

## **\*135 THE CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY: PARAMETRIC INSURANCE PAYOUTS WITHOUT PROPER PARAMETERS**

*The small island states of the Caribbean are highly exposed and extremely vulnerable to catastrophic weather events, especially hurricanes and earthquakes. During the one to six months following a serious hurricane or earthquake, after emergency funds have been exhausted and before donor pledges come in, Caribbean governments experience a “liquidity gap,” when their monetary resources fall far below what is required to provide essential governmental services and begin the recovery process. Established in 2007, the Caribbean Catastrophe Risk Insurance Facility (“CCRIF” or the “Facility”) offers a solution to the liquidity gap through the use of an innovative insurance scheme. This Article first engages in a background discussion of the Facility, reviewing why it was created, how it works, and what it has accomplished for its insureds since taking effect. It then examines the many facets of CCRIF that have earned it its good name--specifically, its efficiency, fairness, and attentiveness to Caribbean needs and interests. At the same time, the Article attempts to provide a more pragmatic critique than can be found in the existing literature by shedding light on a rather notable CCRIF flaw that has thus far received little recognition: the risk that the Facility’s insurance payouts are inaccurate. Finally, the Article considers the possible ramifications of this flaw and suggests a grassroots solution requiring the participation of the Caribbean people.*

### **TABLE OF CONTENTS**

INTRODUCTION	136
I. WHY CCRIF WAS CREATED	140
II. HOW CCRIF WORKS	141
III. WHAT CCRIF HAS DONE FOR ITS INSUREDS SINCE TAKING EFFECT	144
IV. CCRIF’S FIRST-CLASS REPUTATION	146
A. Efficiency	146

B. Fairness	146
C. Attentiveness to Caribbean Needs and Interests	147
V. CCRIF'S FORGOTTEN FLAW	149
VI. A SOLUTION	151
CONCLUSION	152

## \*136 INTRODUCTION

In this day and age, it is hard to credibly deny the reality of climate change. After all, experts overwhelmingly agree that “[w]arming of the climate system is *unequivocal* [ , as evidenced by] increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.”<sup>1</sup> They have noted discouraging trends in instances of extreme weather, including “more intense and longer droughts,” heightened “frequency of heavy precipitation events ... over most land areas,” and “an increase in intense tropical cyclone activity in the North Atlantic.”<sup>2</sup> They predict, with a high degree of confidence, that these trends will only amplify in the future.<sup>3</sup> Quite bleakly, they inform that even were it possible for humankind to cease current practices that exacerbate climate change, its past activities “will continue to contribute to warming and sea level rise for *more than a millennium*, due to the time scales required for removal of [carbon dioxide] from the atmosphere.”<sup>4</sup>

Unfortunately, those least responsible for climate change are those bearing the brunt of its costs. This is precisely the situation in which the small island states of the Caribbean find themselves. But before one can appreciate the challenges posed by impending climate change on the region, one must grasp the weather conditions with which it already copes. Due to their location, small geographic size, developing economies, and scant budgets, Caribbean nations are highly exposed and extremely vulnerable to catastrophic weather \*137 events, namely, hurricanes, earthquakes, and volcanoes.<sup>5</sup> The Caribbean Basin sits directly in the path of tropical storms and hurricanes forming in the common storm genesis zone of the Northern Atlantic Ocean. Not surprisingly, it is, on average, hit by a major hurricane every two and a half years.<sup>6</sup> Between 1979 and 2005, Caribbean countries cumulatively incurred \$613 million in damages annually, equaling \$16.6 billion for the entire period, as a result of tropical storms and hurricanes.<sup>7</sup> Between 1992 and 2002, Caribbean states collectively experienced over twenty-seven major natural disasters and accounted for ten of the fifty countries hardest hit by natural disasters, based on a measurement of economic damage as a percentage of gross domestic product (GDP).<sup>8</sup> Indeed, yearly expected loss in Caribbean nations attributable to present climate conditions ranges from 1 to 6 percent of GDP, with the high-end figure equivalent to the economic harm caused by a serious recession, minus the eventual revival.<sup>9</sup>

Unquestionably, climate change will exacerbate the Caribbean’s already dangerous exposure level. By 2030, it could lead to an additional 1 to 3 percent annual loss for Caribbean states, calculated as a percentage of GDP.<sup>10</sup> In other words, in just twenty years, weather-related losses may triple in the Caribbean.<sup>11</sup> More specifically, Northern Atlantic sea levels may rise by up to 15 millimeters per year, while hurricane winds may strengthen by roughly 5 percent.<sup>12</sup> Therefore, it is easy to perceive why experts warn that “[i]nvesting in \*138 adaptation initiatives that reduce the impact of climate change is absolutely essential for the future viability and sustainability of the economies of the Caribbean.”<sup>13</sup>

Like its tremendous exposure, the Caribbean’s vulnerability to extreme weather is also exceptional. The territory is made up of several developing island states, where development is largely concentrated on the coast.<sup>14</sup> The area’s predominant economic driver, tourism, hinges on the gorgeous Caribbean coasts, steering most of the native population to live nearby.<sup>15</sup> The coasts are typically flat and composed of loose soil and rock, making them especially prone to hurricane and earthquake

damage.<sup>16</sup> Combined, these factors translate into a hazardous situation: the most built-up, economically productive regions are the most susceptible to and traumatized by natural disasters. To grasp this point, consider a comparison: though both were Category Three hurricanes, Hurricane Katrina's destruction amounted to 30 percent of Louisiana's 2005 GDP and less than 1 percent of the United States', while Hurricane Ivan wreaked havoc representing almost 200 percent of Grenada's 2004 GDP.<sup>17</sup>

Moreover, after the Caribbean is struck by a hurricane or earthquake, its post-disaster capabilities are heavily restricted. The states' meager national budgets prevent them from establishing sufficient emergency funds.<sup>18</sup> Likewise, pre-disaster preparation via catastrophe insurance is next to impossible for individual countries.<sup>19</sup> Insurers are hesitant to service the Caribbean market due to the relatively small amount of business to be received coupled with the relatively large amount of risk to be shouldered.<sup>20</sup> At the same time, the steep debt carried by most Caribbean islands, caused in part by previous natural disasters, impedes their access to credit in the aftermath of the most recent disaster.<sup>21</sup>

**\*139** The Caribbean's deficiencies in responding to catastrophic weather give rise to the existence of a post-disaster "liquidity gap."<sup>22</sup> During the one to six months following a serious weather event, after emergency funds have been exhausted and before donor pledges come in, Caribbean governments' monetary resources fall far below those which are required to provide essential governmental services and begin the recovery process.<sup>23</sup> This is due to the disaster's adverse impact upon business activity. Specifically, when commercial infrastructure is damaged or destroyed, business slows or ceases. This, in turn, causes revenue to decline or disappear, starving the government of the money that enables it to function.<sup>24</sup> Without a means to fill the liquidity gap, the overall recovery process proceeds at a snail's pace, resulting in socioeconomic consequences detrimental to the entire community and especially harsh for the poor.<sup>25</sup>

Established in 2007, the Caribbean Catastrophe Risk Insurance Facility ("CCRIF" or the "Facility") aspires to fill that gap, and as "the first multi-country risk pool in the world," it employs innovative insurance schemes to do so.<sup>26</sup> Its unique design and mode of operation provide cash-strapped Caribbean countries with affordable risk-transfer opportunities that they would otherwise be unable to obtain on their own.<sup>27</sup> Particularly, by combining the resources of multiple Caribbean governments, the Facility supplies catastrophe insurance to each contributing government, covering catastrophic losses caused by hurricanes and earthquakes.<sup>28</sup> Because payouts are calculated using pre-determined parametric equations,<sup>29</sup> as opposed to using loss adjusters who physically visit the scene to discern the actual loss, payouts are made within a very short time after the tragic event, thus narrowing the liquidity gap.<sup>30</sup>

This Article first engages in a background discussion of the Facility, reviewing why it was created, how it works, and what it has done for its insureds since taking effect. It then examines the many facets of CCRIF that have earned it its good name. At the same time, it attempts to provide a more pragmatic critique than can be found in the existing literature by shedding light on a rather notable CCRIF flaw that has thus far received little recognition, having been overshadowed by the Facility's early success. Finally, the Article considers the possible ramifications of this flaw and suggests a plausible solution.

#### **\*140 I. WHY CCRIF WAS CREATED**

In the summer of 2004, Hurricane Ivan swept through the Caribbean Basin, producing extensive damage in Grenada, Jamaica, and the Cayman Islands.<sup>31</sup> As mentioned above, the damage accounted for practically 200 percent of Grenada's 2004 GDP.<sup>32</sup> As a consequence of the liquidity gap, Grenada's government encountered enormous difficulties maintaining its day-to-day operations within a month after Ivan hit.<sup>33</sup> To close the gap, Grenada partook in a number of endeavors, including soliciting donor assistance, restructuring its debt, and adopting mandates aimed at supplementing revenue.<sup>34</sup> Despite its best efforts, part of the gap remained, as Grenada's supply of government resources essential to keep the country running continued to fall short of its demand.<sup>35</sup> Even worse, the government's attentiveness to addressing the liquidity gap hindered its ability to confront what Grenada's citizens so desperately needed at the time-- recovery and reconstruction.<sup>36</sup>

In light of Grenada's devastation and seeking to avoid its repeat in the future, the Caribbean Community (CARICOM)<sup>37</sup> convened a special meeting during which it examined potential ways of dealing with the liquidity gap.<sup>38</sup> After a series of discussions, CARICOM formally requested the World Bank's help in establishing a government insurance regime for the Caribbean region.<sup>39</sup> The World Bank successfully petitioned Japan for the necessary funding of \$2 million.<sup>40</sup> With funding in hand, the World Bank then set out to design a risk-transfer framework capable of alleviating the problems associated with the liquidity gap, drawing upon the lessons learned from Grenada's helpless dilemma after Ivan.<sup>41</sup> What resulted was CCRIF.

## \*141 II. HOW CCRIF WORKS

Based in the Cayman Islands, CCRIF is organized as a nonprofit mutual insurance company.<sup>42</sup> Under Cayman Islands jurisdiction, the Facility functions as a “virtual entity,” forgoing a physical headquarters and permanent staff, and instead employing “a series of sub-contracted companies” to act as its staff.<sup>43</sup> Currently, sixteen of the twenty CARICOM governments are insured by CCRIF.<sup>44</sup> They are the governments of Anguilla, Antigua and Barbuda, the Bahamas, Barbados, Belize, Bermuda, the 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.<sup>45</sup> The Facility was initially capitalized through a one-time participation fee charged to each insured, as well as through donations from numerous donor countries, including Canada, France, and the United Kingdom.<sup>46</sup> It is governed by a five-member Board of Directors comprising: a representative of the insured Caribbean states; a representative of the donor nations; a finance guru; an insurance expert; and a Chairperson, selected by the four other Board members.<sup>47</sup> While “CCRIF has developed and utilises its own dynamic financial analysis system,” its financials are overseen by the Cayman Islands Monetary Authority, by virtue of its auditing and reporting requirements.<sup>48</sup>

CCRIF ventures to achieve two divergent goals: (1) making *adequate* government catastrophe insurance available, and (2) doing so at a price that impoverished governments can *afford*. Its underlying design is tailored to these goals. At its core, the Facility is a risk pool, to which each participating government contributes its share (premium), measured by its anticipated use of the pooled funds.<sup>49</sup> On average, between one and three Caribbean islands endure a catastrophic hurricane or earthquake in any given year.<sup>50</sup> Thus, each year, the pool need only be large enough to cover three losses.<sup>51</sup> For that reason, the premium that is required of a particular government in purchasing CCRIF coverage is substantially less than what it would have to reserve in self-insuring against a catastrophic loss.<sup>52</sup> \*142 Furthermore, the Facility uses a portion of its income to buy reinsurance policies<sup>53</sup> that in turn expand the loss volume it is able to cover.<sup>54</sup> Were the insured governments to purchase reinsurance on their own, they would pay approximately double what CCRIF pays.<sup>55</sup> Finally, the Facility invests some of its assets in financial markets, aiming to realize returns that would make long-term premium reductions possible.<sup>56</sup>

In terms of the coverage it offers, CCRIF protects against catastrophic damage precipitated by earthquakes and hurricane wind.<sup>57</sup> Because the Facility is primarily concerned with addressing the liquidity gap, as contrasted with the full recovery and reconstruction period, coverage for each qualifying event is capped at 20 percent of a government’s expected total loss.<sup>58</sup> With regard to the hurricane product, coverage is available for a one-in-fifteen-year storm.<sup>59</sup> This means that before CCRIF reimbursement is made for any particular hurricane, the government must meet a deductible, also known as an attachment point, “equivalent to the loss expected to be endured by the government [from a single hurricane] once in every 15 years.”<sup>60</sup> In other words, the damage caused by the hurricane must meet a robust threshold before CCRIF will even enter the mix, ensuring that the Facility responds to only catastrophic occurrences.<sup>61</sup> The earthquake product furnishes one-in-twenty-year coverage.<sup>62</sup> For both perils, the maximum CCRIF disbursement during each fifteen- or twenty-year interval is \$100 million.<sup>63</sup> However, in exchange for a lower premium, the Facility permits the Caribbean governments, at their discretion, to settle on a reduced disbursement cap, and a few have chosen to do so.<sup>64</sup> Policy premiums are unique to each country and directly reflect the level of risk the country is transplanting into the pool.<sup>65</sup>

When a CCRIF policyholder experiences an insured loss, it is not compensated in the traditional sense, where loss adjusters are dispatched to ground zero to assess the resulting damage and assign it a dollar amount. Keeping in mind the widespread damage ordinarily caused by major hurricanes and earthquakes in the Caribbean, this process could take months or even years, thus eviscerating the Facility’s objective of remedying the \*143 liquidity gap predicament. Instead, CCRIF computes coverage due according to parametric equations and data supplied by the National Hurricane Center and U.S. Geological Survey, describing the hurricane’s wind speed or earthquake’s resultant degree of ground shaking.<sup>66</sup> More precisely, each parametric equation represents a defined zone of the country in question.<sup>67</sup> Depending on the zone’s population and governmental infrastructure characteristics, which embody its overall level of government exposure, it is assigned either a high or low weight.<sup>68</sup> If a zone is sparsely populated and consists of little governmental infrastructure, its level of government exposure is minimal and its weight low.<sup>69</sup> Conversely, if a zone is heavily populated and includes abundant governmental infrastructure, its level of government exposure is substantial and its weight high.<sup>70</sup> Each zone corresponds to a proportion, based on its weight, of the country’s comprehensive government exposure.<sup>71</sup> To generate the country’s gross loss and, accordingly, its CCRIF payout, either the wind-speed data or ground-shaking data are plugged into each weighted parametric equation.<sup>72</sup> The outputs, which represent each zone’s individual loss, are then aggregated to arrive at the country’s total loss.<sup>73</sup>

This loss calculation is conducted immediately after the disaster and again fourteen days later to incorporate any updates to the wind-speed or ground-shaking data and thus ensure that the correct numbers are used.<sup>74</sup> If the recalculation demonstrates that the loss is eligible for CCRIF indemnification, payment is then promptly made.<sup>75</sup>

Finally, it is important to note what CCRIF does not do. First, it does not offer private insurance policies; it exclusively caters to governmental needs.<sup>76</sup> Second, hurricane policies presently in effect do not cover damage brought about by torrential rainfall and resulting flooding often associated with hurricanes; they only cover wind damage.<sup>77</sup> However, this will soon change. Responding to the Caribbean's expressed interest in and strong need for such coverage, the Facility has developed an excess rainfall product, wholly separate from its hurricane product.<sup>78</sup> In conformity with its role as a catastrophe insurer, CCRIF's rainfall product will only protect against "extreme high rainfall events of short duration (a few days)."<sup>79</sup> According to the Facility, "a business plan for offering the product \*144 will be finalised in February 2012," and available for purchase by select insureds shortly thereafter.<sup>80</sup>

Similarly, CCRIF products do not provide any coverage to the Caribbean agricultural and utility sectors, despite their appreciable vulnerability to extreme weather events and the far-reaching effects on the surrounding community when they do fall victim to such disasters.<sup>81</sup> But again, changes are in the works. Dialogue regarding the creation of such coverage is ongoing and action plans have emerged.<sup>82</sup> The analytical work required to generate an electrical utility product is nearing completion, and the regulatory issues accompanying the existence of such a product are now being explored.<sup>83</sup> The current hurdle is procuring the funding necessary to see the plans through.<sup>84</sup> Recently, the International Finance Corporation expressed interest in supporting the utility product, but has not yet made any firm commitment to do so.<sup>85</sup> Above all, it is crucial to understand that the Facility is in no way an all-encompassing solution to the Caribbean's climate threats. "[I]t only addresses a small niche in the required risk management toolkit," which is, as explored above, the lessening of the liquidity gap.<sup>86</sup> CCRIF insurance is not designed to cover every post-disaster need, or even most post-disaster needs. While potentially of great value, it is but one piece of the puzzle.

### III. WHAT CCRIF HAS DONE FOR ITS INSUREDS SINCE TAKING EFFECT

Since it began doing business in 2007, CCRIF has made eight insurance payouts to seven Caribbean states.<sup>87</sup> Accounting for one hurricane, two tropical cyclones, and two \*145 earthquakes, the payouts totaled \$32,179,470.<sup>88</sup> Among the Facility-triggering events were Hurricane Ike hitting the Turks and Caicos Islands as a Category Four on September 6-7, 2008, and the savage Haiti earthquake, striking as a magnitude 7.0 on January 12, 2010.<sup>89</sup> Ike led to a \$6.3 million payout, while the Haiti quake resulted in a \$7.8 million payout, amounting to the third- and second-largest payouts in CCRIF history, respectively.<sup>90</sup> Notably, in addition to paying Haiti its insurance proceeds, CCRIF played a key role in improving the island's recovery and reconstruction efforts.<sup>91</sup> Particularly, the Facility gathered, analyzed, and furnished the island with data indicating where to relocate its displaced citizens and rebuild its crumbled infrastructure so that they would be out of harm's way in future floods and landslides.<sup>92</sup>

Interestingly, of the eight CCRIF payouts made to date, four occurred in 2010. These payouts were in response to two tropical cyclones, Earl and Tomas, which swept through the Caribbean Basin on August 30, 2010, and October 30-31, 2010, respectively.<sup>93</sup> Tomas was the catalyst for the biggest payout thus far, affecting three Caribbean states--Barbados, St. Lucia, and St. Vincent and the Grenadines--and prompting an aggregate payout of \$12,892,248.<sup>94</sup>

Thus, it appears that CCRIF is working as intended. Participating governments are receiving much-needed cash in the wake of major weather incidents and they are receiving it rapidly--less than three weeks following the hurricane or earthquake. Indeed, the insured governments seem to approve of the workings of the Facility, as all sixteen renewed their policies for the 2011-12 year.<sup>95</sup>

More broadly, the Facility as a whole seems to be a huge success. Not only is it fulfilling its intended purpose, as will be surveyed below, but it is also doing so efficiently, fairly, and always with the Caribbean's concerns in mind. In fact, its overwhelmingly positive feedback has sparked the interest of other areas of the world, especially in Central America and the Pacific Islands territory, which are looking to the Facility's framework as a model for their own catastrophe insurance.<sup>96</sup> Notwithstanding all that can be said for CCRIF, it is afflicted with an unsettling, and often unacknowledged, flaw that may cast a shadow on its otherwise bright future. While its products, on their face, show a great deal of promise, there \*146 is no guarantee they appropriately correspond to what is happening on the ground, and in at least one instance, clearly did not. The

remainder of this Article investigates why CCRIF has deservedly received such outstanding esteem, and considers how, due to its potential to contradict reality, that esteem could be compromised. Ultimately, this Article offers a recommendation aimed at preventing such compromise.

#### **IV. CCRIF'S FIRST-CLASS REPUTATION**

CCRIF is impressive for many reasons. Despite its shortcomings, which will be explored below, most, if not all, of the Facility's positive aspects truly make it an unsurpassed risk-coping mechanism for the Caribbean. These aspects can be organized into three criteria: (A) those promoting efficiency; (B) those promoting fairness; and (C) those promoting, either directly or indirectly, attentiveness to Caribbean needs and interests.

##### ***A. Efficiency***

The efficiency of CCRIF is principally derived from the benefits of risk-pooling. As explained above, the risk pool allows Caribbean states to shield against extreme weather at a greatly reduced price than would be required without the pool. Simultaneously, the increased resources acquired through pooling facilitate access to reinsurance and capital markets, which expand the shield and further reduce the price. The efficiency scales tip in favor of catastrophe insurance via a multi-country risk pool, relative to the self-insurance alternative. By way of the pool, each country enjoys as much or even greater coverage, for a lower price, than it would otherwise.

A second hallmark of CCRIF, its parametric nature, also drives efficiency. Because loss determinations do not entail adjusters or site visits, the Facility's operating costs do not take the associated hit. The savings are then passed along to the Caribbean island policyholders, in the form of lower premiums. Similarly, the parametric equations' wind-speed and ground-shaking inputs are obtained from public sources, enabling CCRIF to acquire the data at no cost. Again, the savings are reflected in cheaper premiums.

Cost savings, and hence efficiency, are additionally realized as a result of the Facility's organizational structure. CCRIF's nonprofit status exempts it from paying taxes on its income and distributing dividends. Its lack of a building and staff saves it the resources associated with their maintenance. Both drive down operating costs and lead to more premium cuts for CCRIF policyholders.

##### ***B. Fairness***

The Facility designed its policies with fairness to its Caribbean clients as an obvious priority. To begin with, each state's premium is in direct relation to the state's catastrophic weather risk covered by the Facility. This guarantees objectivity and safeguards the other states from having to compensate in the event that one state was undercharged. At the same time, when a country's policy is triggered it will receive, at the very least, an insurance \*147 payment equaling its premium.<sup>97</sup> This ensures that in facing a loss, the country recoups its CCRIF investment and possesses the funds it would have possessed without such investment, to combat the loss.

Moreover, the policies' parametric features foster fairness through transparency. Specifically, each Caribbean nation is, from the beginning of its relationship with the Facility, fully informed of the manner in which its potential payout will be calculated, as the loss equations are established before the policies take effect. If the nations are diligent in understanding the equations, nothing will come as a surprise. Closely related is the fact that the equations' data inputs exist in the public domain, making them just as accessible to the insured governments as they are to CCRIF. Because the above information is easily at their disposal, the governments can verify the accuracy of their payouts if they wish, acting as a supervisory force over the Facility. As already indicated, CCRIF attempts to provide consistently accurate payouts by reevaluating them two weeks after the initial evaluation, in case updated wind-speed or ground-shaking figures have been released. Finally, in instances where the second evaluation signifies that a loss does not qualify for a payout, the Facility notifies the country of the basis for denial and gives it an opportunity to challenge the decision.<sup>98</sup> If the challenge uncovers issues warranting a third evaluation, CCRIF will conduct one.<sup>99</sup> These review procedures help make certain that payout denials are equitable and just.

### *C. Attentiveness to Caribbean Needs and Interests*

Perhaps most importantly, CCRIF deserves recognition for being quite responsive to the Caribbean's circumstances. Of course, the region's pressing need, a solution to the liquidity gap, is attended to by the Facility's parametrically induced payouts. Besides the obvious, CCRIF has been amenable to Caribbean requests and apprehensions, and remarkably diligent in resolving them. The most noteworthy example of this diligence is found in the up-and-coming excess rainfall product. Within a couple years of its inception, it became apparent that the Facility was wanting in its ability to provide effective coverage for hurricane rainfall. A number of Caribbean states fell victim to hurricanes that brought not only wind damage, but also devastating flood damage.<sup>100</sup> Consequently, their CCRIF policies were of limited or no help. As a result, the affected states petitioned the Facility to modify its coverage options, and recognizing the urgency of this request, CCRIF immediately began work on the rainfall product.<sup>101</sup> The coverage will be rolled out in June 2012.<sup>102</sup> Likewise, the \*148 Caribbean's appeals for agricultural and utility coverage have not gone unheard, as the Facility is presently in the initial stages of development on these fronts.<sup>103</sup>

Given that the Caribbean islands are largely poor, CCRIF has done its best to keep premiums manageable. As discussed above, the Facility's operating costs are at a bare minimum, effectuating lower premiums. Notwithstanding the already low premiums, in both 2008 and 2009, CCRIF slashed prices by an additional 10 percent.<sup>104</sup> If a Caribbean state is still unable to satisfy its premium obligations, the Facility has arranged for the Caribbean Development Bank and the World Bank to assist it in doing so.<sup>105</sup> Due to the trauma caused by its cataclysmic earthquake, Haiti required such assistance to meet its 2010-11 premium.<sup>106</sup>

Finally, the workings of CCRIF produce many secondary benefits that advance critical Caribbean interests. Significantly, the formulation of the parametric equations and their outputs led to the establishment of databases that were previously nonexistent in the Caribbean.<sup>107</sup> Particularly, two datasets were created--one describing each island's government exposure, explained above; and the other, dubbed the verification dataset, describing the equations' output, or estimated loss, for each event parametrically evaluated. These datasets are of crucial importance because they provide Caribbean states with a better understanding of how their territories are impacted by extreme weather. This awareness in turn aids the states in identifying appropriate mitigation and adaptation techniques most likely to enhance their disaster resilience. Additionally, being able to recognize the best disaster-coping strategies lessens a country's risk, thereby opening the door to formerly unavailable insurance instruments. Simultaneously, CCRIF encourages smart disaster preparedness by instituting prerequisites to joining the Facility, including commitments to the proper upkeep of the islands' infrastructure and implementation and enforcement of disaster-resistant building codes.<sup>108</sup>

Unquestionably, CCRIF has many reasons to be proud. Efficient, fair, and attentive to Caribbean needs and interests--what more could one ask for? Therefore, it is no wonder that commentators have hailed it as *the* answer to confronting catastrophic weather risks. For instance, regarding other regions' potential adoption of a similar insurance instrument, Integrated Regional Information Networks (IRIN), a news service provided by the United Nations Office for the Coordination of Humanitarian Affairs, proclaimed CCRIF as "[t]he \*149 one to emulate."<sup>109</sup> While it may well be a guiding light, it is not without fault--a fault upon which these same commentators have failed to comment. This Article aims to give this fault the full regard it warrants.

### **V. CCRIF'S FORGOTTEN FLAW**

CCRIF's most salient characteristic, its parametric nature, is also the source of its grand disappointment. As a consequence of data deficiencies, the Facility's parametric equations run the risk of generating loss figures that in no way resemble actual loss. Again, government exposure is defined by the population and governmental infrastructure situated in each parametric zone. The equations are weighted commensurate with their zones' level of government exposure. By CCRIF's own admission, Caribbean exposure data did not exist at the time the parametric equations were developed because the states never kept records of such information; thus, many CCRIF models are rooted in assumptions.<sup>110</sup> One need only imagine the extent to which such assumptions have distorted the Facility's ability to generate accurate loss calculations. If the parametric outputs show that the estimated loss is above the actual loss, overpayment is made, thereby comparatively disadvantaging the other countries participating in the pool. Even more detrimental is the opposite outcome where the parametric outputs convey that the estimated loss is below the actual loss, forcing an already compromised government to cope with an insufficient payout.

Perhaps this data shortfall offers insight into the questionable earthquake payout made to Dominica in 2007. Despite minimal actual damage, the parametric outputs indicated that a payment of more than \$500,000 was justified.<sup>111</sup> Dominica applied the money toward reconstruction efforts resulting not from the earthquake, but from Hurricane Dean, a substantial storm that struck three Caribbean islands in 2007, including Dominica, and produced major damage.<sup>112</sup> Interestingly, Dean did not trigger any CCRIF payouts, although **\*150** the affected islands and other Caribbean onlookers believe it should have.<sup>113</sup> While the Facility dismissed the Dean controversy by maintaining that most of the hurricane's damage was to the agricultural sector, which is not covered under CCRIF policies, as a direct result of Dean it nonetheless modified its hurricane payout structure by lowering the deductible in 2008, thus providing coverage for less intense storms going forward.<sup>114</sup>

The Facility has also briefly acknowledged that, like the government exposure data, verification data to test the equation outputs was comparably lacking.<sup>115</sup> Astonishingly, this means that after the equations were completed, CCRIF had no systematic way to confirm their accuracy. Rather, it learns what it can from each evaluated loss, much like an ongoing experiment. Specifically, after a Caribbean state experiences a qualified weather event and receives CCRIF payment, the Facility attempts to gather data indicative of the actual loss sustained, assuming that data exists.<sup>116</sup> In some cases, it does not.<sup>117</sup> Moreover, when the data is available, the multitude of agencies supplying it often report contradictory figures.<sup>118</sup> Nonetheless, CCRIF compares the actual loss data with the estimated loss data generated by the parametric equations.<sup>119</sup> While the Facility admits it is technically feasible to adjust the equations according to actual loss numbers, it maintains it is not practically feasible due to the enormous complexity of the task.<sup>120</sup> Instead, the Facility can only undertake comprehensive overhauls of its parametric model every few years.<sup>121</sup> In the interims, the Caribbean will have to tolerate the kinks and accept the reality that for any given disaster, its CCRIF payout may conflict with its actual loss. Needless to say, Dominica benefitted from this possible discrepancy, but the much more likely scenario is that a government may find itself in need of sufficient relief, as evidenced by the two uncompensated Caribbean islands that, in addition to Dominica, fell victim to Hurricane Dean.

Of course, it must be conceded that in order to bring about the mere existence of the Facility, loss calculations derived without adequate exposure and verification data were unavoidable. That is, when the World Bank learned that such data was lacking during the **\*151** CCRIF design phase, it had no choice but to proceed on assumptions. Dispatching individuals to each Caribbean nation to collect the missing data would have been both time-consuming and costly. When the World Bank became aware of the data issues, it was already deep into the design process and had assured the Caribbean governments that an insurance product would be unveiled and ready for use within an expedient timeframe. One can imagine the hostility and opposition these desperate governments would have exuded had the World Bank resolved to postpone the release for the long, tedious task of immense data acquisition. Furthermore, the human resources required to complete such a task, coupled with its lengthy duration, translate into tens of thousands of dollars of compensation, driving up premium costs to a level unattainable by the Caribbean states. Ultimately, the decision to use parametric equations heavily dependent on assumptions can be viewed as a tradeoff between CCRIF payout accuracy and overall CCRIF feasibility.

Nonetheless, it simply cannot be denied how critical accurate payouts are. This is especially true in light of the extraordinarily harsh effects global climate change promises to bring to the Caribbean. With their uncertain futures compromised by climate change, Caribbean nations will need every last disaster-fighting resource available to them, and in the CCRIF context, every last penny to which they are entitled.

## **VI. A SOLUTION**

Fortunately, CCRIF does have the capacity to improve its payouts. As discussed, it is already doing so by way of its normal operations, reworking its parametric equations every so often. However, a far superior, more expeditious, and cost-effective option is available: calling on the Caribbean people, particularly the locals, to assist in data collection. Because these individuals literally reside in the zones the parametric equations represent, they are the most familiar with the governmental infrastructure present and are therefore the best sources of this information. Put another way, most of us know if there is a courthouse down the street from our homes, and where it is located. The same can be said for the Caribbean people. If the Facility can organize a system by which a number of locals living in each zone provide it with the infrastructure characteristics of their respective zones, it will rapidly procure the data it seeks and more importantly, the *accurate* data it seeks.



For this approach to be successful, the Facility first must designate its zone representatives. The most qualified for the job are those already employed by the government, such as police officers and court personnel. Not only do they live among the governmental infrastructure, but they also work in it. The second concern involves the compensation these representatives will receive for their services. Because CCRIF must keep its costs at a bare minimum, any cash compensation will regrettably have to be miniscule. For that reason, alternative compensation schemes, not including cash payment, should be explored. Because the Facility is not in a position to offer such alternatives, the individual Caribbean governments must bear these expenses. Although seemingly inequitable, even were CCRIF to assume responsibility for the compensation, these costs would, in all likelihood, inevitably fall upon the shoulders of the governments anyhow, in the guise of elevated premiums. Another benefit, although admittedly a contentious one, of putting the \*152 governments in control of representative compensation is their power to do away with compensation altogether. Instead, they could simply incorporate the representatives' services into their governmental job descriptions, thus turning the data accumulation and reporting activities into work-related requirements.

The third and final determination that must be made is the manner in which the data will be congregated and supplied to the Facility. For gathering purposes, a basic questionnaire-type form, prepared by CCRIF, will suffice. The representatives will fill out the form, indicating the quantity and approximate size of each type of governmental infrastructure designation situated in their respective areas. Upon completion, they will turn the forms over to their employers, who will then see to it that they reach the Facility. CCRIF must draft these forms in a fashion that promotes simplicity and succinctness. The more elaborate and protracted they are, the greater the prospect that errors will be committed, either because the representatives do not fully understand what is being asked, or because they have grown weary of filling them out and begin to forge information in an ill-conceived effort to dispense with the task more quickly. Further, long and complicated forms demand more of the representatives' time and effort, which drive up compensation amounts.

Obviously, this proposal is a gross simplification of the procedure that will ultimately be required. But with the intricacies added, it possesses the capability of transforming into a very real and appropriate solution to CCRIF's data insufficiencies. It will alleviate the problems far more swiftly than the Facility's current trial-and-error strategy by allowing for mass stockpiling of data, as opposed to one-by-one buildup. If the compensation schemes and governmental infrastructure forms are mapped out properly, its costs will be relatively negligible. And, most significantly, it will facilitate the replacement of assumptions with highly accurate, true-to-life data that triggers correct CCRIF payouts.

## CONCLUSION

The Caribbean Catastrophe Risk Insurance Facility has undeniably been a breath of fresh air for the Caribbean region. Terrorized by natural disasters, and confronted by a future promising further weather deterioration in the face of climate change, the region has been able to call upon CCRIF in some of its most critical hours of need. The Facility's exceptional framework enabled it, in most of these instances, to answer the call. Notwithstanding its success, however, CCRIF's data issues have thus far translated into at least one questionable payout and one questionable non-payout. Although it is tempting to argue that these payout follies are theoretically and mathematically inconsequential, the Caribbean states that fell victim to them would surely argue otherwise. Until the data problems are genuinely addressed, in contrast with the Facility's slow and highly inefficient efforts to correct them, the risk of additional mis-payouts will remain. But it need not remain. If the Facility adopts the proposal set forth in this Article, its data woes will come to an end, allowing it to answer the Caribbean's call not just most of the time, but every time.

## Footnotes

<sup>a1</sup> J.D. Candidate with Certificate in Environmental Law, Science, & Policy, University of Arizona James E. Rogers College of Law, 2012.

<sup>1</sup> Richard B. Alley et al., *Summary for Policymakers*, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 5 (Susan Solomon et al. eds., 2006) (emphasis added).

<sup>2</sup> *Id.* at 7-9.

3 *Id.* at 8, 12-17.

4 *Id.* at 16-17 (emphasis added).

5 Risks associated with volcanic eruptions in the Caribbean are beyond the scope of this Article. Nonetheless, they are a significant threat, beyond that posed by hurricanes and earthquakes, to at least two Caribbean states-- Montserrat and the U.S. Virgin Islands. CARIBBEAN POLICY DEV. CTR., THE POTENTIAL ROLE OF THE CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY (CCRIF) AS A TOOL FOR SOCIAL PROTECTION, DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION: A CIVIL SOCIETY PERSPECTIVE 19 (2009), available at [http://www.cpdngo.org/cpdc/index.php?option=com\\_docman&task=cat\\_view&gid=64&Itemid=27](http://www.cpdngo.org/cpdc/index.php?option=com_docman&task=cat_view&gid=64&Itemid=27) (follow “CCRIF document” hyperlink) [hereinafter *Potential Role of CCRIF*].

6 FRANCIS GHESQUIERE ET AL., CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY: A SOLUTION TO THE SHORT-TERM LIQUIDITY NEEDS OF SMALL ISLAND STATES IN THE AFTERMATH OF NATURAL DISASTERS 2, available at <http://siteresources.worldbank.org/PROJECTS/Resources/Catastrophicriskinsurancefacility.pdf> [hereinafter CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS]; Francis Ghesquiere & Olivier Mahul, *The Caribbean Catastrophe Risk Insurance Facility: Providing Immediate Funding After Natural Disasters*, 2 OPERATIONAL INNOVATIONS IN LATIN AM. & THE CARIBBEAN 2 (Mar. 2008), available at <http://siteresources.worldbank.org/LACEXT/Resources/ONS4CCRIFComplete.pdf>.

7 *Potential Role of CCRIF*, *supra* note 5, at 17.

8 *Id.* at 14, 17.

9 CARIBBEAN CATASTROPHE RISK INS. FACILITY [hereinafter CCRIF], ENHANCING THE CLIMATE RISK AND ADAPTATION FACT BASE FOR THE CARIBBEAN: AN INFORMATIONAL BROCHURE HIGHLIGHTING THE PRELIMINARY RESULTS OF THE ECA STUDY 4 (Aug. 2010), available at <http://www.ccrif.org/sites/default/files/publications/ECABrochureFinalAugust182010.pdf>.

10 *Id.* at 4-5.

11 *Id.* at 5.

12 *Id.* at 4.

13 Simon Young & Ekhosuehi Iyehen, *CCRIF Briefing Document: Climate Change and Caribbean Economies: Implications, Adaptation and Risk Management* (2009), reprinted in CCRIF: A NATURAL CATASTROPHE RISK INSURANCE MECHANISM FOR THE CARIBBEAN: A COLLECTION OF TECHNICAL PAPERS AND ARTICLES 48, 56 (2009), available at <http://www.ccrif.org/sites/default/files/CCRIFBookletNovember232009.pdf> [hereinafter A COLLECTION OF TECHNICAL PAPERS AND ARTICLES].

14 Simon Young & Milo Pearson, *Natural Catastrophe Risk Insurance Mechanisms for Asia and the Pacific: The CCRIF as a Technical Model* (2008), in A COLLECTION OF TECHNICAL PAPERS AND ARTICLES 14, 15; Simon Young & Ekhosuehi Iyehen, CCRIF, *Innovative Risk Transfer Options as Adaptation Strategies to Growing Hydro-Meteorological Risks in the Caribbean Basin* [hereinafter *Innovative Risk Transfer Options*], in A COLLECTION OF TECHNICAL PAPERS AND ARTICLES 38, 39.

15 *Innovative Risk Transfer Options*, *supra* note 14.

16 Young & Pearson, *supra* note 14.

17 *Innovative Risk Transfer Options*, *supra* note 14, at 46.

18 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 1.

19 *Id.*; *Potential Role of CCRIF*, *supra* note 5.

20 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 1; *Potential Role of CCRIF*, *supra* note 5.

21 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 1.

22 CCRIF, A GUIDE TO UNDERSTANDING CCRIF: A COLLECTION OF QUESTIONS AND ANSWERS 5 (2010), *available at* [http:// www.ccrif.org/sites/default/files/publications/BookletQuestionsAnswersMarch2010.pdf](http://www.ccrif.org/sites/default/files/publications/BookletQuestionsAnswersMarch2010.pdf) [hereinafter UNDERSTANDING CCRIF].

23 *See, e.g., id.*; Young & Pearson, *supra* note 14, at 16.

24 Young & Pearson, *supra* note 14, at 16.

25 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 1.

26 UNDERSTANDING CCRIF, *supra* note 22, at 3, 5.

27 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 2-3.

28 *Id.* at 2.

29 Parametric equations produce outputs that reveal the relationship between any number of input parameters. In the CCRIF context, the equations' parameters include governmental exposure values and either wind-speed or ground-shaking numbers. These parameters will be more fully explained below. *Potential Role of CCRIF*, *supra* note 5, at 20; Young & Pearson, *supra* note 14, at 19-20.

30 UNDERSTANDING CCRIF, *supra* note 22, at 5, 10.

31 Young & Pearson, *supra* note 14.

32 *Innovative Risk Transfer Options*, *supra* note 14, at 46.

33 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6.

34 *Id.*

35 *Id.*

36 *Id.*

37 CARICOM is the integrated body of Caribbean states striving to enhance their economic well-being through collective action. *See History of the Caribbean Community (CARICOM)*, CARIBBEAN COMMUNITY (CARICOM) SECRETARIAT, <http://www.caricom.org/jsp/community/history.jsp?menu=community&prnf=1> (last visited Mar. 14, 2011); *Objectives of the Community*, CARIBBEAN COMMUNITY (CARICOM) SECRETARIAT, <http://www.caricom.org/jsp/community/objectives.jsp?menu=community&prnf=1> (last visited Mar. 14, 2011).

38 Young & Pearson, *supra* note 14.

39 *Id.*

40 *Id.* at 16.

41 *Id.*

42 UNDERSTANDING CCRIF, *supra* note 22, at 3. A mutual insurance arrangement involves insureds who insure themselves, via a common pool that they together generated, and from which claims are paid.

43 Young & Pearson, *supra* note 14, at 23 (internal quotation omitted).

44 UNDERSTANDING CCRIF, *supra* note 22, at 13; *CARICOM Member States & CARICOM Associate Members*, CARIBBEAN COMMUNITY (CARICOM) SECRETARIAT, [http://www.caricom.org/jsp/community/member\\_states.jsp?menu=community&prnf=1](http://www.caricom.org/jsp/community/member_states.jsp?menu=community&prnf=1) (last visited Mar. 14, 2011).

45 UNDERSTANDING CCRIF, *supra* note 22, at 13.

46 Young & Pearson, *supra* note 14, at 28-29; *Potential Role of CCRIF*, *supra* note 5, at 23.

47 Young & Pearson, *supra* note 14, at 26.

48 *Id.* at 27; UNDERSTANDING CCRIF, *supra* note 22, at 25.

49 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6.

50 *Id.*

51 *Id.*

52 *See id.*

53 Reinsurance is essentially insurance for an insurer. It allows the insurer to transfer some of its risk to another insurer (the

reinsurer), and in the process reduce its liability in the event of an insured loss, as the reinsurer agrees to be responsible for a share. Because the cost of reinsurance is much less than the prospective liability being transferred, reinsurance offers a mechanism to enlarge claims-paying ability.

54 UNDERSTANDING CCRIF, *supra* note 22, at 23.

55 CCRIF: A SOLUTION TO SHORT-TERM LIQUIDITY NEEDS, *supra* note 6, at 3.

56 UNDERSTANDING CCRIF, *supra* note 22, at 25.

57 *Id.* at 6.

58 *Potential Role of CCRIF*, *supra* note 5.

59 UNDERSTANDING CCRIF, *supra* note 22, at 6.

60 *Potential Role of CCRIF*, *supra* note 5, at 20.

61 *Id.*

62 UNDERSTANDING CCRIF, *supra* note 22, at 6.

63 *Id.*

64 *Potential Role of CCRIF*, *supra* note 5, at 20.

65 UNDERSTANDING CCRIF, *supra* note 22, at 6.

66 Young & Pearson, *supra* note 14, at 19-20.

67 *Potential Role of CCRIF*, *supra* note 5, at 20.

68 *Id.*

69 *Id.*

70 *Id.*

71 *Id.*

72 *Id.*

73 *Id.*

74 UNDERSTANDING CCRIF, *supra* note 22, at 11-12.

75 *Id.* at 12.

76 *Id.* at 13.

77 *Id.* at 6-8.

78 *Id.* at 7-8.

79 CCRIF, QUARTERLY REPORT: 1 SEPTEMBER - 30 NOVEMBER 2010 12 (2010), *available at* [http://www.ccrif.org/sites/default/files/publications/CCRIF\\_Quarterly\\_Report\\_Sep-Nov\\_2010.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIF_Quarterly_Report_Sep-Nov_2010.pdf) [hereinafter SEPT-NOV 2010 QUARTERLY].

80 CCRIF, QUARTERLY REPORT: SEPTEMBER - NOVEMBER 2011 6, 28 (2011), *available at* [http://www.ccrif.org/sites/default/files/publications/CCRIF\\_Quarterly\\_Report\\_Sept\\_Nov\\_2011.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIF_Quarterly_Report_Sept_Nov_2011.pdf).

81 *See* UNDERSTANDING CCRIF, *supra* note 22, at 9.

82 SEPT-NOV 2010 QUARTERLY, *supra* note 79; CCRIF, QUARTERLY REPORT: 1 JUNE - 31 AUGUST 2010 10 (2010), *available at* [http://www.ccrif.org/sites/default/files/publications/CCRIF\\_Quarterly\\_Report\\_June\\_August\\_2010.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIF_Quarterly_Report_June_August_2010.pdf) [hereinafter JUNE-AUG 2010 QUARTERLY].

83 CCRIF, ANNUAL REPORT: 2010 - 2011 31 (2011), *available at* [http://www.ccrif.org/sites/default/files/publications/CCRIFAnnualReport2010\\_2011.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIFAnnualReport2010_2011.pdf) [hereinafter 2010-11 ANNUAL].

84 SEPT-NOV 2010 QUARTERLY, *supra* note 79; JUNE-AUG 2010 QUARTERLY, *supra* note 82.

85 2010-11 ANNUAL, *supra* note 83.

86 Young & Pearson, *supra* note 14, at 36.

87 2010-11 ANNUAL, *supra* note 83, at iii; SEPT-NOV 2010 QUARTERLY, *supra* note 79, at 1; CCRIF, ANNUAL REPORT: 2009-2010 16 (2010), *available at* [http://www.ccrif.org/sites/default/files/publications/CCRIF\\_Annual\\_ReportSeptember272010\\_0.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIF_Annual_ReportSeptember272010_0.pdf) [hereinafter 2009-10 ANNUAL]; CCRIF, ANNUAL REPORT: 2008-2009 18 (2009), *available at* [http://www.ccrif.org/sites/default/files/CCRIF\\_Annual\\_ReportSeptember142009.pdf](http://www.ccrif.org/sites/default/files/CCRIF_Annual_ReportSeptember142009.pdf) [hereinafter 2008-09 ANNUAL]; CCRIF, ANNUAL REPORT: 2007-2008 10 (2008), *available at* <http://www.ccrif.org/sites/default/files/publications/CCRIF-AnnualReport2008.pdf> [hereinafter 2007-08 ANNUAL].

88 SEPT-NOV 2010 QUARTERLY, *supra* note 79, at 1; 2009-10 ANNUAL, *supra* note 87; 2008-09 ANNUAL, *supra* note 87; 2007-08 ANNUAL, *supra* note 87, at 10, 23.

89 2009-10 ANNUAL, *supra* note 87; 2008-09 ANNUAL, *supra* note 87, at 17-18.

90 2009-10 ANNUAL, *supra* note 87; 2008-09 ANNUAL, *supra* note 87.

91 JUNE-AUG 2010 QUARTERLY, *supra* note 82, at 15.

92 *Id.*

93 SEPT-NOV 2010 QUARTERLY, *supra* note 79, at 1.

94 *Id.*

95 CCRIF, QUARTERLY REPORT: 1 JUNE - 31 AUGUST 2011 23 (2011), available at [http://www.ccrif.org/sites/default/files/publications/CCRIF\\_Quarterly\\_Report\\_June-August2011.pdf](http://www.ccrif.org/sites/default/files/publications/CCRIF_Quarterly_Report_June-August2011.pdf).

96 Steven Ambrus, *Climate Change Spawns Caribbean Insurance Pool*, ECOAMÉRICAS, Jan. 2011, at 1, 9; *Lloyd's Notes Success of Regional Catastrophe Pools*, CCRIF, INS. JOURNAL (Oct. 26, 2009), <http://www.insurancejournal.com/news/international/2009/10/26/104776.htm>.

97 Young & Pearson, *supra* note 14, at 32.

98 *Potential Role of CCRIF*, *supra* note 5, at 33.

99 *Id.*

100 *See, e.g.*, Young & Pearson, *supra* note 14, at 24.

101 *Will CCRIF Have a New Product Involving Excess Rainfall Coverage in the Near Future?*, CCRIF, <http://www.ccrif.org/node/85> (last visited Apr. 6, 2012).

102 Barbara Salgado, *CCRIF to Begin Offering Rainfall Policies in June, Says CEO*, BUS. NEWS AMERICAS (Mar. 1, 2012), <http://www.bnamericas.com/news/insurance/ccrif-to-begin-offering-rainfall-policies-in-june-says-ceo/291327583>.

103 *Frequently Asked Questions*, CCRIF, <http://www.ccrif.org/faq> (last visited Apr. 6, 2012).

104 2009-10 ANNUAL, *supra* note 87, at 7.

105 *Id.* at 9.

106 JUNE-AUG 2010 QUARTERLY, *supra* note 82, at 4.

107 *Innovative Risk Transfer Options*, *supra* note 14, at 46.

108 *Potential Role of CCRIF*, *supra* note 5, at 32.

109 *Climate Change: Disaster Insurance the Caribbean Way*, IRIN (Dec. 16, 2010), <http://www.irinnews.org/Report.aspx?ReportID>

=91385; see also Jared Wade, *The Risks of Climate Change: Christiana Figueres Wants Improved Resiliency and Insurance*, RISK MGMT. MONITOR (Sept. 22, 2010), <http://www.riskmanagementmonitor.com/the-risks-of-climate-change-christiana-figueres-wants-improved-resiliency-and-insurance-solutions> (informing that “just about everyone ... in attendance” at Climate Week NYC 2010 “touted [CCRIF] as a prime example of a way” to solve climate change risks); GENEVA ASS’N ET AL., GLOBAL INSURANCE INDUSTRY STATEMENT ON ADAPTING TO CLIMATE CHANGE IN DEVELOPING COUNTRIES 3 (2010), available at [http://www.genevaassociation.org/PDF/General\\_Information/Developing\\_World\\_Statement.pdf](http://www.genevaassociation.org/PDF/General_Information/Developing_World_Statement.pdf) (stating that CCRIF’s design is capable of “creat[ing] tailored, institutionally light and flexible solutions for particular regions”).

110 Young & Pearson, *supra* note 14, at 18, 24.

111 *Potential Role of CCRIF*, *supra* note 5, at 34.

112 *Id.*

113 See Keith Collister, *Jamaica Won’t Benefit from Caribbean Catastrophe Insurance*, JAMAICA GLEANER (Aug. 22, 2007), <http://jamaica-gleaner.com/gleaner/20070822/business/business1.html>; *Hurricane Dean: \$3bn in Caribbean Damage and No Money from Its Insurance Policy*, BVI HURRICANE NEWS (Aug. 24, 2007), <http://www.bvihurricane.com/2007/08/24/hurricane-dean-3bn-in-caribbean-damage-and-no-money-from-the-world-bank>.

114 UNDERSTANDING CCRIF, *supra* note 22, at 26; *CCRIF Announces Changes for 2008 Renewal*, CCRIF (Feb. 21, 2008), <http://www.ccrif.org/content/ccrif-announces-changes-2008-renewal>.

115 Young & Pearson, *supra* note 14, at 18.

116 CCRIF, UNDERSTANDING HOW CCRIF WORKS AND INSIGHTS INTO THE REAL-TIME FORECASTING SYSTEM: ANSWERS TO FREQUENTLY ASKED QUESTIONSSS 5-8 (Nov. 2011), available at <http://www.ccrif.org/sites/default/files/publications/BookletQuestionsAnswersNovember2011.pdf>.

117 *See id.* at 6.

118 *Id.* at 7.

119 *Id.* at 5-8.

120 *See id.* at 8.

121 *See id.*