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The Hazard Landscape of Small States and the Role of Risk Transfer in Reducing Vulnerability to Natural Hazards

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Vulnerability of Small States

The vulnerability of Caribbean states to natural hazards is well known. They have intrinsic economic, environmental and social vulnerability due to their small size, limited natural resource base, significant competition for land use and a high level of dependence of major economic sectors on the natural environment, fragile ecosystems. Many also have limited institutional capacity and low levels of insurance coverage. Additionally, small island states – as well as coastal states - have a high concentration of people and infrastructure located in the coastal zones, further increasing their vulnerability to hydro-meteorological events and climate change.

Natural hazards continue to have an inordinate impact on the economies of Caribbean countries, many of which depend on tourism and agriculture as their main economic drivers. For almost all governments in the Caribbean, a direct hit by a major hurricane is the single largest risk to its economy, and thus its society. A case in point is Hurricane Ivan, which



caused billions of dollars of losses across the Caribbean in 2004. In both Grenada and the Cayman Islands, losses were close to 200% of their national annual Gross Domestic Product (GDP) and a further seven countries were also severely

impacted. Regional losses from Ivan amounted to over US\$ 6 billion and there are many other events that also have caused significant impacts on populations and GDP – reducing economic growth prospects and creating a cycle of poverty.



Natural hazards continue to have an inordinate impact on the economies of Caribbean small island and coastal states, many of which depend on tourism and agriculture as their main economic drivers.

By contrast, Hurricane Katrina, which devastated Louisiana and Mississippi in the United States in 2005 and is acknowledged to be the costliest natural disaster in US history, caused damage that represented only 1-2% of the US national GDP for that year and about 30% of Louisiana's annual GDP (assuming half of the total economic impact was in Louisiana). Furthermore, while Katrina contributed to a short-term reduction in GDP growth at the national level, within six months national GDP growth had increased. Similarly, "Superstorm" Sandy, which caused many deaths and wide-spread destruction in the Caribbean and the northeastern US in 2012 was expected to have only a modest effect on overall US GDP.

Furthermore, the Caribbean region's vulnerability is set against the backdrop of high levels of indebtedness, deep-seated pockets of poverty within countries even among those in which economic growth is robust, and weak performance of the agricultural sector, which is a major employer. Also, the global economic downturn has exacerbated the economic and financial difficulties in Caribbean countries. In 2012, in much of the Caribbean, growth remained constrained by high debt levels and slow tourism activity.

The Caribbean Catastrophe Risk Insurance Facility (CCRIF)

Fortunately, the region is home to a ground-breaking risk transfer mechanism - the Caribbean Catastrophe Risk Insurance Facility (CCRIF), which is the world's first multi-country risk pool providing parametric insurance. CCRIF was designed to limit the financial impact of catastrophic hurricanes and earthquakes by quickly providing short-term liquidity when a policy is triggered.

In fact, it was Hurricane Ivan and the level of devastation wrought throughout the region that led to the formation of CCRIF. Following the passage of Ivan, the Caribbean Community (CARICOM) Heads of Government held an emergency meeting to discuss critical issues surrounding the need for the provision of catastrophe risk insurance for its members.

Consequently, CARICOM resolved to take action and approached the World Bank for assistance to design and implement a cost-effective risk transfer

programme for member governments. This marked the beginning of what would become the Caribbean Catastrophe Risk Insurance Facility.

CCRIF provides tropical cyclone and earthquake insurance for 16 Caribbean governments. The Facility also now

provides insurance against excess rainfall events. Since its inception in 2007, the Facility has made eight payouts totalling US\$32,179,470 to seven member governments on their tropical cyclone (hurricane) or earthquake policies (see table below).

Event	Country Affected	Payouts (US\$)
Earthquake, 29 November 2007	Dominica	528,021
Earthquake, 29 November 2007	Saint Lucia	418,976
Tropical Cyclone Ike, September 2008	Turks and Caicos Islands	6,303,913
Earthquake, 12 January 2010	Haiti	7,753,579
Tropical Cyclone Earl, August 2010	Anguilla	4,282,733
Tropical Cyclone Tomas, October 2010	Barbados	8,560,247
Tropical Cyclone Tomas, October 2010	Saint Lucia	3,241,613
Tropical Cyclone Tomas, October 2010	St. Vincent & the Grenadines	1,090,388
Total for the Period 2007 – 2011		US\$32,179,470

Uniqueness of CCRIF

Under CCRIF's insurance policies, which are parametric in nature, payouts are calculated using a catastrophe risk model (the multi-risk peril estimation system – MPRES) specific to the Caribbean, within which losses are based on characteristics of a natural hazard event (provided by independent sources) and impacts of the hazard (wind and storm surge in the case of tropical cyclones and ground shaking for earthquakes) on pre-defined national exposure. Payouts can be made quickly, without having to wait for a post-event on-site loss assessment. CCRIF makes its payouts within 14 days of an event, enabling governments of affected countries to implement immediate recovery activities and keep the wheels of government turning.

Importantly, CCRIF is able to provide insurance that is affordable to its members through a number of complementary mechanisms. The Facility aggregates disaster risks across the Caribbean, achieving the kind of risk diversification and spreading that its members would not be able to attain on their own. By pooling countries' risks into a single diversified portfolio, CCRIF is able to provide insurance at the minimum price possible. CCRIF also brings economies of scale for administration and purchase of reinsurance. Its capital enables CCRIF to retain some risk, thus reducing the reinsurance burden. The World Bank conservatively estimates that insurance obtained through CCRIF is about half the cost of coverage a member country

could obtain on its own. For CCRIF policies, each country pays a premium directly related to the amount of risk it transfers to CCRIF.

Thus, in CCRIF, Caribbean governments have developed a mechanism which enables them to share their risks (thus keeping premiums as low as possible), with payouts available when most needed. The 16 CCRIF member countries have a total of 29 tropical cyclone and earthquake policies. They have renewed their policies every year since 2007, despite the increasing difficulty in financing premiums due to economic and financial pressures.

Additional vulnerabilities for Caribbean states

As noted above, the Caribbean's small island and coastal states are particularly vulnerable to natural hazards and unfortunately, this vulnerability will be exacerbated by climate change. Climate change is expected to lead to more frequent high-intensity hurricanes, accelerating the erosion of coastal beaches, inundation of low-lying land and loss of protective mangroves – in some islands this is already happening. On the coast, houses, hotels and other buildings, along with roads and other infrastructure, will become increasingly vulnerable, as will be those who live and work there. Climate change is also expected to increase rainfall variability. Greater, and therefore more damaging, precipitation during storms and other peak periods will be juxtaposed with more frequent and longer droughts.



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Findings from a Caribbean study on the Economics of Climate Adaptation (ECA) conducted by CCRIF and partners in 2010 indicated that annual expected losses from wind, storm surge and inland flooding already amount to up to 6% of GDP in some Caribbean countries and that, in a worst case scenario, climate change has the potential to increase these expected losses by 1 - 3 % of the GDP by 2030. This is comparable in scale to the impact of a serious economic recession – but on an ongoing basis. Apart from the social and environmental disruption, the fiscal balance of these states is simultaneously severely undermined. At the national level this translates to cuts in revenue, an increase in the need for spending, worsening public finances and increasing debt. These potential impacts of climate change undoubtedly apply not only to the Caribbean but also to small island developing states in other parts of the world.

In addition to natural factors, there are social conditions common in small states which further increase their vulnerability to natural hazards. For example, rapid and unplanned urban expansion can result in inadequately constructed and dense dwellings, and the growth of informal settlements on steep hill-slopes and river banks

increases the number of people who are particularly vulnerable. Many small island states have inadequate development planning and standards and in some cases, building codes are non-existent or the laws governing these codes are outdated. In addition, even where building codes exist there may be a lack of adequate enforcement. After

Hurricane Sandy passed through Jamaica in 2012 leaving extensive damage, Jamaica's Prime Minister reiterated the need for legislation to prevent building in places at risk of sustaining great damage in the event of natural hazards and signalling a clear need for building codes which, when implemented, will assist in reducing the impacts of these hazards.



Rapid and unplanned urban expansion can result in inadequately constructed and dense dwellings, and the growth of informal settlements in locations on steep hill-slopes and river banks increases the number of people who are particularly vulnerable. Many small island states have inadequate development planning and standards and in some cases building codes are non-existent or the laws governing these codes are outdated.

Role of Risk Transfer Mechanisms

CCRIF is an example of a risk transfer mechanism, and such mechanisms are becoming increasingly important and a key and indispensable component of economic policy and disaster risk management strategies as countries seek to grow their economies, reduce poverty and become internationally competitive. The 16 CCRIF members have demonstrated their belief that the CCRIF model, as an innovative risk transfer option, should be included in disaster risk management strategies of countries that are vulnerable to hurricanes and earthquakes. Also, they recognise that it can be a critical component of a country's climate change adaptation framework.

But CCRIF is not a panacea. CCRIF – and risk transfer – is only one part of the disaster risk management equation. In the Caribbean, we know all too well that we must have allocations in our budget for disaster management and recovery supported by comprehensive disaster management policies and plans. Caribbean countries must – and can – reduce their vulnerabilities to natural hazards by implementing diverse disaster risk management initiatives – thus preventing these hazards from becoming “natural disasters”.

These disaster risk management initiatives can be clustered into two main groups: risk mitigation (or reduction) and risk transfer. Risk mitigation includes measures aimed at reducing damage such as building dykes, retrofitting buildings and enforcing building codes. Risk transfer solutions, such as catastrophic risk insurance offered by CCRIF, are measures aimed at limiting the financial impact for people affected, by distributing the risk to other players in the market. Particularly effective in the case of low-frequency and high-severity events, risk transfer mechanisms are based on transferring part of the risk to a

third party (e.g., an insurance or reinsurance company or the capital market), and include both traditional insurance products and alternative risk transfer instruments (e.g., NatCat bonds).

While reducing current and future risk must be a priority, there is a threshold at which investment in risk transfer is more cost-efficient than risk reduction. This threshold varies from country to country. For example, in some countries only a small share of the expected loss can be expected to be averted cost-effectively using risk mitigation measures. To address the risk beyond this level, it may be economically more effective to purchase a risk transfer solution than to implement further risk mitigation measures. Each country must decide the proportion of its risk management portfolio which should be based on risk mitigation and on risk transfer.

CCRIF as a Model

The success of CCRIF has catalysed other initiatives to bring innovative risk transfer solutions to other sectors of industry and populations at particular risk, for example in the agricultural sector and to support micro-finance lending. One such initiative is the Climate Risk Adaptation and Insurance in the Caribbean Project which is supported by the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU) – a collaborative effort being implemented by the Munich Climate Insurance Initiative (MCII), CCRIF, MicroEnsure and MunichRe. This project aims at protecting the livelihood of low-income people against extreme weather events (specifically, excess rainfall and high winds) – which are expected to be exacerbated by climate change.

Two products are being developed in three pilot countries – the Livelihood Protection Policy (LPP) and the Loan

Portfolio Cover (LPC). Targeted at individuals, the LPP is intended to provide policy holders with funds within a short period of time that would allow them to rebuild their farm, small enterprise and/or livelihood after an extreme weather event. The LPC is intended to provide portfolio-level protection against default for lender institutions such as development banks and credit unions which have significant portfolios of individual and small business loans exposed to weather risks. The LPP was launched in Saint Lucia in May 2013 and provides an innovative solution to protect low-income individuals against weather shocks and can help them adapt to changing risk patterns brought about by climate change. This new and innovative insurance coverage is a clear example of proactive planning for disaster risk management at the individual level and augurs well during these severe fiscal challenges that Caribbean countries are facing.

Also, CCRIF is serving as a model for other regions and discussions on multi-country risk pools and instruments – similar to CCRIF – have taken place in other parts of the world. Efforts to draw up a similar insurance scheme for island nations in the Pacific and Indian oceans are underway and the African Risk Capacity project, which consists of a continental index-based weather risk insurance pool and early response mechanism, draws on the CCRIF model and experiences. Thus, it can be said that the Caribbean Catastrophe Risk Insurance Facility demonstrates the Caribbean region's leadership in the area of disaster risk management.

- Adapted from Lead Discussant Remarks at Commonwealth and Francophonie Outreach with the G20 Development Working Group, International Monetary Fund, Washington, DC, 21 April 2013.



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