ millions)	7.9	9.6	10.5
Of which: Covered by Reinsurance (US\$ millions)	4.6	5.5	4.8
Expected Claims Retained by CCRIF (US\$ millions)	3.3	4.1	5.7
Premium Multiple of AAL	2.5	2.25	2.0
Total Reinsurance Multiple	1.9	1.7	1.7
Aggregate Excess of Loss Reinsurance (US\$ millions)	10–120	12.5–145	20–152.5
Retained Risk ¹ (US\$ millions)	0–10 & 120+	0–12.5 & 145+	0–20 & 152.5+
Total Sum Insured (US\$ millions)	494.8	562.1	601.2
Probability of No Claim Payout (%)	43	38	37
Probability of No Reinsurance Payout (%)	79	79	84
Actual Claims Experience (US\$ millions)	0.95	6.3	None ²

¹ See Footnote 1 to Table 5.1a.

² “None” as of end-2009. CCRIF paid a claim of \$7.75 million to Haiti in connection with the January 12, 2010, earthquake.

Table 5.2: CCRIF's Net Income
(U.S. dollars)

Income/Expenditures	2007–2008	2008–2009	Total 2007–2009
Gross premium income	+19,488,512	+21,838,512	+41,327,024
Investment income	+1,207,546	+2,597,588	+3,805,134
Net reinsurance cost	0	0	0
Gross cost	-7,843,125	-9,277,106	-17,120,231
MDTF reimburse.	+7,843,125	+9,277,106	+17,120,231
Net claims paid	0	0	0
Gross payments	-946,997	-6,303,913	-7,250,910
MDTF reimburse.	+946,997	+6,303,913	+7,250,910
Net fees & expenses	-745,544	-966,157	-1,711,701
Gross fees & exp.	-1,324,582	-1,406,171	-2,730,753
MDTF reimburse.	+579,038	+440,014	+1,019,052
Net income w/o MDTF	+10,581,354	+7,448,910	+18,030,264
From MDTF	+9,369,160	+16,021,033	+25,390,193
Net income incl. MDTF	+19,950,514	+23,469,943	+43,420,457

Box 5.2: Ideal Level of Reserves

The ideal level of reserves balances the requirements of security and value for money.

CCRIF's Board and its members have a common interest in striking the right balance between the two.

Large reserves allow CCRIF to withstand large claims, while retaining more risk itself rather than purchasing reinsurance. With assets approaching the declared objective at inception of \$100 million, CCRIF's financial strength is increasing and it could now consider higher risk retention.

There is, however, a tension between reserve accumulation, which derives in part from CCRIF Members' annual premium payments, and the opportunity cost of the reserves.

Given the Members' other expenditure needs, it is important for CCRIF to achieve the right balance between its own security and the value it provides to its Members. Given CCRIF's strong reserve position, it is in a good position to consider some further lowering of premium costs to the participating countries.

5.3 Reinsurance and Risk-Bearing Capacity

CCRIF uses catastrophe risk transfer instruments to protect itself against insolvency, because claims could exceed its own financial capacity. For its first three seasons, CCRIF has purchased “aggregate excess of loss” reinsurance, which is linked to the total level of claims made on CCRIF during a policy season, rather than to individual claims or countries. CCRIF’s reinsurance consists of a swap intermediated by the World Bank Treasury in capital markets and contracts with traditional reinsurers, for which Aon-Benfield serves as CCRIF’s broker and advisor.

As CCRIF’s reserves have grown, it has increased its risk retention. At the same time, it has also increased its reinsurance limit, thus increasing the total claims it can pay without endangering its long-term solvency. Table 5.3 illustrates the growth in CCRIF’s risk retention and reinsurance.

CCRIF’s level of reinsurance in 2008–2009 ensured that it would pay out no more than \$12.5 million, unless the Caribbean were to have experienced an historically unprecedented series of catastrophe events with a probability of less than 1 in 1,000 years, a “millennial” event. CCRIF’s reinsurance—covering losses from \$12.5 million to \$145 million (\$132.5 million in excess of \$12.5 million)—gave it the capacity to withstand a millennial event, in fact, enough claims paying capacity for an event estimated by CCRIF’s first generation model to have a return period of more than 1,400 years. Moreover, with CCRIF’s additional capital, it had the capacity to withstand a series of catastrophe events estimated by the model to have probability of less than one in 10,000 years.²³ This is, however, no cause for unbounded optimism, as a payout resulting from a major disaster that struck three of CCRIF’s largest policy holders could exceed the limit of CCRIF’s reinsurance.

Table 5.3: CCRIF’s Risk Retention and Reinsurance
(\$ millions)

Retained/Reinsured	2007–2008	2008–2009	2009–2010
CCRIF (retained)	0–10	0–12.5	0–20.0
Reinsured	10–120	12.5–145	20–152.5
CCRIF (retained) ¹	120–494.8	145–562.1	152.5–601.2

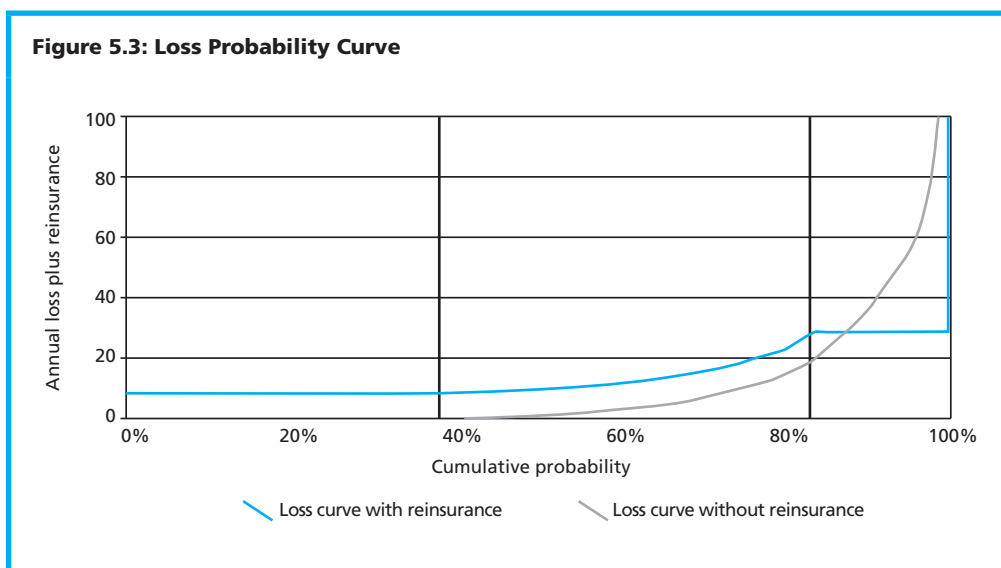
¹ See Footnote 1 to Table 5.1a.

²³ Two examples of ways in which CCRIF’s total annual claims would conceivably breach \$200 million follow, but both are very unlikely. The first scenario would be two or more storms leading to very high payouts for at least five out these CCRIF members: The Bahamas, Barbados, the Cayman islands, Dominica, Grenada, Haiti, Jamaica, St. Lucia, or Trinidad and Tobago. The second scenario would be one big earthquake affecting Trinidad and Tobago or Jamaica and a big multi-island storm or two in the same year.

Figure 5.3 shows the probability of CCRIF's annual losses for the 2009–10 season, without reinsurance and with reinsurance. Without reinsurance (the gray curve), CCRIF has a 37 percent chance of no loss; a 46 percent chance of a loss of less than \$20 million; and a 17 percent chance of sharply rising loss in excess of \$20 million. These three loss ranges are marked with the black vertical lines. The blue curve incorporates CCRIF's reinsurance and shows CCRIF's expenditure on reinsurance and uninsured losses. For the 83 percent of cases where losses are less than \$20 million, CCRIF is spending \$8.65 million on reinsurance and receiving no reinsurance payment. But in return for the reinsurance premium, CCRIF can be confident that, in the absence of a millennial event, its expenditures on losses and reinsurance are capped at \$28.65 million.

Deciding the amount of reinsurance to purchase requires balancing the need for protection from the risk of insolvency over the long-term against the cost of reinsurance and its effect on net income in the short-term. As the reinsurance premium paid is higher than the annual average loss, purchasing reinsurance reduces CCRIF's average net income in the short-term (barring events that result in payouts above the AAL). For example, CCRIF's AAL is calculated to be \$10.52 million without reinsurance and \$5.71 million with reinsurance. For this \$4.81 million reduction in AAL, CCRIF pays a reinsurance premium of \$8.65 million, or 1.7 times the \$4.81 million reduction in expected claims. This should be compared with the cost of self-retention.

Continuing to hold reinsurance against a high level of claims protects CCRIF not only from insolvency but also from the possibility that the loss model itself is not precisely correct. Despite the time and effort spent on any risk model, the probability of catastrophic hurricanes and earthquakes is difficult to quantify. For example Hurricane Katrina has been assessed by different organizations as both a 1-in-40 and 1-in-400 year event.²⁴ Similarly CCRIF cannot be sure that exhaustion of its reinsurance really is a millennial event.



24 "The Ascent of Money", Niall Ferguson, Penguin 2008. Page 183.

Non-financial considerations also enter into the decision regarding the amount of reinsurance to purchase. By increasing its retention, CCRIF is less likely to make a reinsurance claim, and this can encourage better reinsurance pricing in future years. Also, increasing the upper limit of the reinsurance, which can be done at a relatively small cost, can make it easier to bring in an additional reinsurer.

With CCRIF having gained in visibility and credibility with reinsurers, the Board renegotiated the broker's fee to reduce the cost of reinsurance, beginning in the 2010–2011 season (the fourth season). For the first three seasons (2007–2008 to 2009–2010), the price paid for reinsurance included a commission to the reinsurance broker Aon Benfield. The commission was determined by an agreed formula and was equivalent to 10 percent of the first \$5 million of premium, 5 percent of the next \$10 million, and 4 percent of the remainder. The new arrangement is a fixed fee, which is expected to produce important savings.

5.4 Investment Strategy

CCRIF had total assets of \$78,622,390 as of May 31, 2009, including cash of \$17,827,229 held in bank accounts in the Cayman Islands and investments of \$53,174,430 managed by London & Capital, administered by Citibank, and audited by Moore Stephens.²⁵ **CCRIF's investment policy specifies performance objectives for the investment manager and prohibits or restricts investing in specific classes of assets.** The policy requires that reserves be invested in a diversified portfolio of cash and fixed and variable rate debt instruments, although it also allows the manager to invest in pooled funds and use derivatives for portfolio management purposes. The performance objective is to outperform the one-month US dollar London Interbank Offer Rate (LIBOR) by at least 75 basis points per annum, while keeping volatility at or below a target of 3 percent per annum.²⁶ The performance of the fund compared to this objective is presented at Board meetings every quarter.

The investment manager uses derivatives to remove almost all currency risk and manage duration risk. It actively manages the fund based on its views and, in particular, has increased the account's previously low exposure to lower-rated bonds and financials as the economy has shown signs of recovery. Performance to date has been strong, despite a turbulent year in the financial markets: between inception and August 31, 2009, the fund achieved a return of 8.5 percent compared to the benchmark of 3.5 percent.

With CCRIF's evolution from a start-up to a more mature, financially stable entity, the Board is reviewing aspects of CCRIF's cash management and investment policy,

25 Of the \$7.6 million balance (the difference between CCRIF's total assets and the sum of those held in cash and with London & Capital), amounts due from the MDTF totaled \$6.8 million, with the remainder accounted for by accrued interest, prepaid expenses, and unrealized gains on forward and futures contracts. Note that this review does not analyze the strategy for investing the undisbursed balance in the MDTF, as the contributing donors have delegated responsibility for such investment to the World Bank.

26 In order to accommodate short-term fluctuations while still aiming for the 3.0 percent volatility target, the investment manager has a volatility allowance of 4.5 percent.

particularly asset liquidity and benchmark. CCRIF's needs for liquidity relate primarily to claims payment. In the event of a claim, CCRIF can draw on the MDTF for claims up to \$20 million²⁷ and on reinsurers for claims above \$20 million up to the coverage limit. In the absence of a millennial event, the MDTF and CCRIF's reinsurance are forecast to be sufficient to meet any claims for the next two seasons and its reserves, which already cover more than thrice the \$20 million retention for 2009–2010, will continue to grow. A simulated event test conducted in August 2009 demonstrated that CCRIF can obtain funds from these two sources within 10 calendar days from their receipt of its request.²⁸ This is sufficient for CCRIF to be able to make payments to claimant countries within the time frame specified in the policies.²⁹ To play claims, CCRIF also has recourse to its own bank accounts, which held nearly \$18 million in cash at the end of the second season, and its own investments of \$53 million, which are almost all held in assets which could be redeemed within three days.

Given these conditions, the Board might consider discussing with the investment manager whether CCRIF's expected returns could be improved without undue risk by:

- holding less cash and amending its investment policy to set an explicit target for liquid assets based on its needs and give the investment manager freedom to invest in less liquid assets in search of a higher return; and/or
- adopting a benchmark longer than the LIBOR one-month cash rate currently applied, one possibility being the 5-year U.S. Treasury bond yield, thus aligning the investment assets' maturity better with CCRIF's liabilities, i.e., its expected claims over the next three or so years.

5.5 Pricing

CCRIF considers a range of factors in determining the pricing of its policies. To build reserves and lower the chance of insolvency, the long-term aggregate premium contribution from participating countries must be higher than the AAL of the aggregate CCRIF portfolio in order to cover CCRIF's operating expenses, professional fees, and the cost of reinsurance. Determining the appropriate premium rate requires balancing the tension between interests of the participating countries and those of CCRIF and the donors that have supported its establishment and development. While the former have an interest in a strong CCRIF, they face competing demands on their limited fiscal

²⁷ Based on CCRIF retention for the 2009–2010 policy year.

²⁸ In fact, the World Bank transferred \$7.75 million to CCRIF from the MDTF to cover the projected pay-out to Haiti within roughly 24 hours of its receipt of CCRIF's withdrawal application.

²⁹ CCRIF's standard policy conditions provide that the index calculation shall be made within 14 calendar days following the time at which the hurricane passes closest to the first measurement point in the Insured's country. Assuming that the calculated index value is high enough to trigger a payout, the payout is to be made within 14 business days following the index calculation, although CCRIF has the discretion to delay payment to not more than 90 days following receipt of the Insured's claim. Business days are defined as days on which banks in the Cayman Islands are open for regular business.

resources and, thus, may attach even more weight to having premiums that offer the greatest perceived value-for-money. On the other hand, CCRIF and the donors, while also seeing the importance of delivering value-for-money, have had a special interest in a premium rate in the early years that would facilitate quickly building reserves so as to ensure CCRIF's financial sustainability by the time that the MDTF is depleted.

In simple terms, catastrophe insurance pricing is a function of the AAL of the insured peril, the cost of capital, and the expense load (e.g., administrative costs). The cost of capital enters into the equation to compensate CCRIF for securing large amounts of capital, either through its own reserves or through reinsurance. Significant capital provision (with its associated cost) is essential to ensure that CCRIF can pay on time all valid claims.

A modification of CCRIF's pricing method might be considered to capture better the impact of the individual country's policy on the risk exposure of CCRIF's aggregate portfolio. To date, CCRIF's pricing method has relied only on the individual member's AAL. This approach has the benefit of simplicity. Based on best practices in the catastrophe and reinsurance industries, further refinement of pricing method should be considered, where the premium rates would be based on both the individual country's AAL and the contribution of its probable maximum loss (PML) to the PML of CCRIF's aggregate portfolio (with a given return period). With this pricing method, a country with a lower AAL but a higher loss volatility would contribute more to CCRIF.

Premium Rates and Premium Levels

To date, CCRIF has deliberately pursued a well-founded policy of charging a premium that has rapidly built reserves. The objective has been to ensure that CCRIF will be in a strong position when the MDTF is no longer available to cover CCRIF's loss retention. Aware of the participating members' needs, however, as CCRIF's reserves have grown more rapidly than expected, due in part to its low claims history, the Board reduced the premium rate by 10 percent from the first season to the second and by 11 percent from the second season to the third.

There are a number of reasons why the premium rate might change from year to year. For example, CCRIF might need to lower (or raise) premium rates when it has experienced a run of low (or high) claims in order to maintain reserves that are neither excessive nor imprudent and, as just noted, CCRIF has so far been able to lower its rate. Another reason to consider varying premium rates is that reinsurance costs change through the insurance cycle because of changes in the strength of reinsurers and the level of competition among them. Varying the premium rate enables CCRIF to pass on to the participating countries some of the effects of its claims history and changes in its reinsurance costs, or to absorb these effects in the level of its reserves.

Despite these considerations, CCRIF was designed explicitly to buffer or shield its members from volatility in its claims history and reinsurance costs to the extent permitted by its reserves. The objective of this design was, and remains, to facilitate CCRIF's members' fiscal management. Thus, while CCRIF has passed on to its members through rate reductions the benefits of its growing and now substantial reserves, it aims to avoid

to the extent possible having to pass on to its members through higher rates the effects of a heavy hit on its reserves and/or a possible increase in its reinsurance costs.

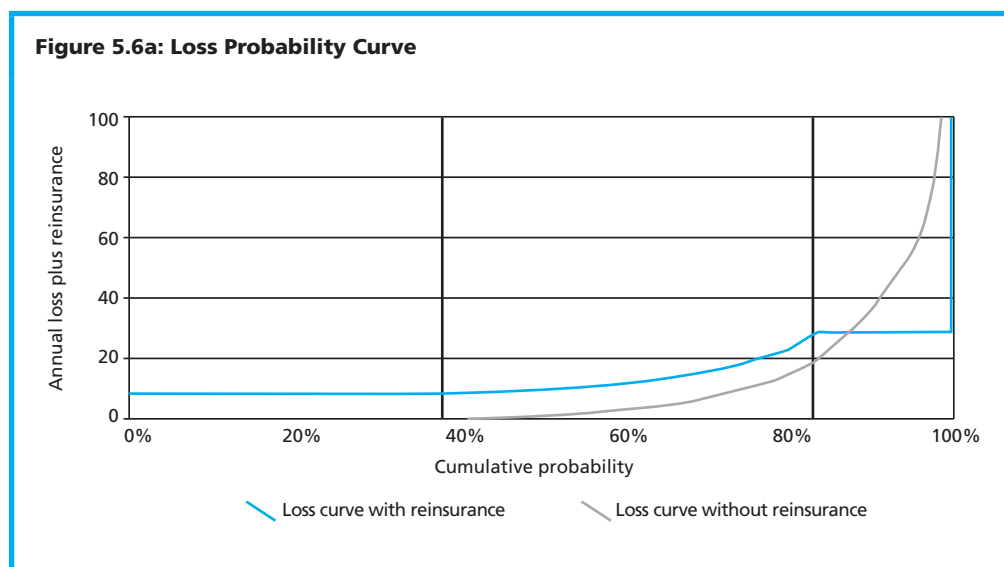
To date, the change in premium rate has been effected by increasing the level of coverage and maintaining a stable premium amount. This stability has had the advantage of simplifying the budgeting process of participating countries. This approach has also benefited the countries by providing them with greater protection, given that, at this juncture, most CCRIF members are relatively under-insured in light of the risks they face and scant capacity to self-insure. The alternate approach to benefit from rate reductions—maintaining the same cover and varying the premium amount—would require careful communication to ensure understanding of the difference between a country's premium for the current year and the long-term premium it should allow for in its budget. One way to do this would be to communicate the current premium as a combination of the long-term premium and an explicit profit-share.

5.6 Projections for Different Risk Management Strategies

Dynamic Financial Analysis

CCRIF uses a dynamic financial analysis (DFA) model, which makes long-term projections of its finances under different catastrophe and financial scenarios. By sampling from a large number of possible scenarios, the DFA model can analyze not only the best-estimate outcome but also the probability of particularly good or bad outcomes.

CCRIF currently uses the DFA to check whether the pricing/reinsurance approach taken in the current season would give an acceptably low probability of insolvency if maintained over the longer-term. The resulting loss-curve (Figure 5.3 above, reproduced below as Figure 5.6a) shows the distribution of losses over a single year, but does not

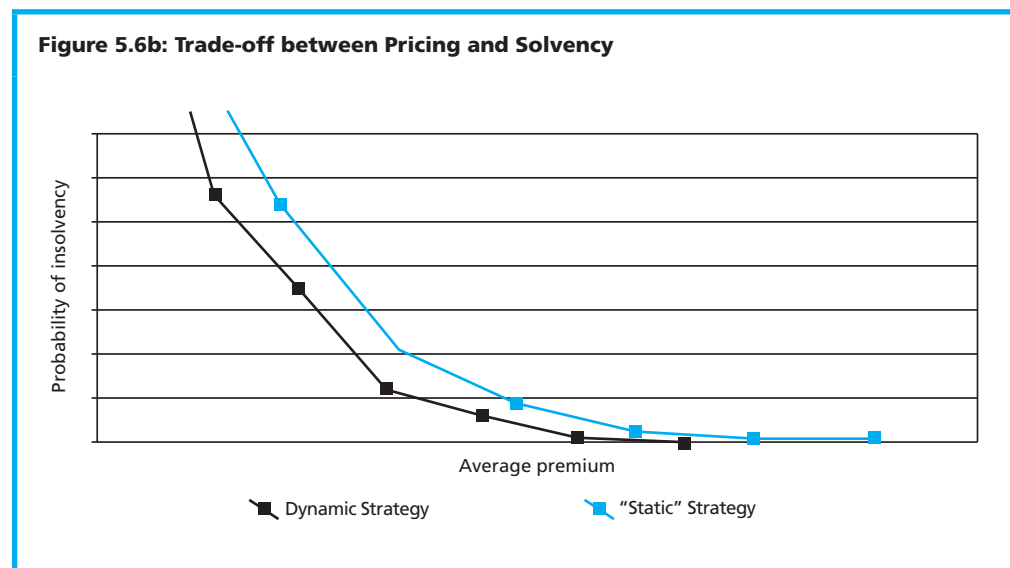


by itself show the risks from a succession of seasons with large claims, or the effect of other factors on solvency, such as poor investment returns or high reinsurance costs. For example, if CCRIF retained risk equal to its total reserves, this would avoid insolvency during one season, but leave CCRIF in a severely weakened position if it experienced high claims in subsequent seasons before it could rebuild its reserves.

The DFA model can also be used to test the effects of different long-term strategies, without endangering CCRIF or the participating countries. In particular, the DFA model can also analyze “dynamic” strategies wherein the pricing/reinsurance decisions for a future year reflect the projected financial or other conditions at that time. For example, a simple dynamic strategy would be to charge a premium equal to twice the AAL if reserves were below \$50 million and 1.5 times the AAL otherwise. A well-chosen dynamic strategy planned in advance can often give significantly better results than a succession of choices based on the forthcoming season.

Pricing and Insolvency

Figure 5.6b shows the inverse relationships between pricing and solvency that arise when the DFA is used to develop a dynamic strategy and when it is not. The blue curve portrays the trade-off between cost and sustainability in the latter case. The six dots represent the results of six different runs of a DFA model.³⁰ Each run uses a different fixed premium rate but keeps all other aspects (e.g., reinsurance, financial conditions) constant. Ideally, CCRIF would like to be towards the bottom-left of the chart, with a low probability of insolvency and a low premium, but the figure shows that this is not possible. The relationship is a curve rather than a straight line, such that repeated



³⁰ We have used a simplified version, rather than CCRIF's own model.

increases in the premium rate give progressively smaller reductions in the probability of insolvency.

The black curve and markers represent a simple dynamic strategy that entails greater variation—plus or minus—in the premium rate and illustrates that it is preferable to the more static approach. Each black run has two premium rate levels and charges the lower premium when CCRIF's reserves are above a threshold.³¹ The black line lies below and to the left of the blue line, indicating that dynamic strategies are more efficient because, for a given average premium, there is a lower probability of insolvency.

Five-year Plan

The Facility Supervisor is currently preparing a strategy paper to set out a five-year plan for determining premium and reinsurance policies. The plan will incorporate results from the DFA model and describe how premiums and reinsurance will vary according to different future conditions such as the level of CCRIF's reserves and reinsurance market conditions. This is a welcome development and making the plan available to the participating countries upon its adoption by the Board of Directors would increase the transparency of CCRIF's policies. Because this work is under way, the following focuses on discussing some qualitative principles, rather than on producing a similar quantitative analysis.

Limitations of the DFA

The DFA model can answer the objective question of which strategy is more efficient (the dynamic one), but it cannot answer the subjective question of the right balance between premium and probability of insolvency, i.e., where to locate on the curve. As already noted, some degree of tension may exist on this matter between CCRIF and its participating countries. The countries may place more weight on a low premium, while CCRIF may lean more to a location on the curve with a low probability of insolvency. In addition, the DFA is a simplified pragmatic model that excludes some qualitative features of the real world, the effects of which cannot easily be modeled. For example, while CCRIF anticipates expanding to include new products, particularly excess rainfall coverage, and attract new members, the current DFA model implicitly assumes that the number of policies will remain constant over the long-term.

5.7 Non-Financial Risks, Openness, and Consultations

Non-financial Risks

CCRIF faces non-financial, as well as financial risks to its sustainability and openness, consultation, and published policies have an important role to play in mitigating the

³¹ A better strategy would have a smooth relationship between reserves and premiums, but this simple approach is good enough to illustrate the impact of a dynamic strategy.

former. One of the biggest non-financial risks is the continued participation of CCRIF's member countries. CCRIF's strength and its attractiveness to the participating countries stems from its pooling of risk. Pooling permits the participating countries to insure through CCRIF at a price that has been estimated at half what they would obtain if they approached the reinsurance industry on their own. Thus, stability in the number of countries in the pool is important, particularly given that, due to CCRIF's geographic focus, its membership is by definition limited. The fewer the participating countries, the more costly CCRIF's insurance would need to be to ensure CCRIF's financial sustainability.

Several factors may influence member countries' decision to continue participating in CCRIF. These are: (i) possible constraints on their ability and willingness to continue paying premiums, given current fiscal constraints; (ii) their perceptions of the value of CCRIF's parametric coverage; (iii) the extent of their understanding of the nature of CCRIF's parametric coverage; and (iv) the subjective as well as financial value they derive from solidarity in supporting a nascent Caribbean institution.

- *Fiscal Constraints:* As indicated previously, several CCRIF member countries decided to resort to borrowing from the CDB or to assistance from donors in order to pay their 2009–2010 premiums. Such assistance, including from the CDB, is not assured for future seasons.
- *Perceptions of Value:* Insurance coverage as a proportion of GDP varies enormously from member country to country. Some of the relatively richer countries have a maximum payment under the most extreme tropical cyclone of just 0.3% of GDP.
- *Extent of Understanding:* The level of knowledge of CCRIF's insurance is variable throughout the region. There is evidence that officials in some of the participating countries have been surprised when affected by a storm that did not result in a payout. Within the general population, some have also been distressed and angry at the lack of payout despite their having suffered great personal loss, and this kind of frustration can generate political pressures on governments in some cases. There were examples of such frustration and pressure following Hurricane Dean during the 2007–2008 season and Hurricane Paloma during the 2008–2009 season.
- *Solidarity:* Some countries may be participating in order to build the reach and capacity of Caribbean institutions. This may be particularly important for CCRIF which, as a joint reserve mechanism or mutual insurance company, is a channel through which the member countries can assist each other in times of natural disasters. Thus, CCRIF's payouts to St. Lucia, Dominica, and Turks and Caicos Islands may be seen as the contribution of other CCRIF members to their immediate relief and recovery needs.³²

³² CCRIF's payout to Haiti in the wake of the tragic earthquake in January 2010 is, of course, another example of such solidarity and how CCRIF functions as a joint reserve mechanism, as CCRIF's financial capacity to make the payout is underpinned by other CCRIF members' financial contributions (premiums) to the Facility. It should also be noted that a number of CCRIF members are contributing directly to Haiti's recovery through financial and in-kind contributions.

Openness, Consultation, and Published Policies

The risks outlined above emphasize the importance of openness, consultation, and published policies. Greater transparency could increase understanding of and serve to maintain strong support for CCRIF among its participating countries, and in regional institutions such as CARICOM. To enhance transparency, it would be helpful for CCRIF to publish a written statement of its principles for key aspects of its operation. This statement could be disseminated in a variety of ways (e.g., on CCRIF's website and in brochures or fact sheets that could be made available to a broad range of member country officials, including their disaster management officials) and an effort could be made to solicit interested parties' views.

Relevant principles would relate to the variability or stability of premium rates, reserves accumulation, and operational and other expenditures, including technical assistance and broad outreach activities.

- *Variability/Stability of Premium Rates:* It would be useful for CCRIF to describe the factors influencing premium costs. It could also explain how it allows for smoothing across insurance and economic cycles.
- *Reserves Accumulation:* CCRIF might describe its policy regarding reserves accumulation. This would include the choices available between the level of premiums charged and the resulting risk of insolvency and its reasons for choosing a very low risk of insolvency compared to other insurance institutions. This might also include the rationale for its strategy, when reserves are strong, of lowering premium rates and increasing coverage, rather than lowering premium amounts and maintaining coverage.
- *Technical Assistance and Outreach Expenditures:* Finally, it would be useful for CCRIF to elaborate publically on its strategy that underpins its choices regarding, for example, the amount and type of spending on outreach to other Caribbean institutions, the scope and focus of the scholarships program recently announced, and participation in a wide range of international conferences and other fora.

CCRIF's decision to hire a specialized communications firm is a welcome step towards increasing its transparency and improving understanding of its products and policies. The choice of a firm with knowledge of Caribbean institutions and media outlets appears particularly wise and augers well for effective communications.

5.8 Operational and Other Budgets

Operating and Administrative Costs

CCRIF has a guideline that recurring operational and administrative expenses should be no more than 5 percent of premium income. This guideline is intended to be broadly

Box 5.7: Communications and Consultations Strategies

CCRIF and the Pension Protection Fund (PPF), a centralized insurance fund for corporate pension funds in the United Kingdom, face similar transparency issues. Both CCRIF and PPF are non-profit facilities that started operation recently. Both are subject to public scrutiny and must find a delicate balance between value-for-money and financial sustainability, and between simplicity and perceived fairness.

The PPF has adopted a strategy of being very open with its policies and plans. Whenever it looks to make a change, it develops a policy, publishes it openly for a consultation period, and (potentially) revises it in light of responses to the consultation. This approach has helped to establish the PPF's reputation as a thoughtful and reasoned operation.

A similar strategy for transparency and consultation could be beneficial for CCRIF. There are, however, differences between the PPF and CCRIF, which could require a different approach. The PPF is larger and its policyholders and their advisers have greater access to relevant expertise in order to comment on a consultation. CCRIF has fewer policyholders and they have more limited insurance expertise. Thus, it could be effective for CCRIF to communicate more directly and individually with them.

in line with the ratio for other captive insurers, which is estimated at about 3 percent, while recognizing the differences between CCRIF and other captive insurers in terms of the scope of their operations. The operating budget does not break out fees paid to the reinsurance broker and the investment manager and custodian. These costs are, respectively, included in the reinsurance premium and netted out of the income on managed assets.

Research and Development Costs

CCRIF has a separate budget line for research and development expenditures, which do not fall within the 5 percent guideline. Creation of this budget reflects a recommendation made to the Board in the review of CCRIF's first season of operation. This budget funds non-recurring expenditures for new product development—such as excess rainfall and CARILEC—and for developing the second-generation loss modeling framework. The R&D budget also helps fund member countries' and partner institutions' access to KAC's Real Time Hazard and Impact Forecasting System (RTFS), which also supports CCRIF's second-generation loss model. The Facility Supervisor's expenses related to R&D are incorporated in his contract fees. The Executive Chairman's fees and travel expenses related to R&D activities are broken out separately in the R&D budget.

Technical Assistance and "Broad Mandate" Outreach Costs

Following on discussions that the Board began in 2008–2009 on ways to continue increasing CCRIF's value added to the member countries, it approved in September 2009 a separate budget line item for technical assistance and "broad mandate" outreach costs. This budget is to include unanticipated ad hoc activities by the Facility Supervisor

(to be approved in advance), technical assistance to member country agencies, work with specialist partner agencies, such as CIMH and CDERA, and sponsorship of conferences and CCRIF's and member countries' attendance at them. For example, CIMH has provided outreach support to national meteorological and, through CDERA, disaster management agencies in connection with support for disseminating the RTFS. In addition, CCRIF sponsors and hosts a Professional Development Session at CDEMA's annual Comprehensive Disaster Management (CDM) Conference. CCRIF's recently-announced program for scholarships in the fields of insurance and disaster risk management falls under this budget line.

Overall Spending

CCRIF's overall spending has increased from 4.8 percent in 2007–2008 to 5.8 percent 2008–2009, and to an expected 7.2 percent of premiums in 2009–2010, as it has over that period incorporated research and development and, more recently, outreach and technical assistance activities into its agenda. Moving budget for these activities out of the operational budget to other, more specific budget lines has provided a clearer picture of CCRIF's core operational and administrative expenses, which have remained within the 5 percent guideline for such expenditures.

The Board is cognizant of the importance of controlling expenditures in order to ensure appropriate stewardship of CCRIF's resources, even though it has no guideline for total expenses. Thus, the Board decided to limit funding of the broad mandate and outreach budget initially to \$350,000. This comprised \$100,000 for ad hoc contributions to local initiatives such as existing insurance industry scholarship funds and charitable activities and a further \$250,000 to fund five long-term scholarships in the areas of insurance, risk management, or natural hazards. As a parameter for the longer term, the Board decided that a maximum of 50 percent of earned investment income could be designated for this budget line, a figure to be reviewed annually. Finally, the Board requested the Facility Supervisor to present specific recommendations for use of these funds and its communications firm to solicit feedback and ideas from both donors and participating countries in that regard.³³

5.9 Recommendations

Communications with Member Countries

- *CCRIF should articulate and publish for consultation its key principles regarding rate setting; expenditure control, including with respect to technical assistance, charitable and broad outreach activities; reserves accumulation; and the stability or*

³³ The Facility Supervisor presented a strategy and detailed budget to the Board at its December 2009 meeting, but feedback has yet to be obtained from CCRIF members and the supporting donors.

Table 5.8: Overall Spending

	2009/10 (Budget)		2008/09 Actual		2007/08 Actual	
Premium income	21,488,509	100.00%	21,838,512	100.00%	19,488,512	100.00%
TOTAL Expense budget	1,556,308	7.24%	1,276,171	5.84%	966,060	4.96%
TOTAL Operational/administrative	1,028,058	4.78%	1,072,810	4.91%	966,060	4.96%
TOTAL R&D	335,250	1.56%	203,361	0.93%	—	—
TOTAL Broad mandate	193,000	0.90%	—	—	—	—
TOTAL Operational/administrative	1,028,058	4.78%	1,072,810	4.91%	966,060	4.96%
Facility supervisor	455,000	2.12%	420,810	1.93%	402,755	2.07%
Board fees and expenses	192,750	0.90%	231,411	1.06%	163,072	0.84%
Insurance manager	102,000	0.47%	101,400	0.46%	66,251	0.34%
Communications and strategy planning	90,000	0.42%	110,349	0.51%	62,251	0.32%
Audit fees (inc. actuarial)	79,000	0.37%	45,874	0.21%	58,500	0.30%
Trust fees	38,833	0.18%	43,000	0.20%	98,725	0.51%
Directors & officers insurance	35,000	0.16%	31,775	0.15%	—	—
Real-time hazard monitoring	15,000	0.07%	75,000	0.34%	—	—
Legal fees	10,000	0.05%	2,898	0.01%	12,245	0.06%

(continued on next page)

Table 5.8: Overall Spending (continued)

	2009/10 (Budget)		2008/09 Actual		2007/08 Actual	
Regulatory fees	9,975	0.05%	9,719	0.04%	16,591	0.09%
Bank charges	500	0.00%	574	0.00%	695	0.00%
Product development	—	—	—	—	77,350	0.40%
Placement broker	—	—	—	—	7,625	0.04%
TOTAL R&D	335,250	1.56%	203,361	0.93%	—	—
KAC HLEM	120,000	0.56%	104,978	0.48%	—	—
Work under MOUs	70,000	0.33%	10,883	0.05%	—	—
Facility supervisor	69,000	0.32%	77,500	0.35%	—	—
Board fees and expenses	46,250	0.22%	—	—	—	—
Legal fees	30,000	0.14%	—	—	—	—
General R&D	—	—	10,000	0.05%	—	—
TOTAL Broad mandate	193,000	0.90%	—	—	—	—
Real-time hazard impact	120,000	0.56%	—	—	—	—
Outreach events/support	53,000	0.25%	—	—	—	—
Facility supervisor	20,000	0.09%	—	—	—	—

variability of premium rates and levels. This latter should include how the premium rate may be affected by changes in CCRIF's claims history and in the insurance cycle.

- *CCRIF should continue its efforts to improve participating countries' understanding of the value and nature of its operations* to mitigate the risk that members' current fiscal constraints may induce withdrawals which would reduce the benefits of risk pooling. These efforts should extend beyond those directly involved in the decision whether to purchase CCRIF insurance to build understanding within other domestic constituencies, such as national disaster management agencies and meteorological institutes.
- *As part of its efforts to enhance communications with its members, CCRIF should look for more frequent opportunities for workshops*, such as is being planned to introduce the new excess rainfall coverage, to share lessons learned regarding the role that CCRIF coverage can play in overall disaster risk reduction strategies.

Technical Assistance and "Broad Mandate" Budget

- *CCRIF should seek feedback from key stakeholders (including donors and participating countries) on its technical assistance and broad outreach activities* to ensure that they are demand-driven. Such feedback might be sought during discussions with members regarding renewal or changes in their coverage for the 2010–2011 season.
- *During consultations on possible technical assistance activities, CCRIF should explore, inter alia, its members' interest in support for developing, implementing, and enforcing modern, disaster-resilient building codes.*

Actuarial Review

- *CCRIF should commission a periodic Statement of Actuarial Opinion (SAO) on its solvency position and an annual or biannual actuarial report on its risk management strategy.*
- *CCRIF should continue work to use the DFA model to develop dynamic strategies that describe how premiums and reinsurance might need to vary according to different future conditions such as the level of CCRIF's reserves and reinsurance market conditions.*

Reinsurance and Pricing

- *CCRIF should assist its members to think through how best to benefit from changes in the premium rate*, whether by increasing their coverage or by reducing their premium amount.
- *CCRIF should consider a further refinement in its pricing policy and whether its reserves are now at a level that would support higher risk retention and/or a further reduction of the premium multiple.*

Investment Management

- *CCRIF should consider readjusting its investment policy to match asset and liability maturities better and facilitate investing in less liquid assets that could give a higher return.*

6. Governance Structure

6.1 Description

CCRIF was established in May 2007, as an exempted company incorporated under the laws of the Cayman Islands.³⁴ CCRIF holds a Class B insurance license under the Insurance Law (as revised).³⁵ The CCRIF STAR Trust (Trust) is governed by a Trust Deed and is administered by a Trustee. The sole purpose of the CCRIF Trust is to own 100 percent of the Facility, and the main purpose of the Facility is to provide catastrophe insurance coverage to participating countries, which are the beneficiaries of the Trust. An Enforcer was appointed and oversees the Trust.³⁶

CCRIF is governed by a Board of Directors, with no more than five Directors holding office at any time.³⁷ Directors must be acceptable to the Cayman Islands Monetary Authority (CIMA), which is CCRIF's regulator. The Trust Deed provides for the Board of Directors to be appointed by the Trustee, two on written instructions from the Secretary General of CARICOM and two on written instructions from the President of the CDB.³⁸ These Directors represent the participating countries and the donors, respectively. CCRIF's Operations Manual further specifies that two of the Directors, approved by both CARICOM and the CDB, should have specialized expertise, one in insurance and the other in finance, and notes that, while not mandatory, it is desirable for one of the Directors to be a Cayman Islands resident. The four Directors are appointed for three-year terms and may serve no more than two consecutive terms. The Articles of Association provide that the four Directors appointed in this fashion may select

34 Companies Law (2004 Revision). CCRIF's Articles of Association, pursuant to that Law, were adopted on May 11, 2007.

35 Cayman Islands Special Trusts (Alternative Regime) Law, 1997.

36 The CCRIF STAR Trust, Declaration of Trust made May 16, 2007, with Q & H Corporate Services, Ltd., as the Original Trustee, acknowledged by Mr. Richard Carpenter in his capacity as Enforcer.

37 Articles of Association, paragraph 74, page 16.

38 Trust Deed, Schedule 3(ii)(B), page 15.

an Executive Chairman to perform the functions and for the period of time that they determine.³⁹

The Trust Deed also appointed an Enforcer. Broadly put, the Enforcer has the duty of overseeing the proper execution of the Trust and resolving, including through legal proceedings, if necessary, any conflicts between CCRIF's operations and the Trust Deed. The Enforcer or the Secretary General of CARICOM may appoint an Enforcer, and the Secretary General has the power to remove the Enforcer.⁴⁰

The Directors' duties are established under the Cayman Islands Corporate Law and further specified in the CCRIF Operations Manual. The OM also establishes a code of ethics for the Board, as well as for service providers. In fulfilling their duties, the Directors meet in person at least twice annually and more frequently, whether in person or by telephone or video conference, at their discretion. As specified in the OM, the Directors approve the:

- long-range Strategic Plan;
- annual business plan;
- guidelines and performance measures for each contractor, reviewing the performance of the Facility Supervisor and Insurance Manager annually;
- financial structure, risk management and reinsurance plan;
- new products and services;
- annual budget;
- investment guidelines;
- annual audited financial statements; and
- public relations guidelines and communications plan.

CCRIF's financial statements are audited annually by an independent external auditor, as required by Cayman law and the CCRIF establishment documents. Audits are prepared according to US Generally Accepted Accounting Principles (GAAP).

6.2 Performance

Governance of the CCRIF has presented particular challenges, as it is the first joint reserve mechanism of its kind. The Facility is an independent entity which, while a non-profit company, functions in many aspects like a private sector entity to ensure both its financial sustainability and its value to its clients. Further, despite the private sector aspects of CCRIF's operations, the source of its income and reserves is public, deriving entirely from contributions from donors and the participation fees and premiums paid by the governments of the participating countries, which are the beneficiaries of the CCRIF Trust.

³⁹ Articles of Association, paragraph 101, page 22.

⁴⁰ Trust Deed, Section 8, pages 4 and 5.

CCRIF must strike a balance between its nature as an independent entity offering a financially viable and high value service to its members and the particular fiduciary duty it has to the governments, and their taxpayers, which have provided its funding. Thus, CCRIF must balance its need for maximum flexibility to promote efficiency and innovation, with its need for structured processes, strict internal controls and reporting procedures, and due regard to the policy implications of its decisions and activities.

The core issues associated with operating this new innovative Facility have been addressed and this is no small achievement. The Board has met quarterly since the establishment of the CCRIF, either in person or via teleconference, and all Board members have attended, with one or two exceptions due to unavoidable circumstances. The World Bank has participated as an observer. The Board, with active participation of all of its members, has been fulfilling all of its functions as described above. The Insurance Manager has prepared detailed minutes of each Board meeting to document the Board's decisions, which the Board reviews and approves and the Insurance Manager files. Internal controls have been strengthened, with improvements in the contracting and payments processes. The OM has undergone a further round of revisions and up-dates to clarify roles, responsibilities, and procedures, including those of the Board, with a view to continuing to use it, with periodic up-dates as necessary, to guide CCRIF's operations following expiry of donor funding. CCRIF's external auditor has issued clean letters of opinion regarding CCRIF's financial statements for both seasons.

The current members of Board of Directors combine extensive experience and expertise, including in the Caribbean, in catastrophe insurance, finance, banking, and insurance regulation, underwriting, and broking. In order to expedite CCRIF's establishment and entry into operation in May 2007, the Jamaica Social Investment Fund (JSIF), which had administered the donor grant that funded the analytical and other preparatory work leading up to CCRIF's establishment, appointed, through an exceptional process, the first three Directors, including the Executive Chairman. These three, of which two are long-term residents of the Caribbean, were selected for their experience and expertise in catastrophe risk insurance, insurance regulation, broking, and underwriting, banking, anti-fraud and money laundering, and internal audit. Two additional Directors, both of Caribbean origin, were appointed in January 2008 by the CDB and CARICOM, one representing the donors and the other the participating countries. With distinguished careers in the Caribbean, each of them also brought to the Board substantial experience and expertise in finance, insurance, banking, economics, and corporate planning, as well as more direct experience in interacting with the finance ministries of CCRIF's participants.

With CCRIF well on its way to consolidating its operations, a transition toward a Board composed entirely of members appointed in accordance with the provisions of the Trust Deed was planned for completion by the end of the 2008/09 season.⁴¹ These provisions recognize the importance of CCRIF's being seen as a Caribbean institution

41 Completing this transition was one of the main recommendations of the "Review of the CCRIF's Operation after Its First Season"; the World Bank, December 1, 2008; page 40.

and fully “owned” by its participating members, which are the Trust’s beneficiaries, and of its continuing to enjoy the recognition and support of the donors whose contributions have played a vital role in CCRIF’s successful start up and operations. This transition was to have been effected by seeking either appointment of two new Directors with specialized expertise in insurance and finance by the participating governments through CARICOM and the donors through the CDB or by reappointing the two existing Board members with that specialized expertise, if requested by CARICOM and the CDB.

As of December 2009, the transition, which the current Board has undertaken to complete, remained unfinished. This has highlighted a number of issues and challenges which CCRIF will have to confront as it continues to strengthen its governance and, more broadly, its standing as a Caribbean institution.

- ***Engaging Participating Countries:*** Although the composition of the Board and process for selection and replacement of Board members is set out in the OM, as well as in its legal documents, these processes are not widely known within CCRIF’s participating countries, just as they are not well known among the donors or within CARICOM.
- ***Engaging CARICOM:*** All of CCRIF’s participating countries are members or associate members of CARICOM and, thus, the institution provides an ideal forum for taking collective decisions on matters of interest to CCRIF’s members. As of December 2009, however, CARICOM had not responded to the Director that it appointed in 2008 regarding his request to contact CARICOM Members and Associate Members to solicit nominations for a new Director with insurance expertise, or to endorse the incumbent Director originally appointed by JSIF. Moreover, after more than a year, CARICOM had not responded definitively to an inquiry from CCRIF’s Executive Chairman regarding appointing an Enforcer, perhaps the CARICOM General Counsel, to replace the current Enforcer, who was appointed on an interim basis.⁴²
- ***Engaging the Donors:*** As of December 2009, donors had not responded to letters or personal contacts from the current Board member who represents them, either with nominations for a new Director with financial expertise, or to endorse the incumbent Director originally appointed by JSIF.

It will be important for the Board to ensure both that it continues to have the mix of expertise necessary to oversee CCRIF’s operations and that it fully understands and is responsive to the concerns of CCRIF’s members and donors. The quality of and mix of skills represented on the Board are important, given the Board’s responsibility for all strategic, product, and critical operational decisions. As time has progressed and CCRIF’s services and activities have begun to evolve and expand, the need for other types of expertise, such as actuarial, legal, and meteorological, has become apparent.

⁴² A recent informal communication from the CARICOM Secretary General suggests he is considering proposing an alternative to the General Counsel.

Retaining specialized expertise on a contractual basis has been effective to date and has kept CCRIF lean, but at some point it might be useful to bring new types of specialized expertise, such as actuarial, onto the Board itself. The largely public sources of CCRIF's income and reserves will also continue to impose a particular duty of care in directing CCRIF's services and operations.

6.3 Recommendations

The Board of Directors has navigated uncharted waters to launch CCRIF and ensure its successful passage through two, now going on three, successful seasons. As it seeks to strengthen further its governance structure, the Board should:

- **redouble efforts to complete the Board transition** to a membership constituted as envisioned in the provisions of the Trust Deed;
- **consider the merits of transitioning the post of Executive Chairman to a full-time position**, for example whether this could allow for a better balance of representational responsibilities between the Board and significantly step up the CCRIF's direct contacts with participating countries, CARICOM, and donors, strengthening appreciation of its value as a regional institution.
- **make concerted efforts to strengthen CCRIF's relationship with CARICOM**, perhaps by enlisting the direct support of COFAP (the CARICOM Council of Finance and Planning Ministers) or by involving some of the participating countries, particularly those that have received payouts; and
- **consider increasing CCRIF's transparency**, not only through its ramped up communications strategy and the publication of its key principles, as already recommended, but also by making the minutes of its Board of Directors meetings publicly available.

7. Interactions with Stakeholders

7.1 Overview

As a new institution offering innovative catastrophe insurance, CCRIF has faced the challenge of establishing relationships and close communications with its members, donors, financial markets, and other stakeholders, including specialized regional institutions. The “Review of CCRIF’s Operations After its First Season” recognized CCRIF’s progress in this regard. In line with one of the Review’s key recommendations, CCRIF endeavored during its second year of operations to deepen its relationships with its members’ ministries of finance and planning, regional representatives of donors to the CCRIF, financial market actors providing services to the CCRIF, and partner institutions.

Strengthening stakeholder communications remains one of the Board’s priorities in light of the continuing need to increase understanding of CCRIF’s character as a joint reserve mechanism and the parametric nature of its coverage. The Board laid the foundation for doing so by tendering for and, in June 2009, contracting with a new corporate communications services provider, Sustainability Managers. In September 2009, the Board adopted SM’s proposed communications strategy and plan, which is already being vigorously implemented.⁴³

Direct and targeted outreach to government officials of CCRIF’s Members will be important to supplement enhanced communications through the media, CCRIF’s website, and the publication of periodic reports, news bulletins, and newsletters, which are being disseminated to an increasingly diverse audience. Although this review did not conduct a systematic survey of member officials’ awareness of CCRIF and understanding

43 Sustainability Managers has begun revamping CCRIF’s web page (www.ccrif.org) and is stepping up the volume and frequency of information that is available on it, such as CCRIF’s Annual Report for 2008–2009, Quarterly Reports, news releases, and other information about CCRIF and its activities. There is evidence that use of the website, including by persons in the Caribbean, is increasing rapidly. This evidence provides a baseline that will be useful in assessing the effectiveness of CCRIF’s growing public outreach efforts.

of the nature of its coverage, a theme that consistently surfaced during the review was the need to build CCRIF's transparency and knowledge of its policies and activities. It would be beneficial to expand systematically the participation of key personnel of the members' disaster risk reduction and emergency response agencies and meteorological institutes in the Facility's outreach activities. A key message in CCRIF's outreach will continue to be that CCRIF's coverage supports, but cannot replace, the members' broader disaster risk reduction and management efforts, including through the adoption, implementation, and enforcement of disaster-resilient building codes.⁴⁴

7.2 CCRIF Members

CCRIF's principal direct interaction with its members is during the policy renewal discussions. These discussions typically begin in February and end with signature of the policy and payment of the premium, which should occur prior to end-May and the commencement of the new season. Before the beginning of the 2009/10 season, the Facility Supervisor and the Executive Chairman visited CCRIF participants to meet with decision-makers in the Ministries of Finance and Planning to discuss policy conditions and costs for the coming season. In some cases, the possibility of CDB or other donor support for their premium payments was also a topic of discussion.

Direct interactions also take place after the occurrence of a catastrophe event with the potential to trigger a payout, whether to arrange a payout or to respond to a member's request for clarification in the case of an event that caused damage but did not trigger a payout. During the 2008–2009 season, the Facility Supervisor prepared and circulated a timely briefing to CCRIF members for each hurricane and earthquake event that had the potential to trigger a payout, also posting these briefings on the CCRIF website. Following Hurricane Ike, the Facility Supervisor worked closely with the authorities of the Turks and Caicos Islands to make arrangements for it to receive its full US\$6.3 million payout within 3 weeks of having been struck by the Hurricane, well within the period specified in CCRIF policies for payouts.⁴⁵ The Facility Supervisor also responded to The Bahamas' requests for an explanation of why Hurricane Ike, which passed directly over Grand Inagua, had not triggered a payout from its hurricane policy and to the Government of the Cayman Islands regarding Hurricane Paloma (see Chapter 3, Section 3.2).

Persons interviewed for this review consistently expressed the need to increase CCRIF's transparency. Matters of particular interest included the operation of CCRIF's

44 The only two undamaged schools on Grenada following Hurricane Ivan had been constructed in accordance with a disaster-resilient building code.

45 CCRIF's standard policy conditions provide that the index calculation shall be made within 14 calendar days following the time at which the hurricane passes closest to the first measurement point in the Insured's country. Assuming that the calculated index value is high enough to trigger a payout, the payout is to be made within 14 business days following the index calculation, although CCRIF has the discretion to delay payment to not more than 90 days following receipt of the Insured's claim. Business days are defined as days on which banks in the Cayman Islands are open for regular business.

loss model, the pricing of its coverage, the procedure for constituting its Board, and the most opportune procedures for expressing to the Board their interests and concerns about issues such as the scope and pricing of CCRIF's coverage.

CCRIF also interacts with its members' officials in regional and other fora and in workshops and the like hosted by regional partners, such as CDERA, sometimes with CCRIF's financial support. Among these events, the Professional Development Session at the annual Caribbean Conference on Comprehensive Disaster Management is particularly important, as it is specifically geared to building understanding of disaster risk mitigation and management specialists regarding CCRIF and its value added. The December 2009 PDS was attended by 70 persons. CCRIF might seek opportunities for similar events, which might be organized in conjunction with other events such as the CDB's annual meeting or meetings of CARICOM members' officials, such as COFAP and tailored in terms of duration and content to specific the needs of the intended audience.

7.3 Donors

During the 2008/09 season, CCRIF continued efforts to keep representatives of the donor community located in the Caribbean informed of its activities through dissemination of CCRIF's event briefs, Quarterly and Annual Reports, and news releases. It is an advantage that CaribRM, which serves as Facility Supervisor, has an office in Barbados, where many donors have their own representation, and that personnel of this office are, as several donors mentioned, readily accessible to them.

Sustaining donors' engagement remains a challenge. One donor agency interviewed indicated a desire to become more informed and involved. Militating against such involvement, however, is the small size of the donors' local offices, their periodic staff turnover, and their focus on other development needs that they may see to be more direct, immediate, and within their comparative advantage. The local donor officials interviewed in Barbados were generally not aware that the CCRIF Board member representing the donors had written to advise that the term of two of the Directors was coming to an end and to request nominations for a new Board member.

Donor representatives interviewed expressed concern about the financial sustainability of the CCRIF model. They noted some participating countries' fiscal constraints and consequent recourse to donor or CDB finance to assist in the payment of their premiums and questioned whether all CCRIF members would renew policies for the 2010–2011 season, particularly as the first two seasons of CCRIF's operations had not resulted in significant payouts. One noted that this question had particular significance, as CCRIF was being considered as a prototype for similar facilities in other regions.

The World Bank continues to manage interaction with donors as regards their contributions to CCRIF. Donor contributions have been channeled through the MDTE, administered by the World Bank. During the 2008/2009 season, the EU made a contribution to CCRIF in the amount of approximately US\$16 million, bringing total contributions from bilateral donors, the CDB, and the World Bank to approximately \$67.4 million.

7.4 Financial Markets

CCRIF is well accepted in the reinsurance markets, but continued close dialogue is important. The first two successful seasons built knowledge of and confidence in CCRIF and the third season has seen a continuation of this trend. CCRIF's financial strength and efficient operation have provided assurance to the Facility's reinsurance partners. With the help of its reinsurance broker, which manages CCRIF's relations with reinsurers, CCRIF has been able to increase the number of its reinsurers for its third season from four to five. A close dialogue will continue to be required as CCRIF seeks to transition to its second-generation loss model and introduce new products.

7.5 Specialized Partner Institutions

CCRIF works with a number of specialized partner institutions both to make use of their expertise and resources to support CCRIF's provision of coverage, as well as to advance the wider disaster risk management agenda in the region. CCRIF has recently been formalizing these partnerships through the signing of MOUs, described in more detail below.

Wider collaboration between CCRIF and the agencies of its member countries involved in disaster management would further complement these partnerships. Understanding of CCRIF among parts of the wider disaster risk management community, including the members' own national disaster risk reduction and management agencies, remains weak. As noted above, such collaboration could broaden understanding of the role that CCRIF, as a joint reserve facility, can play in the members' overall disaster management plans.

The Caribbean Community (CARICOM)

Relations with CARICOM are particularly important. CARICOM has considerable stature as an institution that represents all of CCRIF's members. It put the original request to the World Bank in 2004 to develop a mechanism for catastrophe risk insurance for its Members and Associate Members. Moreover, the Trust Deed assigns it significant powers with respect to CCRIF's governance structure. As indicated in Chapter 6, CARICOM has the authority to appoint (or remove) CCRIF's Enforcer, as well as to instruct the appointment of members of its Board of Directors. CCRIF has sought to engage CARICOM by suggesting that the two sign an MOU, but this initiative stalled and, as of December 2009, the effort to obtain nominations for the position of the Board Director with specialized insurance expertise had not gotten off the ground. Continued efforts to engage CARICOM are essential.

The Caribbean Disaster Emergency Response Agency

CCRIF initiated discussions of a MOU with the Caribbean Disaster Emergency Response Agency (CDERA) in 2008–2009 and this MOU was signed in August 2009. CDERA has the mandate to coordinate disaster management for the English-speaking

Caribbean. It leads implementation of the Comprehensive Disaster Management (CDM) Strategy and Framework and coordinates the annual CDM conference. Under the MOU, CCRIF will join CDERA in supporting the Professional Development Session of the CDM conference and also will supply CDERA with real-time hazard information via the Caribbean Institute of Meteorology and Hydrology (CIMH).

The Caribbean Institute of Meteorology and Hydrology

CCRIF also signed an MOU with CIMH which is the premier training and research institution for meteorology and hydrology in the English-speaking Caribbean. Under the MOU, CIMH is to: (i) support CCRIF's research into catastrophe risk and new products; (ii) develop independent networks for meteorological measurements; (iii) analyze the aftermath of hazard events; and (iv) act as interface between CCRIF and other parties on technical issues. In particular CIMH supports CCRIF's contract with Kinetic Analysis Corporation to develop an excess rainfall product and provide participating countries with real-time information on tropical cyclones. Modalities for developing the independent measurement networks are yet to be established.

The University of the West Indies

CCRIF is finalizing an MOU with the Disaster Risk Reduction Centre (DRRC) of the University of the West Indies (UWI). DRRC undertakes research to support the management and mitigation of risk in the Caribbean. Under the MOU, CCRIF and UWI will work together to use CCRIF's loss models to improve risk-modeling within DRRC and the wider risk-management community. CCRIF will also support the UWI's MSc Disaster Management course as well as the University's work to develop the Risk Atlas of natural hazards risk within the Caribbean, for which it has received a grant from the Global Facility for Disaster Reduction and Recovery, a World Bank-administered multi-donor trust fund.

7.6 Recommendations

The Board has addressed the majority of the recommendations set out in the review of CCRIF's first season of operations regarding stakeholder relationships. Implementation of the Communications Plan, approved in September 2009, should further strengthen relations.

In addition, the Board should consider:

- *continuing to expand CCRIF's stakeholder relationships in the participating countries* by further engaging disaster risk management and meteorological specialists, as well as officials from ministries of finance and planning, to improve CCRIF's transparency and increase understanding of its vital role as an element of broader disaster risk management plans; and

- *creating more structured opportunities for the Directors to meet with representatives of participating governments and donors* to share lessons learned from CCRIF's operations to date and to discuss and get feedback regarding changes in CCRIF's modeling tools and coverage, pricing methodology, governance structure, and strategic directions.

8. Innovations

8.1 Second-Generation Loss Model

CCRIF continued its work during the 2008–2009 season to develop and test a second-generation loss modeling framework. The model is being developed by Kinetic Analysis Corporation (KAC) under the direction of the Facility Supervisor and is being tested with the reinsurance community. It is intended to replace the EQECAT first-generation parametric model that has underpinned CCRIF policies during its first three seasons.

The second-generation model is expected to refine CCRIF's policies and their pricing. Well-documented and transparent, it incorporates recent scientific advances in hazard and loss modeling and is expected to be highly scalable and applicable at a wide range of modeling resolutions. This should enable tailoring CCRIF's hurricane and earthquake insurance coverage more closely its members' individual needs. An important outcome of greater customization should be the reduction of basis risk, which occurs when an insurance payout does not exactly match the actual loss. After some experience is gained with the second-generation model, it could also eventually facilitate lowering the attachment point on CCRIF's hurricane policies to one in ten year events, thus enhancing CCRIF's function as a joint reserve mechanism.

It is hoped that the second-generation loss model will be ready for use in writing policies for CCRIF's fourth, 2010–2011 season, beginning June 1, 2010. The Facility Supervisor and KAC received positive feedback from reinsurers at a meeting in February 2009. CCRIF is planning a road show with the reinsurance broker in early 2010 to meet with major reinsurance companies, review the differences between the first- and second-generation models, and confirm the latter's market acceptability.

8.2 Excess Rainfall Coverage

The Facility Supervisor also continued work funded by CCRIF to develop an excess rainfall product and the Board expects to be able to begin offering the coverage for the 2010–2011 season.⁴⁶ Such a product would be of considerable interest to some CCRIF members as well as to some CARICOM members—notably Guyana and Surinam—which are not yet CCRIF members. The work is being carried out in collaboration with KAC and CIMH. Rainfall is perhaps the most difficult area of weather and climate modeling and there exists no scientific consensus on a methodology to underpin excess rainfall coverage. Initiating the project during the 2008–2009 season and continuing into the 2009–2010 policy year, KAC tested three extant methodologies, building on them to develop and begin vetting with the reinsurance community a refined methodology. KAC and CIMH also continued during the 2009–2010 season their work to develop a large 50-year database of rainfall from which the necessary climatology of extremes can be extracted and used to operationalize the methodology that will underpin the excess rainfall contracts.

8.3 Caribbean Association of Electrical Utilities

CCRIF continued work to develop a product to provide catastrophe coverage for power companies forming the CARILEC. The coverage would be offered through a separate captive insurance company independent of CCRIF's current operations. A number of questions remain to be resolved. First, while the suggestion for such a product came from CARILEC, the actual interest of its member utilities has not yet been ascertained. Other important questions also remain to be resolved, including how the facility would be capitalized and what its governance structure should be.

8.4 Recommendations

The Board should consider:

- *employing a professional technical writer on a short-term contract* to work with the Facility Supervisor, the Reinsurance Broker and, as necessary, an actuary to develop materials for distribution to member country officials, partner institutions, donors, and other relevant stakeholders to articulate the differences between the first- and second-generation loss models and explain the excess rainfall product; and
- *undertaking a broader expert elicitation across top research institutions for the development of any further new products*, while recognizing that R&D may not always lead to a new product, as there may be insufficient data to realize them.

⁴⁶ A workshop was planned for January 2010 to introduce the excess rainfall product and, also, provide an up-date on the second-generation model to be used for hurricane and earthquake coverage. The workshop was postponed until February given the need for CCRIF, countries in the region, and other partners to focus fully on requirements for Haiti's relief and recovery.

Annex A: Documents Reviewed

1. Memorandum and Articles of Association of Caribbean Catastrophe Risk Insurance Facility; Turner and Roulstone; adopted by special resolution, May 11, 2007.
2. The CCRIF STAR Trust Deed; Turner and Roulstone; May 16, 2007.
3. The Grant Agreement between CCRIF and the World Bank as Trustee of the Multi-donor Trust Fund; April 26, 2007; and amendment thereto, November 10, 2008.
4. CCRIF Board Discussion Document – Governance of CCRIF: Requirements for the Permanent Board Structure; April 2008.
5. Summary of the Duties of a Director under the Law of the Cayman Islands; note by Maples and Calder; July 2003.
6. Statement of Guidance: Corporate Governance; Cayman Islands Monetary Authority; undated.
7. Minutes of CCRIF Board of Directors Meetings: January 5, 2008; April 9, 2008; December 1, 2008; March 10, 2009; June 23, 2009; September 11, 2009; December 15, 2009.
8. CCRIF Strategic Plan 2009/10 to 2011/12; February 2009.
9. CCRIF Investment Guidelines.
10. CCRIF Communications Plan, August 2009.
11. CCRIF Strategy on Climate Change: Summary of Recent Activities and Recommendations for Continued Engagement, September 2009.
12. Technical Assistance Programme – Recommendations for Structure, Operations and Budget; December 4, 2009.
13. CCRIF Budgets: 2007–2008 (actual), 2008–2009 (actual), and 2009–2010 (planned).
14. CCRIF Audited Financial Statement and PriceWaterhouseCoopers Management Letters for 2007–2008 and 2008–2009.
15. CCRIF Annual Reports 2007–2008 and 2008–2009.
16. CCRIF Operations Manual, drafts and version adopted, December 2009.
17. “A Review of the CCRIF’s Operations After Its First Season”; World Bank; December 1, 2008

18. Memorandum of Understanding between the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Caribbean Institute for Meteorology and Hydrology (CIMH); October 27, 2008.
19. Memorandum of Understanding for the Implementation of a Collaborative Partnership between: The Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Caribbean Disaster Emergency Response Agency (CDERA); August 19, 2009.
20. Draft Memorandum of Understanding for the Formalisation of a Collaborative Relationship between: The Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Caribbean Community (CARICOM); March 19, 2009.
21. Draft Memorandum of Understanding for the Implementation of a Collaborative Partnership between: The Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the University of the West Indies Disaster Risk Reduction Center (UWI-DRRC); July 14, 2009.
22. Draft Memorandum of Understanding for the Implementation of a Collaborative Partnership between: The Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC); December 11, 2009.
23. Sample CCRIF Catastrophe Risk Coverage Documents for 2009–2010 insurance year: Policy Document (Parametric Insurance Contract), Policy Terms and Conditions, Claims Procedure, and Claims Verification.
24. 2009–2010 Reinsurance Agreement
25. CCRIF Investment Structure Chart.
26. Various CCRIF Quarterly Reports and news bulletins.
27. Various Quarterly Reports by London & Capital Asset Managers, Ltd.
28. Various reports by Kinetic Analysis Corporation of status of development of excess rainfall product.
29. Contracts for Insurance Supervisor, Communications Consultant, Facility Supervisor, Executive Chairman.

Annex B: Persons Interviewed

CCRIF Board of Directors

- Milo Pearson, Executive Chairman, Board of Directors
- Isaac Anthony, Director
- Ken Blakeley, Director
- Warren Smith, Director
- Garry Wilkins, Director

CCRIF Consultants and Service Providers

- Andrew Coyle, Andrea French, and Paul Thorogood, reinsurance brokers, Aon Benfield
- Simon Young, CCRIF Facility Manager, and Martin Goddard and Ekhosuehi Inyahun, CaribRM
- James Rawcliffe, CCRIF Insurance Manager, Sagicor Insurance Managers, Ltd.
- William Dalziel and Craig Shute, Investment Managers, London & Capital Asset Managers, Ltd.
- Jan Vermieren, CEO, Kinetic Analysis Corporation

George Town, Grand Cayman

- Charles Bolland and Satyajeet Beekarry, PriceWaterhouseCoopers
- Ruwan Jayasekera and Dwight Merren, Chief Analysts, Insurance Supervision Division; and Bill Hagan, Chief Analyst, Insurance Division; Cayman Islands Monetary Authority

Kingston, Jamaica

- Dr. David Smith, Director, Disaster Risk Reduction Center, University of the West Indies
- Richard Murray and Marlin Morgan, Ministry of Finance

Bridgetown, Barbados

- Jeremy Collymore, Coordinator, CDERA
- Tony Gibbs, Consulting Engineers Partnership, Ltd.
- Harry Hagan, Head of DFID in the Caribbean and CDB Executive Director for UK
- Hubert Perr, Counselor and Head of Operations, and Brian Moody, Attaché and Project Officer (Infrastructure) Officer; EU Mission
- Carlos Belgrave, Supervisor of Insurance and Pensions, Ministry of Finance, Economic Affairs, Development and Energy
- Roger Bellers, DFID
- Dr. David Farrell, Principal, and Sean Boyce, Chief Hydrologist; Caribbean Institute for Meteorology and Hydrology

Nassau, The Bahamas

- Simon Wilson, Director of Economic Planning, Ministry of Finance
- Christine Thompson, Chief Economist, Ministry of Finance
- Trevor Basden, Senior Deputy Director, Department of Meteorology
- Chrystal Glington, First Assistant Secretary, and Michele Gardner, National Emergency Management Agency

Annex C: Audited Financial Statements 2008–2009

August 28, 2009

The Board of Directors
Caribbean Catastrophe Risk Insurance Facility
c/o Sagicor Insurance Company Ltd.
P.O. Box 2171
Grand Cayman KY1-11-5
Cayman Islands

Dear Sirs,

RE: Caribbean Catastrophe Risk Insurance Facility

Purpose and use: We have completed our audit of the May 31, 2009 consolidated financial statements of Caribbean Catastrophe Risk Insurance Facility and its subsidiary (the "Group" or "Facility") and have issued an unqualified opinion on those statements. Professional standards require that we communicate certain matters to those charged with governance of the Group. The following, which is intended solely for the use of the Board of Directors and management of the Group, is a summary of that information.

Auditor's responsibility under generally accepted auditing standards: Auditing standards generally accepted in the United States of America require that we plan and perform the audit to obtain reasonable, rather than absolute, assurance about whether the financial statements are free of material misstatement. An audit of financial statements is not designed to identify all matters that may be relevant to those charged with governance. Accordingly, the audit does not ordinarily identify all such matters and this report includes only those matters of a governance interest which came to our attention as a result of the performance of our audit.

Responsibilities of Management and those charged with governance: Management's responsibilities are detailed in the engagement letter to which this engagement was subject. The audit of the financial statements does not relieve management or those charged with governance of their responsibilities.

Other information in documents containing audited financial statements: While we have no responsibility to perform any audit work on other information, including forward looking statements, in documents containing audited financial statements, we will read the other information contained in the Group's annual report to stakeholders to consider whether such information is materially consistent with information appearing in the financial statements or our knowledge of the operations of the Group.

Cont'd..../2

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The Board of Directors
Caribbean Catastrophe Risk Insurance Facility
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General approach and overall scope of the audit: We applied a top-down, risk-based approach to planning and conducting the audit, through the application of well-reasoned professional judgment. We obtained an understanding of the Group's operations and the related risks, which drove our assessment of materiality and identification of audit risks, including key risks, which are audit risks that require special audit considerations. We also obtained an understanding of how management controls these risks, by considering management's approach to internal controls, and we determined how we will test significant account balances and classes of transactions.

Our audit approach was primarily substantive and included the testing, on sample basis, of significant transactions and balances.

Significant accounting practices: We are responsible for providing our views about qualitative aspects of the Group's significant accounting practices, including accounting policies, accounting estimates and financial statement disclosures. Generally accepted accounting principles provide for the Group to make accounting estimates and judgments about accounting policies and financial statement disclosures. We are not aware of any areas where the significant accounting practices have changed from previous year or are not consistent with general industry practice. In addition we are not aware of any new or controversial accounting practices reflected in the Group's financial statements.

Significant risks and exposures: Significant risks and exposures are disclosed in the financial statement footnotes.

Management's judgments and accounting estimates: There were no matters which required management to make significant judgments or which required significant estimates other than in respect of investment valuations as discussed in Notes 3 and 5 of the Group's consolidated financial statements.

Significant audit adjustments (both recorded and unrecorded): There were no significant audit adjustments either made or proposed to the consolidated financial statements.

Going concern doubts: As a result of our audit, we did not become aware of any material uncertainties related to events and conditions that may cast significant doubt on the entity's ability to continue as a going concern.

Material weaknesses in internal control: Matters relating to internal controls identified as part of our audit are outlined in Appendix 1 to this letter.

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Fraud or illegal acts: Applicable auditing standards recognize that the primary responsibility for the prevention and detection of fraud and compliance with applicable laws and regulations rests with both those charged with governance of the entity and with management. It is important that management, with the oversight of those charged with governance, place a strong emphasis on fraud prevention, and fraud deterrence. They are also responsible for establishing and maintaining controls pertaining to the entity's objective of preparing consolidated financial statements that are presented fairly, in all material respects, in accordance with the applicable financial reporting framework and managing risks that may give rise to material misstatements in those consolidated financial statements. In exercising oversight responsibility, those charged with governance should consider the potential for management override of controls or other inappropriate influence over the financial reporting process.

As auditors, in planning and performing the audit, we are required to reduce audit risk to an acceptably low level, including the risk of undetected misstatements in the financial statements due to fraud. However, we cannot obtain absolute assurance that material misstatements in the financial statements will be detected because of such factors as the use of judgment, the use of testing, the inherent limitations of internal control and the fact that much of the audit evidence available to the auditor is persuasive rather than conclusive in nature.

No fraud or illegal acts came to our attention as a result of our audit.

Disagreements with management: We have had no disagreements with management resulting from our audit.

Management representations: We requested that management provide us with certain representations. A copy of the letter that includes those representations is available upon request.

Audit report: We did not make any modifications to our audit report.

Other miscellaneous matters: We are not aware of any consultations between management and other auditors about audit and accounting matters. We have no questions regarding management integrity. No significant matters were discussed with management prior to our reappointment as auditors. No serious difficulties were encountered in the performance of our audit. We are not aware of any impairment to our independence as auditors.

Other engagement commitments: There were no other specific matters agreed upon in the terms of our engagement.

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If you would like to discuss the results of our audit or any other matters in further detail please feel free to call Charles Bolland or Satya Beekarry at (345) 949-7000.

This letter including any appendices is intended for the purpose and use set out above and should not be used for any other purpose or by any other party. It may not be made available to others without our consent.

Yours faithfully,

PriceWaterhouseCoopers

APPENDIX 1: MATTERS RELATING TO INTERNAL CONTROLS

In planning and performing our audit of the consolidated financial statements of Caribbean Catastrophe Risk Insurance Facility (the "Group") as of and for the year ended May 31, 2009, in accordance with auditing standards generally accepted in the United States of America, we considered its internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the consolidated financial statements, but not for the purpose of expressing an opinion on the effectiveness of internal control over financial reporting. Accordingly, we do not express an opinion on the Group's internal control over financial reporting.

Our consideration of internal control over financial reporting was for the limited purpose described in the preceding paragraph and was not designed to identify all deficiencies in internal control over financial reporting that might be significant deficiencies or material weaknesses and therefore, there can be no assurance that all deficiencies, significant deficiencies, or material weaknesses have been identified.

AU 325, Communicating Internal Control Related Matters Identified in an Audit, of the AICPA Professional Standards includes the following definitions of a deficiency, a significant deficiency and a material weakness:

Deficiency - a deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis.

Significant deficiency - a deficiency, or combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Material weakness - a deficiency, or combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis.

We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above.

However, we noted certain matters involving the system of internal control and its operation, and have appended for your consideration related observations and recommendations designed to help the Group improve the system of internal control.

This report is intended solely for the information and use of the board of directors and other management; it is not intended to be and should not be used by anyone other than these specified parties.

PwC observations and recommendations

Reconciliation of investments records: During our audit we noted differences (e.g cash balances, units held of some securities and valuation) between the records of the custodian and the fund administrator which were, however, below our threshold for reporting and/or adjustment. Such differences can accumulate over time and become a material difference. We understand there is currently no formal process to reconcile the records of its custodian and fund administrator. Such reconciliation would be a key control in ensuring that the investments of the Group are not materially misstated and would assist in the timely identification of discrepancies, if any. We recommend that management reconcile the records (i.e. cash balances, units held of each security and valuation) of their custodian and fund administrator on a periodic basis and resolve any differences on a timely basis. While small differences in valuation due to different pricing sources is expected, in addition to identifying significant pricing differences which may be due to errors, this control also ensures that the overall portfolio valuation between the custodian and the fund administrator is broadly consistent.

Management response

Management requested London & Capital Asset Management (the "Fund Manager") to provide a response to this point. Their response was as follows:

The Fund Manager reconcile BNP Paribas (the "Custodian") and Citibank (the "Fund Administrator") records during the Net Asset Values ("NAV") approval process. The Custodian, Fund Administrator and Fund Manager, each use different systems so this becomes a three-way reconciliation. The Fund Administrator reconcile with the Custodian on a monthly basis, while the Fund Manager reconcile stock monthly and cash daily with BNP Paribas. While the Fund Manager does not routinely reconcile direct with Citibank, inconsistencies come out in the monthly NAV calculation sign off process:-

1. The Fund Administrator send their NAV calculations for the Fund Manager to review at the end of each NAV cycle.
2. The Fund Manager compare the Fund Administrator's estimate of the NAV against the Fund Manager's independently calculated value using their internal portfolio management system ("Axys"). This highlights any significant differences. In practice a tolerance of +/-25bps is allowed for timing and settlement differences which will settle on their own over a few days.
3. If the difference between the Fund Manager's monthly estimate and the Fund Administrator's NAV calculation is greater than 25bps, the Fund Manager will examine in detail the Fund Administrator's holdings using Axys, to identify breaks in the reconciliation.

It is in the nature of Asset Management for small differences to exist in any given snapshot of the data. These are generally timing issues and are resolved within the monthly NAV cycle.

PwC observations and recommendations	Management response
<p><u>Formalization of arrangement with MDTF:</u> The Group has a contractual arrangement with the Multi-Donor Trust Fund (“MDTF”), whereby \$50 million is committed to the Group as contribution for certain of the Group’s expenditure, as defined in the contract. We noted that the MDTF has received and accumulated in excess of \$50 million prior to reimbursements to the Group. However, there is currently no contractual obligation for the MDTF to commit those excess funds to the Group. Further, we note that the initial Grant Agreement (the “Agreement”) between the MDTF and the Group has a time limit of 5 years from the start of the Agreement, beyond which funds in the MDTF will no longer be available to the Group. We understand that management are engaged in discussions with the MDTF representatives in order to reach an agreement to commit the excess funds to the Group and clarify that each separate donation to the MDTF is subject to a 5 year term limit, rather than the availability of all funds expiring 5 years after the date of the Agreement. We recommend management pursue discussions with representatives of the MDTF and accordingly, make amendments to the Agreement as soon as possible, to ensure that the excess funds are in fact accessible by the Group, if required, and the 5 year term limit applies to each separate donation into the MDTF.</p>	<p>Agreed</p>
<p><u>Expenses reimbursable from the MDTF:</u> During our audit, we noted that the Group was not claiming reimbursement for some expenses which it is eligible to claim according to the terms of the Agreement. We understand that the MDTF may impose certain conditions for such items of expenditure to become reimbursable. We recommend that management consider the benefits of claiming reimbursement for such expenses against the additional compliance cost that the MDTF may impose, and introduce a formal procedure whereby the Board of Directors reviews all expenditures of the Group to ensure they are satisfied that reimbursement has been sought from the MDTF wherever appropriate.</p>	<p>Agreed</p>

