DISASTER RISK MANAGEMENT IN THE CARIBBEAN:

The World Bank's Approaches and Instruments for Recovery and Resilience

DECEMBER 5, 2018









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1818 H Street NW Washington DC 20433 Telephone: 202-473-1000 Internet: www.worldbank.org

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ACKNOWLEDGEMENTS

The World Bank Group has been enhancing disaster risk management in countries for over two decades. This note summarizes its approach, focusing on its engagement in the Caribbean, and is intended to spark ideas on potential ways in which the World Bank Group can support governments and organizations in increasing the resilience of countries to the impacts of disasters and climate change.

The note was produced by a team within the World Bank Group's Social, Urban and Rural Global Practice that comprises of Keren Carla Charles (Disaster Risk Management Specialist), Mary Boyer (Disaster Risk Management Specialist), Nicholas Callender (Disaster Risk Management Specialist) and Kerri D. Cox (Senior Knowledge Management and Communications Consultant). The team thanks Rashmin Gunasekera (Senior Disaster Risk Management Specialist) and Mahlet Tsigie (Disaster Risk Management Consultant) for their review and Blue Robin Designs LLC for layout and design of the document.

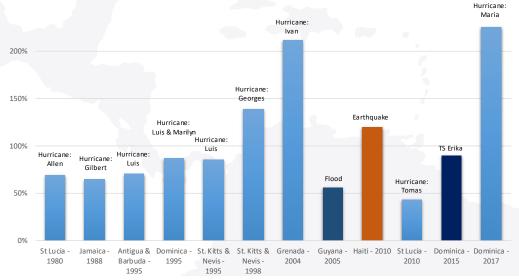
The note was prepared with financial support from the European Union (EU) in the framework of the ACP-EU Natural Disaster Risk Reduction Program, managed by the Global Facility for Disaster Reduction and Recovery.

For more information, please contact Joaquin Toro (Senior Disaster Risk Management Specialist) at jtoro@worldbank.org.

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DAMAGE AND LOSSES FROM SELECT DISASTERS AS A % OF GDP



As a result of natural disasters, about US\$520 billion per year is lost in consumption globally, pushing 26 million people into extreme poverty.1 Within the Caribbean, direct damages due to natural disasters² have averaged almost US\$1.6 billion per year over the last 20 years. This average hides the fact that several years have seen particularly severe events - including the 2010 earthquake in Haiti - that resulted in annual damages exceeding US\$8 billion. The high costs of recovery and reconstruction give rise to high sovereign debts and reduced fiscal space, causing setbacks to hard earned development gains and making it harder for governments to implement poverty reduction policies.

More recently, the 2017 Atlantic Hurricane Season underlined the importance and urgency of adopting and further expanding the approaches and instruments for addressing disaster risk management (DRM). Irma and Maria, two Category 5 hurricanes, hit the Caribbean in the same week, causing severe damages on small island states and territories. Many lives were lost, even though early warning systems and timely evacuations helped save many more. In Dominica, losses and damages amounted to 226% of its gross domestic product (GDP).



Hallegatte, Stephane; Vogt-Schilb, Adrien Camille; Bangalore, Mook; Rozenberg, Julie. 2016. Unbreakable: building the resilience of the poor in the face of natural disasters (English). Climate Change and Development series. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/512241480487839624/Unbreakable-building-the-resilience-of-the-poor-in-the-face-of-natural-disasters

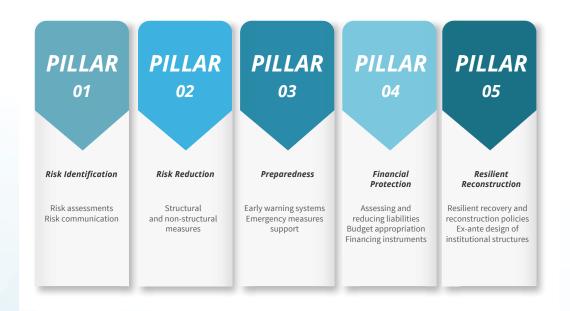
Natural disasters due to meteorological hazards (hurricanes, tropical storms, droughts, floods and landslides) and geological hazards (earthquakes, volcanoes, tsunamis and landslides).

Disaster Risk Management in the Caribbean

Over the past 20 years, natural disasters have directly affected 12 million people in the Caribbean on average, and not a single year has passed in which disasters in the Caribbean have not claimed lives. Existing empirical evidence suggests that natural disasters affect the poor and socially vulnerable disproportionately, as they both have higher sensitivity to disaster events and lower economic ability to cushion or recover from the negative impacts of such events once they occur.

The World Bank Group's (WBG's) approach to natural disasters has evolved significantly over the last twenty years. While earlier WBG assistance was predominantly focused on recovery and reconstruction, the approach has broadened extensively to provide technical and financial support to countries for comprehensive, multifaceted DRM. Likewise, the WBG's annual Disaster Risk Management (DRM) investment has increased steadily over the past six years – from US\$3.7 billion in fiscal year (FY) 2012 to US\$5.3 billion in FY 2018. All WBG projects are now screened for climate and disaster risk to ensure that they build the resilience of people on the ground.

STRATEGIC PILLARS OF DISASTER RISK MANAGEMENT Institutional, Political, Normative, Financial Context

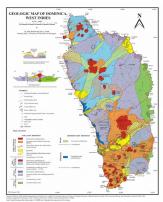


This note summarizes the instruments and tools for comprehensive DRM that the WBG has developed to help governments assess risk, finance risk, reduce risk, prepare for and recover from disasters. It also highlights examples of the WBG's work across the Caribbean region.

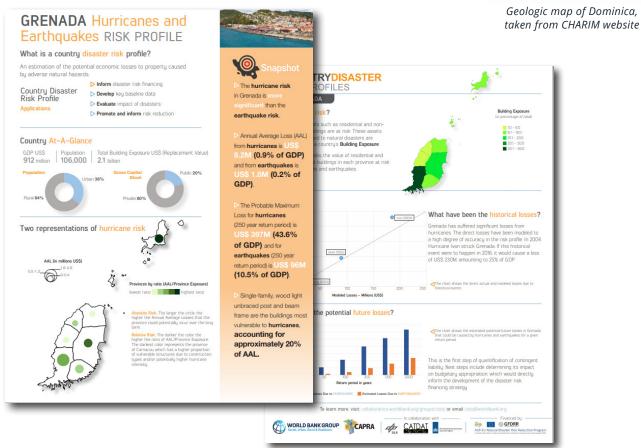
RISK IDENTIFICATION

Risk assessment informs risk identification, risk reduction, preparedness, territorial planning, financial protection, and resilient reconstruction. Assessments provide the foundation for DRM and decision making in multiple sectors by quantifying the effects of disasters in terms of potential casualties and asset losses. The wide selection of tools, policies, and programs available to manage disaster risk all depend on an accurate assessment of current and future risks, over a range of time scales. To successfully incorporate risk management into development strategies, the WBG has developed a cadre of experts specialized in risk assessment, as well as tools such as:

- The Caribbean Handbook on Risk Information Management (CHARIM) which has supported Caribbean
 government clients in generating landslide and flood hazards information, developing hazard mapping
 studies, and using these studies for disaster risk reduction planning and infrastructure improvements.
 An on-line handbook was developed to support the generation and application of landslide and flood
 hazard and risk information to inform projects and programs within the planning and infrastructure
 sectors, specifically targeted to small countries in the Caribbean region.
- Country Disaster Risk Profiles (CDRPs) that estimate the potential economic losses to property caused by natural hazards. CDRPs have been prepared for Belize, Dominican Republic, Grenada, Haiti, Jamaica and Saint Lucia and have been used extensively for informing these countries disaster risk financing strategies.



GRENADA COUNTRY DISASTER RISK PROFILE



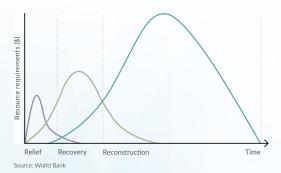
DISASTER RISK FINANCE

Disaster Risk Finance (DRF) aims to reduce the economic and fiscal impact caused by disasters, based on the concept of cost-effectiveness, that is to say, to develop instruments differentiated according to the different types of risks identified. To this end, a DRF strategy combines instruments for the retention and transfer of risk and administrative and legal mechanisms to increase the capacity to respond effectively and reduce the associated financial burden and, ultimately, to ensure the sustainability of public finances. From a macroeconomic point of view, the various instruments forming the strategy play the role of automatic stabilizers and help manage budgetary volatility caused by disasters.

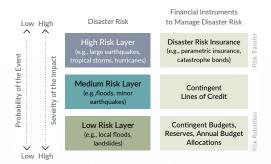
ELEMENTS OF A DISASTER RISK FINANCING STRATEGY



Legal and institutional frameworks that allow for quick disbursement of funds



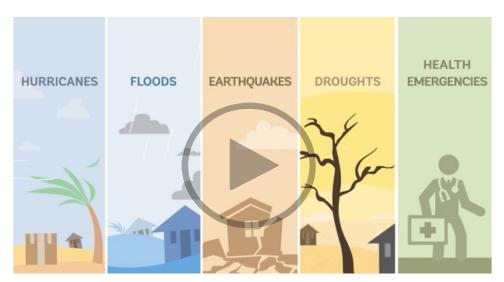
Resources that can be made available at various stages of the post-disaster cycle (e.g. relief, recovery and reconstruction)



Instruments differentiated and tailored to the types of risks identified in the country

- Caribbean Disaster Risk Financing Technical Assistance (DRFTA) aims to strengthen governments' capacity to reduce the fiscal shock of disasters by quantifying governments' contingent liabilities to disasters; recommending public financial management (PFM) and regulatory reforms; and evaluating the resilience of the domestic insurance market to disasters. Through collaboration with Ministries of Finance (MoFs) of Belize, Grenada, Jamaica and Saint Lucia, customized solutions have been developed based on national priorities and economic contexts. The recommendations and analyses from this activity (final reports) have served as inputs to the International Monetary Fund's (IMF's) Climate Change Policy Assessment papers, national fiscal policy papers, and analytics for development of contingent lines of credit. More broadly, governments are using the reports for policy dialogues, facilitating their discussions with donors and multi-lateral agencies.
 - The Saint Lucia DRFTA report has led to Saint Lucia being the first Caribbean country to approve, through Cabinet, a National Disaster Risk Financing Strategy.
 - The Jamaica DRFTA has led to discussions on finding solutions to cost effectively insure public assets through collaboration with the private sector.

Due to its initial success in Belize, Grenada, Jamaica and Saint Lucia, and regional demand to engage with more of the Caribbean Community (CARICOM), the DRF TA has secured financing to expand geographically to remaining CARICOM and Caribbean Overseas Territories. Expansion of the technical assistance will occur at the request of MoFs.



Video on the Caribbean Disaster Risk Financing Technical Assistance Project

Here are some potential DRF instruments:

- Contingency funds. Contingency funds can be embedded in the country's budget as part of a fiscal rule associated with a savings fund, or they can be extra-budgetary funds managed by the government. Whatever the arrangement, these funds should have sound and transparent administrative and disbursement procedures related to the occurrence of a disaster. Such a contingency fund can be capitalized by a share of the fiscal surpluses generated by the fiscal rule. The WBG is supporting several countries in developing clear guidelines for the use, governance and establishment of an accountability framework for the contingency fund specifically ring-fenced for disaster response.
- Development Policy Financing with Catastrophe Deferred Drawdown Options (Cat DDO). The Cat DDOs combine the provision of immediate liquidity following a disaster with requirements for a disaster risk reduction policy program. As a policy instrument, the Cat DDO engages countries in high level dialogues about vulnerability reduction and resilient development, supporting governments in developing integrated risk management strategies and investments that go beyond disasters. As a contingent financing instrument, Cat DDOs provide much-needed financing after major natural catastrophes. The first Cat DDO in the Caribbean was approved in September 2017, providing a US\$150 million contingency loan to the Dominican Republic.
- Risk insurance and cat bonds. In addition to the WBG's own financing instruments, the WBG also supports client countries in accessing the financial markets for contingent credit and risk transfer solutions, such as parametric insurance or Cat bonds. The WBG is currently assisting the Government of Jamaica in exploring the feasibility of similar risk transfer instruments.
- Regional catastrophe risk pools. The Caribbean Catastrophe Risk Insurance Facility (CCRIF), established
 with support from the WBG in 2007, is the first multi-country risk pool in the world, and the first
 insurance instrument to successfully develop parametric policies backed by both traditional and capital
 markets. It was designed as a regional catastrophe fund for Caribbean governments to limit the financial
 impact of hurricanes, earthquakes, and excess rainfall by quickly providing financial liquidity when a
 policy is triggered. Over 17 countries are now members of CCRIF.

RISK REDUCTION

The WBG has provided more than US\$576 million in lending and over US\$13 million in Technical Assistance through the Global Facility for Disaster Reduction and Recovery (GFDRR) to increase resilience in the region. The WBG's strategic approach builds resilience by improving understanding of risks and risk mitigation measures; improving infrastructure; increasing risk financing options; informing policies to mainstream resilience and improving preparedness levels. Examples of our engagements are listed below:

• Resilient infrastructure. The Bank is supporting the implementation of disaster risk reduction and climate change adaptation in 10 Caribbean countries³. These projects are comprised of investments aimed at enhancing the resilience of critical infrastructure through retrofitting, rehabilitation or reconstruction. The activities under these projects are informed by vulnerability analysis, stakeholder consultations, economic analysis and political decisions. The projects in the Eastern Caribbean leverage additional financing from the Climate Investment Funds through the Pilot Program for Climate Resilience in order to pilot innovative climate adaptation and mitigation solutions. The projects also include TA aimed at building institutional capacity to manage risks and large infrastructure projects.



- Resilient housing. The Housing Recovery Project for Dominica contributes to both the recovery of
 housing for households affected by Hurricane Maria and the improvement of resilient building practices
 in the housing sector. In addition, the Climate Adaptation Financing Facility in Saint Lucia provides
 concessional loans to households and small businesses to implement climate resilient interventions.
 The WBG is also providing technical support to Caribbean countries, such as Jamaica and Haiti, to
 strengthen their building codes and their application, as well as disseminate resilient construction
 practices.
- Resilient transport. The Resilient Transport Program is an ongoing engagement in Dominica and Belize
 to strengthen the resilience of roads and bridges. In Dominica, a risk-based asset management system
 was developed to continuously assess road infrastructure conditions, conduct a vulnerability assessment
 of the road network to natural disasters and prepare a multi-year investment action plan. The system
 consists of a decision support tool for risk estimation, evaluation and optimized decision making under
 budget constraints, a geographical information system for spatial outputs, and management information
 capabilities to produce fit-for-purpose reports that align with business objectives. Other such programs
 focus on resilient energy systems, resilient cities and the strengthening of building practices.

Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, Sint Maarten and Saint Vincent and the Grenadines (SVG)

- Resilient cities. Caribbean cities are challenged with aging infrastructure, housing deficits, poor traffic management, lack of or inefficient public services, inadequate solid waste systems, informal settlements and high risk to natural shocks. In attempts to address these problems head-on, governments are crafting policies, implementing programs and engaging development partners on ways to strengthen their cities to attract more tourism revenue, increase economic growth and improve the quality of life. The WBG is working with countries, such as Saint Lucia and SVG, to transform and develop cities to be more resilient and inclusive, to catalyze economic growth, and to promote innovations. The WBG is also supporting Cap-Hatien, Haiti in strengthening its resilience to natural disasters, through flood risk reduction investments, paired with risk-based urban planning and management.
- Resilient policies. The WBG has been working with countries to mainstream DRM and improve
 governance structures to manage disaster and climate risks by supporting the technical inputs into
 national legislation and policies. Examples include: national physical development policies, national land
 policies, national urban and housing policies, national spatial data infrastructure plans, and disaster risk
 finance strategies.
- DRM as a tool for climate change adaptation. The WBG, through the Disaster Vulnerability Reduction Projects (DVRPs), is supporting the development of climate change adaptation policies, strategies, and implementation plans. Furthermore, a curriculum for climate change adaptation and DRM is under development in St. Vincent and the Grenadines. The preparation of a comprehensive integrated watershed management policy and action plan is also under preparation. In Belize, the National Climate Resilience Investment Plan (NCRIP) has been fully adopted by the Government of Belize, resulting—for the first time—in climate change-related impacts being integrated into national investment planning across all sectors and ministries
- DRM as a tool for adaptive social protection. Social assistance, through cash transfers and other safety nets, has been critical to reducing poverty and improving household resilience. Adaptive social protection refers to programs that build the resilience of poor and vulnerable households to shocks, so they are better able to absorb, respond and adapt to the impacts of natural disasters, climate change, conflict, and economic shocks, among others. In Saint Lucia, the WBG supported the revision of the Social Safety Net program to better target households more vulnerable to socio-economic and natural disaster shocks. In Grenada and SVG, the WBG supported the integration of DRM into social protection instruments and trained social protection practitioners on DRM principles. In SVG, the WBG also developed an innovative approach to evaluating social protection and DRM risk in an integrated manner that incorporates structural vulnerability with socio-economic vulnerability.

PREPAREDNESS

Effective disaster preparedness can save lives and livelihoods.

- Emergency preparedness and response. The WBG works with cities and Governments at national and sub-national levels to assess emergency preparedness and response (EP&R) capacities based on the jurisdiction's legal and institutional frameworks, personnel, facilities, equipment and information. The objective is to improve efficiency, avoid duplication of efforts and enhance the benefits of collaboration among key Government and emergency relief entities. The outcome is a proposed investment roadmap, including a strategic plan to guide the strengthening of the EP&R systems and inform future investments Throughout the Caribbean, our DRM projects are supporting construction and rehabilitation of emergency shelters. In addition, in Haiti, WBG is training community volunteers organized in local Civil Protection Committees in early warning preparedness and response action.
- Contingency planning. The WBG works with stakeholders to map out, enhance and streamline response
 procedures, particularly in preparation of the Contingency Emergency Response Component, which is
 embedded in projects throughout the region. The CERC was triggered in Dominica to disburse US\$7 million
 to support 4,100 farmers and fisherfolk in the rehabilitation of their properties and re-establishment of
 their crop cycles. The CERC was also triggered in SVG following the December 2013 excessive rainfall
 event.

- Hydromet services and early warning systems. Early warning systems are highly effective at reducing losses. The WBG is currently supporting more than 40 countries, including the Caribbean countries of Grenada, Haiti, Saint Lucia and SVG, in strengthening their capacity to monitor and forecast hazards and early warning systems. With support from GFDRR, the Hydromet Initiative aims to foster links between the WBG and partner institutions such as the World Meteorological Organization (WMO) and National Meteorological Agencies to promote a culture of joint learning with partner countries.
- In addition, GFDRR and the WBG, in partnership with the United Nations Office for Disaster Risk Reduction (UNISDR) and WMO, launched the Climate Risk and Early Warning Systems (CREWS) initiative in 2015. This initiative aims to strengthen multi-hazard early warning systems in Small Island Developing States and the world's Least Developed Countries. CREWS has committed over US\$15 million to finance weather stations, radar facilities, and early warning systems in poor and vulnerable countries where weather data is unreliable or lacking. A CREWS program to strengthen early warning systems in the Caribbean is currently under implementation.
- In Saint Lucia, a Road Map for Strengthening Operational Weather, Water, and Climate Services was prepared. This road map included an analysis of the capacities of the main hydrological and meteorological (hydromet) agencies in Saint Lucia in providing necessary data and information for essential forecasting.



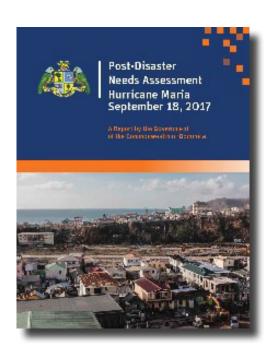
• "Adaptive" safety nets. Building on existing cash transfers or public works programs – adaptive safety nets are designed to enable rapid and targeted scale-up following a disaster. By relying on existing social infrastructure, they are aimed at breaking and preventing the vicious cycle of poverty as well as saving money for governments, donors, and tax payers at a critical time. Because these systems are flexible and fast, they can reach people in affected areas and prevent last resort coping measures such as cutting down on food or taking children out of school. Ongoing WBG efforts in the Caribbean are building on these examples – for instance by supporting Jamaica in implementing a social protection system for strengthening disaster preparedness and response and supporting Saint Lucia in creating a disaster-responsive targeting system for social protection schemes.

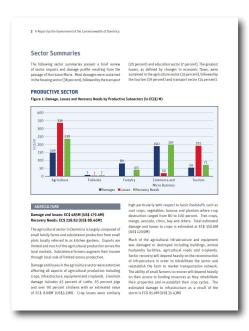
RESILIENT RECOVERY

With all their negative effects, disasters offer a unique opportunity to rebuild better and stronger to enable resilient and more productive societies that can withstand future shocks. This concept is at the core of all WBG-funded reconstruction programs ensuring that: new buildings are located outside flood zones and that structures are designed to resist high winds and ground acceleration; roads, bridges, and electric grids are able to endure the next storm and earthquake; and that new settlements can provide a better quality of life and enable higher productivity. For example, the WBG manages the US\$580 million Recovery and Resilience Trust Fund, established in April 2018 and financed by the Government of The Netherlands, to help Sint Maarten build back better and increase resilience following the devastation caused by Hurricane Irma.

The WBG supports recovery and reconstruction efforts in the following ways:

• Post-Disaster Needs Assessments (PDNA): In the aftermath of disasters, WBG teams are deployed to support the governments of affected countries in PDNAs to assess the scale of the damage and the needs for recovery. A tripartite agreement between the WBG, United Nations (UN), and European Union (EU), signed in 2007, establishes a clear protocol and methodology for the conduct of such assessments. PDNAs are used to help guide both governments and donors in reconstruction to determine which sectors to support and resources to engage. Past experiences in providing countries with reconstruction plans and frameworks have been compiled in a Disaster Recovery Frameworks guide, that is used by operational teams and affected governments to design reconstruction operation. Following Hurricanes Irma and Maria in 2017, the WBG led and collaborated with UN, EU, Caribbean Disaster Emergency Management Agency, the Caribbean Development Bank and the Eastern Caribbean Central Bank in conducting PDNAs for Antiqua and Barbuda and Dominica.





• Emergency operations: These operations are designed to address recovery and reconstruction needs resulting from a disaster. In recent years, these operations have been used repetitively in the Caribbean, for instance in the Dominican Republic to restore and strengthen priority electric, water and sanitation infrastructure damaged by tropical storms Olga and Noel; to support SVG and Saint Lucia following Hurricane Tomas in 2010; as well as in Haiti after Hurricane Matthew in 2016.

• Trust funds and fiscal intermediary funds: The WBG also acts regularly as a fiduciary agent to help mobilize, coordinate, and channel reconstruction financing from a variety of sources. These can take the form of single or multi-donor trust funds through which donors entrust the WBG with resources for pre-agreed activities. In case of large reconstruction programs, the WBG has, in some cases, established Fiscal Intermediary Funds, allowing for donors' resources to be channeled to other intermediary agents such as the Inter-American Development Bank or the UN. This was the case after the Haiti Earthquake of 2010 when the WBG established the Haiti Reconstruction Fund which has channeled over US\$400 million in funding implemented through a variety of partners.

WORLD BANK FINANCING INSTRUMENTS

The Bank has an array of instruments to meet the needs of countries, including

- Investment Project Financing provides IBRD loans and guarantee financing to governments for activities that create the physical/social infrastructure necessary to reduce poverty and create sustainable development.
- Development Policy Financing provides IBRD loans and guarantee budget support to governments for a program of policy and institutional actions to help achieve sustainable, shared growth and poverty reduction.
- Program-for-Results links disbursement of funds directly to the delivery of defined results, helping countries improve the design and implementation of their own development programs and achieve lasting results by strengthening institutions and building capacity.
- Trust funds and grants allow scaling up of activities and enable the WBG to provide technical support; provide immediate assistance in response to natural disasters and other emergencies; and pilot innovations that are later mainstreamed into our operations."



