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Abbreviations and Acronyms

AAL	Average Annual Loss
Cat DDO	Catastrophe Deferred Drawdown Option
CCRIF SPC	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company
CDRP	Country Disaster Risk Profile
CoA	Chart of Accounts
DaLA	Damage and Loss Assessment
DRF	Disaster Risk Finance
DRFIP	World Bank Disaster Risk Financing and Insurance Program
DRFTA	Disaster Risk Finance Technical Assistance
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DVRP	Disaster Vulnerability Reduction Project
ECLAC	Economic Commission for Latin America and the Caribbean
EoE	Estimates of Expenditure
FAA	Financial Administration and Audit Act
FINSAC	Financial Sector Adjustment Company
FPMU	Fiscal Policy Management Unit
FRF	Fiscal Responsibility Framework
FSC	Financial Services Commission
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Risk Reduction
GoJ	Government of Jamaica
GSURR	Global Practice for Social, Urban and Rural Resilience
IAJ	Insurance Association of Jamaica
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPSA	International Public Sector Accounting Standards
JLIC	Jamaica International Insurance Company
JSIF	Jamaica Social Investment Fund
LAC	Latin America and Caribbean
LPP	Livelihood Protection Policy
MoAF	Ministry of Agriculture and Fisheries
MoFP	Ministry of Finance and Planning
NDC	National Disaster Committee
NDF	National Disaster Fund
NIS	National Insurance Scheme
OAS	Organization of American States
ODPEM	Office of Disaster Preparedness and Emergency Management
PATH	Program for Advancement through Health and Education
PEFA	Public Expenditure and Financial Accountability
PIOJ	Planning Institute of Jamaica
PML	Probable Maximum Losses
PPP	Public-Private Partnership
SIDS	Small Island Developing States
SP	Social Protection
TFFS	Task Force on Finance and Statistics
TGL	Treasury General Ledger
ToR	Terms of Reference
TSA	Treasury Single Account
UNDP	United Nations Development Programme
USAID	U.S. Agency for International Development
USD	United States Dollar

Glossary

Contingent liabilities: Are obligations that may or may not come due, depending on whether particular events occur. The probability of their occurrence may be exogenous to government policies (for example, if they are related to natural disasters) or endogenous (for example, if government programs create moral hazard).

Explicit contingent liabilities: Are specific obligations, created by law or contract, that governments must settle.

Implicit contingent liabilities: Represent moral obligations or burdens that, although not legally binding, are likely to be borne by governments because of public expectations or political pressures.

Damage: Total or partial destruction of physical assets existing in an affected area.

Note: Damage occurs during and immediately after a disaster and is measured in replacement value of assets (based on e.g., percentage of housing damaged, kilometers of roads).

Disaster risk financing (DRF) strategies: Strategies to protect governments, businesses, and households from the economic burden of disasters.

Note: DRF strategies can include programs to increase the financial capacity of a state to respond to a disaster impact or an emergency, while protecting the fiscal balance. They can also promote the deepening of insurance markets at a sovereign and household level and social protection strategies for the poorest.

E.g., the Livelihood Protection Policy (LPP) in Jamaica insures low-income individuals from wind and excess rain and the Government of Grenada disburses National Insurance Scheme (NIS) funds in response to post-disaster short-term unemployment.

Exceedance probability: Probability that a given loss from an event will be equaled or exceeded.

Economic loss: Total economic impact that consists of direct economic loss and indirect economic loss.

Direct economic loss: The monetary value of disaster damages.

E.g., Hurricane Dean caused damages in Jamaica in 2007, with direct economic losses that amounted to USD 62 million (J\$ 8 billion) in public assets.

Indirect economic loss: Monetary value of the consequence of direct economic loss and/or human and environmental impacts. Indirect economic loss includes micro-economic impacts (e.g., revenue declines from business interruption), meso-economic impacts (e.g., revenue declines from supply chain impact or temporary unemployment), and macro-economic impacts (e.g., price increases, increases in government debt). Indirect economic losses can occur inside or outside of the hazard area and often with a time lag.

E.g., the indirect losses caused by Hurricane Dean in 2007 in Jamaica amount to USD 267 million (J\$ 34 billion). Adding the direct economic losses of USD 62 million (J\$ 8 billion), Hurricane Dean accounted for USD 329 million (J\$ 42 billion) in economic loss.

Facultative reinsurance: A type of reinsurance contract that covers a single risk. Facultative reinsurance is one of the two types of reinsurance contract transaction, with the other type being treaty reinsurance. Facultative reinsurance is considered to be more transaction-based than treaty reinsurance.

Fiscal risk: The possibility of deviations in fiscal variables from what was expected at the time of a budget or other forecast. Fiscal risks include macro-economic shocks and contingent liabilities.

E.g., Jamaica has high fiscal risks to disasters: Losses modeled by the Caribbean Catastrophe Risk Insurance Facility (CCRIF) for tropical cyclone events show that a 1-in-100-year event could result in an economic loss of at least USD 3 billion (J\$ 386 billion).

Mean return period/rate of occurrence: Estimate of the likelihood of the loss of a particular event to occur, such as a particular amount of loss from a hurricane or earthquake. It is also the reciprocal of the rate of occurrence of a loss. If the loss associated with a given hurricane wind speed has a 0.01 annual rate of occurrence, the return period is equal to $1 \div 0.01 = 100$ years. This does not imply that the loss from a wind speed will be exceeded exactly once every 100 years, rather that the average time between exceedances is 100 years.

Risk reduction: Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and environment.

Parametric insurance: Payout is made based on the occurrence of an event, not the magnitude of the resulting loss. As such, trigger mechanisms must be devised to determine whether such an event has occurred and if payment under a parametric insurance contract is required. Triggers may be based on:

A pure parametric nature: Trigger is based solely on weather recordings like wind speed or rainfall amount (e.g., LPP is a policy launched in Jamaica, Saint Lucia, and Grenada that insures low-income individuals from wind and excess rain).

A parametric index or model: Trigger is based on a formula, index, or model as a proxy for the actual event (e.g., in the case of CCRIF, payouts are proportional to the estimated impact of an event on each country's budget. The estimated impact is derived from a probabilistic catastrophe risk model developed specifically for the Facility).

Proportional insurance: The reinsurer, in return for a predetermined portion or share of the insurance premium charged by the ceding company, indemnifies the ceding company against a predetermined portion of the losses and loss adjustment expenses of the ceding company under the covered insurance contract or contracts.

Executive Summary

The objective of this report is to make recommendations for the Government of Jamaica (GoJ) for the formulation of a country-specific comprehensive disaster risk finance (DRF) strategy, based on the assessment of the legislative, financial management, fiscal, and insurance market environment in Jamaica. This report is envisioned to be used as a planning tool for the potential development of a comprehensive DRF strategy that would equip the Ministry of Finance and Planning (MoFP) with information and instruments to manage contingent liabilities posed by natural disasters.

On average, in the long term, the GoJ would need to cover losses of approximately USD 121 million (J\$ 16 billion) annually, or 0.84 percent of Jamaica's 2015 gross domestic product (GDP) to address its contingent liabilities related to hurricanes and floods¹ (Table 1). This amount is also equivalent to 3.09 percent of total government expenditures in 2016.² Hurricane damage to public and private building infrastructure alone will amount to USD 67 million (J\$ 9 billion) on average each year in the long run.³ In addition to long-term impacts on economic and social development in Jamaica, disasters also increase Jamaica's sovereign debt, as more loans are borrowed to finance unplanned post-disaster expenditures.

Table 1: Modeled Loss Metrics for Key Return Periods

(all figures in USD million)

Return Period (Years)	Probabilistic Modeling of Building Losses (Hurricane)	Actuarial Analysis of Historic Events, Floods, and Hurricanes		
	Total Direct Damage	Total Direct and Indirect Impact	Total Direct Damages	Total Government Contingent Liability
Average Annual Loss (AAL)	67	300	223	121
10	27	317	238	131
50	953	2,785	1,973	1,057
100	1,870	4,734	3,347	1,729
250	3,468	7,304	5,155	3,276

Source: Authors' analysis.

Jamaica can adjust its approach to disaster financing to be more timely and cost-effective and to minimize opportunity costs. Funds for short-term disaster relief and some recovery expenditures are currently re-allocated from existing recurrent or capital expenditures and accounted for in a budget supplementary. The GoJ is forced to reallocate funds from essential development activities to crisis response. Financing for long-term reconstruction takes the form of official development assistance, largely loans, secured on an ad hoc basis after disaster strikes, further limiting fiscal space and exacerbating the country's public debt problems.

Existing instruments for DRF are not optimized to address Jamaica's disaster risk profile, prone to high- and low-frequency natural hazards. The National Disaster Fund (NDF) is the main budget instrument for the GoJ to finance public post-disaster expenditures, and it is capitalized at USD 2 million (J\$ 258 million) as of March 2015.⁴ A Contingencies Fund, established in the Constitution and capitalized at USD 825,000 (J\$ 106 million) in 2014, can be disbursed for unforeseen expenditures like natural disasters, but as of September 2017, there have been no payments made for weather-related events.

¹ Authors' analysis, based on probabilistic modeling and historic losses, explained in Chapter 3.

² International Monetary Fund (IMF). 2017. *World Economic Outlook*.

³ World Bank Country Disaster Risk Profile, Jamaica, 2016.

⁴ Office of Disaster Preparedness and Emergency Management (ODPEM) Annual Report 2014–2015.

The Contingencies Fund has primarily been accessed for retroactive salary payments and pensions. Jamaica is also a member of the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC).

This report presents recommendations for a cost-effective natural DRF strategy in Jamaica, drawing heavily on international experience, country-specific information, and similar conditions in highly indebted small island developing states (SIDS). These complementary resources for a national DRF strategy are based on a preliminary fiscal risk analysis and a review of the current public financial management of natural disasters in Jamaica and the country’s domestic non-life insurance industry. The report benefits from the approach outlined in the World Bank’s operational disaster risk financing and insurance framework,⁵ which has been used in several countries (Belize, Colombia, Fiji, Grenada, Indonesia, Mexico, Pakistan, the Philippines, Saint Lucia, Samoa, Solomon Islands, Sri Lanka, Tonga, Vanuatu, and Vietnam) to assist with the design and implementation of sovereign catastrophe risk financing strategies. This report tailors the approach to the institutional, social, and economic characteristics of Jamaica.

The following chapters outline combinations of new, existing, and refurbished risk retention and risk transfer instruments that could help the GoJ increase its immediate financial response capacity against natural disasters and better protect its fiscal balance. The DRF tools and approaches that Jamaica has accessed in the past are listed below (Table 2). Some are the result of ex ante planning and some materialize after a disaster (ex post).

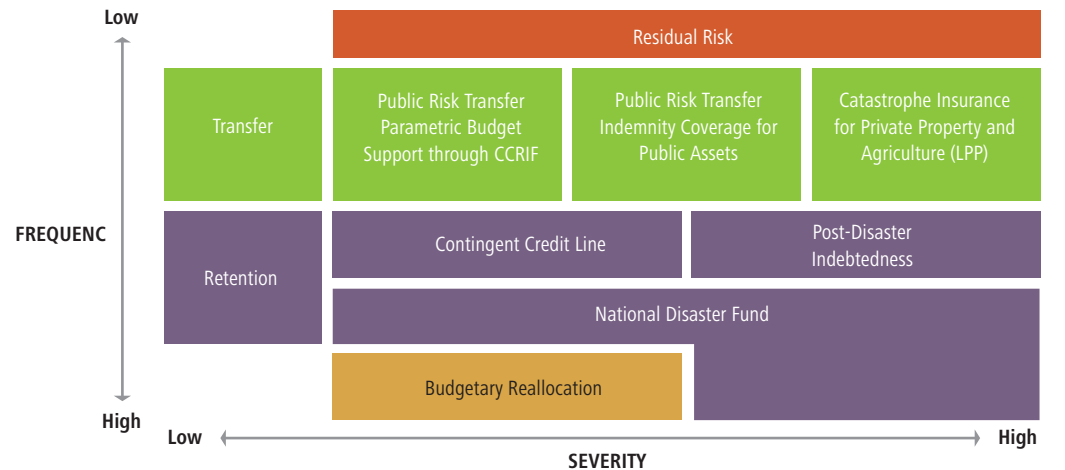
Table 2: Current and Past Disaster Risk Finance Instruments

Ex Ante	Retention	Contingencies Fund NDF, Jamaica Social Investment Fund (JSIF)	
	Transfer	Explicit Contingent Liabilities	CCRIF
		Implicit Contingent Liabilities	Private Property Insurance
Ex Post	Retention	International Loans and Assistance PATH, NIS Budget Reallocation	

Source: Authors.

Building on the risk layering approach promoted by the World Bank for events of varying frequency and severity, based on existing instruments identified in the diagnostic analysis, the following options for a DRF strategy are proposed (Figure 1) and more-detailed recommendations are listed in Table 3.

Figure 1: Illustrative Strategy for Proposed DRF Options



CCRIF = Caribbean Catastrophe Risk Insurance Facility; LPP = Livelihood Protection Policy;
Source: Authors’ analysis.

5 Financial Protection against Natural Disasters: From Products to Comprehensive Strategies, An Operational Framework for Disaster Risk Financing and Insurance. 2014. World Bank Group

Table 3: Strategy Recommendations for DRF in Jamaica

Time Frame	Instrument and Strategy Recommendations for DRF
Sovereign Protection	
Short Term	1. Streamline and institutionalize a damage and loss data collection and reporting system across ministries for all severities of events.
	2. Streamline reporting of disaster relief, recovery, and response expenditures.
	a. Use the current Program for Disaster Management uniformly and consistently in the Revised Chart of Accounts to more accurately track post-disaster spending.
	b. Review Treasury General Ledger (TGL) to facilitate use of country systems by international development partners.
Short/Medium Term	3. Develop an inventory of public assets.
	a. Review the legal definition of contingent liabilities.
	b. Integrate explicit contingent liabilities in budgetary planning process based on potential losses to natural disasters.
	c. Apply rule for accounting of contingent liabilities based on International Public Sector Accounting Standard (IPSAS) standards*
Short Term	4. Codify or approve a DRF strategy.
	a. Prepare a manual for post-disaster financing to accurately capture the actors, the systems, the various sources of financing, and the process to disburse funds and budget execution.
	5. Increase contingency reserves through the NDF for public contingent liabilities associated with events with a 5-year return period
	a. Establish safeguards to ensure appropriate funds in the NDF and appropriate fund management.
	b. Conduct an audit of the NDF to ensure that all funds for short-term disaster financing have been transferred to the NDF.
	c. Establish or re-establish a mechanism for the rapid disbursement of financing of post-disaster expenses through Regulation 7 of the Financial Administration and Audit Act (FAA).
Medium Term	6. Engage external development partners in establishing a contingent line of credit, to finance public contingent liabilities associated with events a 10-year return period.
	7. Establish a robust catastrophe risk insurance program for public assets and parastatals.
Long Term	8. Enhance management of implicit contingent liabilities related to social protection (SP).
Long Term	9. Explore diaspora bond and catastrophe bond markets.
Private Insurance Market	
Medium Term	10. Enhance availability, penetration, and affordability of private and residential catastrophe insurance, for example, through public-private partnerships (PPPs), and micro-insurance schemes, for example, through the Livelihood Protection Policy (LPP).
	11. Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for smallholder farmers.

* GoJ was slated to adopt IPSAS in 2007 based on 2007 Public Expenditure and Financial Accountability (PEFA) Final Report. This was the last public PEFA report and progress on IPSAS is unclear.

The above recommendations would allow the GoJ to finance its contingent liabilities from a flood or hurricane event with a 20-year return period with its own funds without reallocation or further indebtedness, other than drawing down on a contingent financing mechanism (based on the fiscal analysis discussed in Chapter 3). The combination of reserves, emergency financing from a contingent line of credit, and parametric insurance offers a cost-effective strategy. With the addition of indemnity insurance for public assets, coverage could be even more effective. Reserves and/or annual budget allocations are efficient to finance recurrent low-severity events like localized floods, storms, or landslides. Lines of contingent credit such as the World Bank Catastrophe Deferred Drawdown Option (Cat DDO), the Inter-American Development Bank (IDB) Contingent Credit Facility for Natural Disaster Emergencies or the International Monetary Fund (IMF) Rapid Credit Facility (RCF) are more cost-effective than risk transfer solutions for the intermediate layers of risk like tropical storms and low-intensity hurricanes. Catastrophe risk transfer solutions like parametric insurance have proven to be cost-efficient against high-risk layers like major hurricanes and earthquakes.

The GoJ could support the establishment of a disaster risk insurance program for key public assets in partnership with the private insurance industry. Most of the public assets, including critical assets such as hospitals and schools, are not currently insured against natural disasters. The first step in designing a catastrophe insurance program for public assets would involve a national inventory of public assets. Such an inventory can also be used to inform the national cadaster and property tax records. Standardized terms and conditions for the property insurance policies would be developed, which would assist public managers in identifying their risk exposure and their insurance needs. The program could also build a national insurance portfolio of public assets that could then be placed on the private (re)insurance market. A national property catastrophe insurance program for public assets would create economies of scale and diversification benefits and thus lower reinsurance premiums.

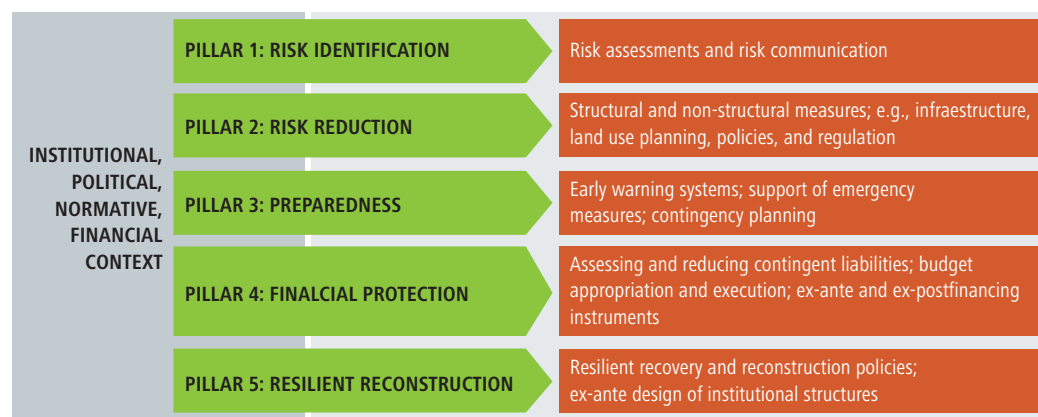
Chapter 1

Chapter 1. Introduction

Brief Presentation of the Theoretical Framework of Disaster Risk Finance

Financial management of disaster risk is an element of Priority 3 of the Sendai Framework 2015–2030⁶ and is part of the Strategic Framework for Comprehensive Risk Management of Disasters developed by the World Bank.⁷ This report defines the five pillars of a disaster risk management (DRM) strategy (see Figure 2). It assumes that while a country cannot escape the risk of natural hazards, it can significantly and efficiently reduce its vulnerability and its exposure to risks. Thus, to reverse the current trend of increasing impacts from natural disasters, it is necessary to integrate risk management into development plans and into public and private investment, both locally and nationally.

Figure 2: Strategic Pillars of DRM Developed by the World Bank



Source: World Bank and GFDRR, Sendai Report.

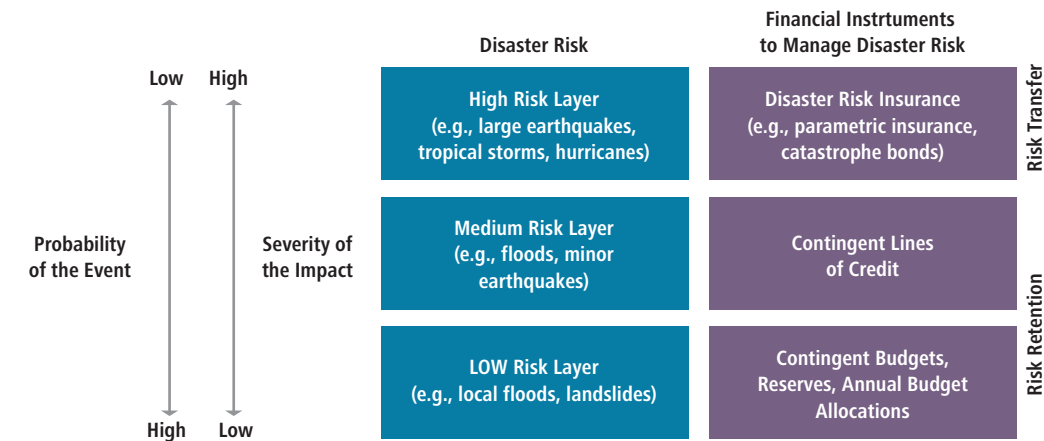
It is important to note that the Disaster Risk Finance Technical Assistance (DRFTA) Project on which this report is based focuses solely on the financial protection pillar. However, it does not lessen the need to strengthen the other dimensions of integrated risk management, including the prevention component that is crucial for Jamaica. The DRFTA Project is part of the broader partnership with the GoJ on DRM and climate change adaptation. Jamaica is currently implementing the World Bank-funded Disaster Vulnerability Reduction Project (DVRP – P127226), which aims to reduce physical and fiscal vulnerability to disasters and the impacts of climate change through a combination of infrastructure works and technical assistance activities that increase capacity to identify and manage climate and disaster risk.

The primary objective of a DRF strategy is 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 (Figure 3). 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 macro-economic point of view, the various instruments forming the strategy play the role of automatic stabilizers and help manage budgetary volatility caused by disasters. Within these tools are the ex ante instruments put in place by the GoJ prior to the disaster and the ex post measures operationalized after a disaster.

⁶ The Sendai Framework for Disaster Risk Reduction 2015–2030 was adopted by 187 states and international actors in March 2015 and establishes a roadmap and priorities for disaster risk reduction (DRR).

⁷ This report details the disaster management framework developed by the World Bank. It is available online at: https://www.gfdr.org/sites/default/files/publication/Sendai_Report_051012_0.pdf.

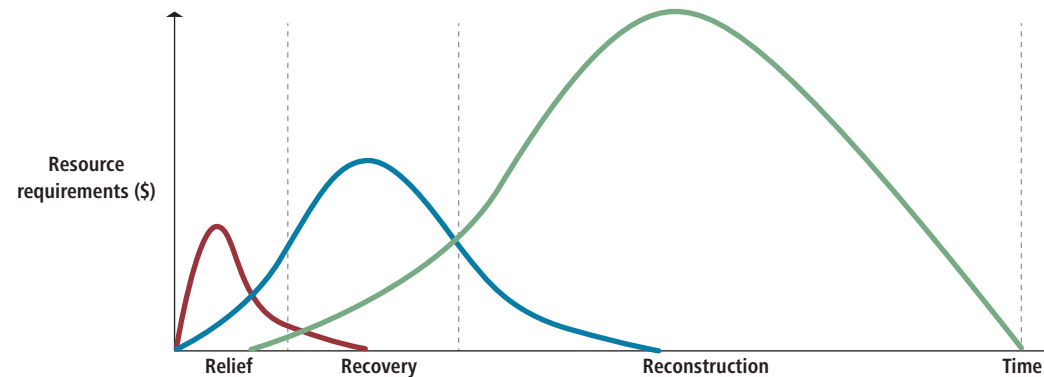
Figure 3: Most Cost-Effective Financial Instruments for Different Types of Risk



Source: World Bank.⁸

A temporal dimension is the second key factor to be taken into account in forming a cost-effective DRF strategy. Indeed, a government might not use all of the funds needed for recovery in the days following a disaster (Figure 4). Immediate resources are necessary to carry out emergency operations. Ensuring that these resources are available and that operations can be carried out quickly is crucial to stabilize the human, social, or even economic impact of a disaster. However, it is only after a few months, sometimes even a few years, that the financial needs will be maximized to address reconstruction works.

Figure 4: Temporal Dimension of Post-Disaster Finance Needs



Source: World Bank.⁹

The third factor concerns the legal and administrative aspects. Funds and financing mechanisms must be put in place and payments must be made at the required times. This step is vital for the financial strategy to effectively meet the GoJ's needs. In many cases, efforts to secure funds quickly after a disaster are hampered by the multiple administrative steps required for the responsible institution to appropriate resources and execute operations. In other cases, oversight of the use of public resources is suspended and the lack of transparency often results in losses when resources are already low. Similarly, some governments take out parametric insurance before realizing after a disaster that the payments would be treated as non-tax revenues and would therefore be transferred to the treasury, thus generating delays in the execution of emergency and recovery operations. Although often overlooked, this legal and administrative dimension needs to be addressed with particular attention so that the risk financing strategy is effective.

To address these three key factors, the analysis captured in this report employs a country-specific operational framework informed by the experience of the World Bank in similar countries.¹⁰ To specifically address the needs of the GoJ related to natural disasters, this approach focuses on three activities: quantifying the contingent liabilities of the GoJ to estimate the fiscal risk of natural disasters, reviewing the current public financial management of natural disasters in Jamaica and the legal environment for addressing shocks on public finances, and evaluating the domestic non-life insurance industry for its capacity to build a strong financial sector for public and private risk transfer.

⁸ Ghesquiere, F. and Mahul O. 2010. Financial Protection of the State against Natural Disasters: A Primer. Washington, DC: World Bank.

⁹ Ibid.

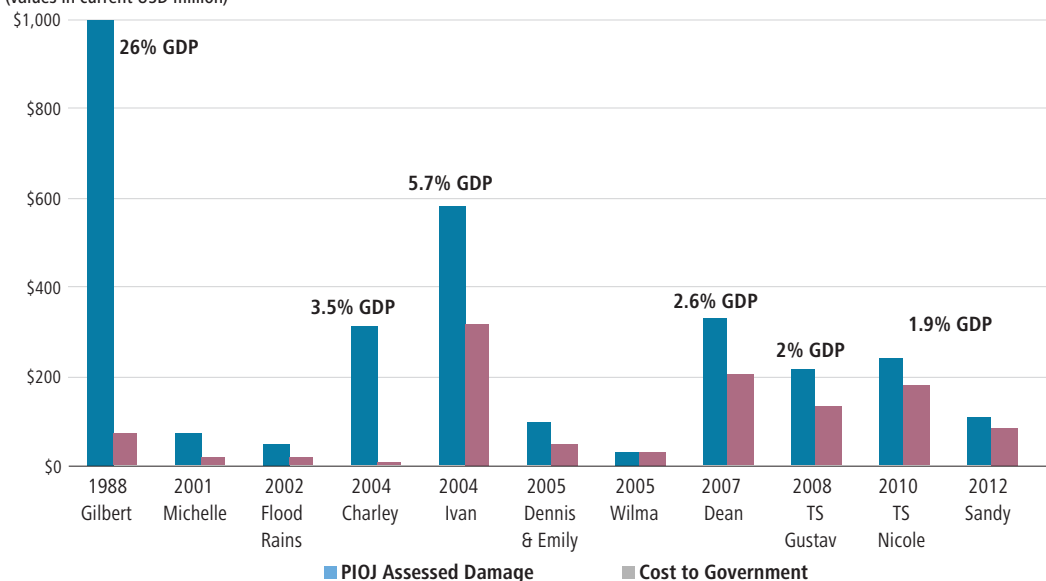
¹⁰ Financial Protection against Natural Disasters: From Products to Comprehensive Strategies, An Operational Framework for Disaster Risk Financing and Insurance. 2014.

Brief Introduction on the Case for a DRF Strategy in Jamaica

Jamaica is highly exposed to natural disasters of varying intensity and severity. Several types of disasters—hurricanes, tropical storms, earthquakes, droughts, floods, and landslides—occur frequently. Between 1988 and 2012, 11 named storms made landfall in Jamaica, causing significant physical and financial damages (Figure 5). In addition, some years have seen intense rainfall that has caused flooding. The Intergovernmental Panel on Climate Change (IPCC) has high confidence that the effects of climate change will intensify.¹¹ Impacts from natural disasters will therefore likely become greater, commensurate with growth in Jamaica's population and economy. As a result, the country can expect extreme weather events to become more frequent and more intense and result in greater financial losses. On the revenue side, smaller economies like Jamaica's often have lower-than-expected revenue generation, partly due to tax policies that might not be optimal for small economies. However, there also seems to be a regional factor at play, as Latin America and Caribbean (LAC) countries in general exhibit low government revenue generation. These revenue factors, combined with the increased cost of natural disasters, result in high levels of public debt in LAC small economies.¹²

Figure 5: Damage and Losses from Major Natural Disasters in Jamaica

(values in current USD million)¹³



Source: Authors, based on Planning Institute of Jamaica (PIOJ).

Natural disasters are one of the main risks to Jamaica's macro-economic outlook.¹⁴ After Hurricanes Dean and Gustav, Jamaica's inflation growth rate peaked at more than 20 percent (Figure 6), gradually declined, and then again rose to 13 percent in 2010 after Tropical Storm Nicole. These rates have closely mirrored the rate of change of the debt-to-GDP ratio over the past 15 years.¹⁵

Economic growth is projected to increase over the next several years, assisted by the International Monetary Fund (IMF) Extended Fund Facility. Mining, construction, and tourism are the industries expected to contribute significantly to this spike in economic performance.¹⁶ Jamaica's infrastructure and tourism sectors have historically accounted for 73 percent of damage and loss from natural disasters since 2000.¹⁷ Reallocating funds to repair public infrastructure assets strains Jamaica's limited fiscal space, and seeking ad hoc external post-disaster reconstruction financing increases public debt. Bilateral and multilateral aid flows, at only USD 80 million (J\$ 10 billion) since 1990 have also not sufficient to finance recovery and reconstruction efforts.¹⁸ Additionally, donor assistance in the form of budget support to Jamaica

¹¹ IPCC. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [R.K. Pachauri and L.A. Meyer (eds.)]. Geneva: IPCC.

¹² Lederman, Daniel and Lesniak, Justin T. 2017. Open and Nimble: Finding Stable Growth in Small Economies, Summary. Washington, DC: World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/26304> License: CC BY 3.0 IGO.

¹³ Criteria for major natural disaster: 10 or more people dead, 100 or more people affected, declaration of a state of emergency, and call for international assistance.

¹⁴ 2014 Article IV Consultation Fourth Review Under the Extended Fund Facility and Request for Modification of Performance Criteria, June 2014.

¹⁵ Montecino, Juan and Johnson, Jake. 2012. "Update on the Jamaican Economy," CEPR Reports and Issue Briefs 2012-15.

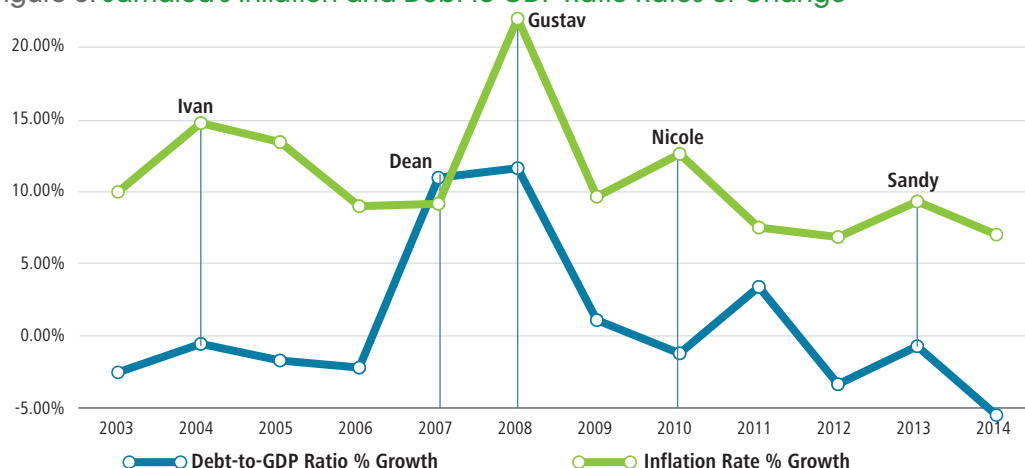
¹⁶ Construction is centered around residential housing projects and hotel expansions (Market Dynamics Caribbean, Issue #7) and government facilities and road infrastructure (Market Dynamics Caribbean, Issue #10).

¹⁷ Planning Institute of Jamaica (PIOJ). 2012. PPCR Socio-Economic and Environmental Disaster Impact Assessment Handbook for Jamaica.

¹⁸ AidData Beta. 2015. Open Data for International Development.

is unpredictable and has not been properly accounted for in planning the financing of medium- to long-term recovery and reconstruction needs. The 2014 Public Expenditure and Financial Accountability (PEFA) report assessed the predictability of Jamaica's direct budget support with a "D+," which can be partially attributed to another "D+" score for Jamaica's lack of inclusion of details of donor funding and donor-funded expenditures in the budget and within financial reports. Inclusion of data regarding extra-budgetary operations in the budget and financial reports is necessary to provide a complete picture of central government operations and to show the full impact of a disaster on fiscal outcomes.

Figure 6: Jamaica's Inflation and Debt-to-GDP Ratio Rates of Change



Source: International Monetary Fund (IMF) World Economic Outlook Database.

The quantification of fiscal risks linked to natural disasters is the first step in devising a cost-effective DRF strategy. Jamaica's Country Disaster Risk Profile (CDRP) developed by the World Bank presents country- and department-level earthquake and hurricane risk profiles by estimating the potential economic losses to public and private building infrastructure.¹⁹ According to the CDRP, hurricanes cause an average annual loss (AAL) of USD 67 million (J\$ 9 billion) and annually earthquakes cause USD 36 million (J\$ 5 billion) in losses, 0.5 percent and 0.3 percent of the GDP, respectively. Moreover, there is a 0.4 percent chance each year of losses exceeding USD 3.5 billion (J\$ 450.8 billion) due to hurricanes and USD 2 billion (J\$ 258 billion) due to earthquakes. Single-family, wood-frame walls with plywood sheathing, as well as reinforced masonry buildings with concrete diaphragms, are the most vulnerable to hurricanes, each type accounting for 23 percent of AAL.

The PEFA report further validated these estimates and took the first steps in quantifying the GoJ's explicit contingent liabilities using data from historical events.²⁰ A portion of implicit liabilities is included in the quantification, given available data. This exercise considered 26 natural disasters between 1993 and 2013, including events that were less severe than the major disasters referenced above. Total losses and damages for all events considered was USD 2.22 billion (J\$ 285.91 billion) and, on average, USD 121 million (J\$ 16 billion) per annum.

This report contains the main findings and recommendations of this technical assistance, including how to use risk assessments like AAL in a fiscal protection strategy. This report contains five chapters. After this introductory chapter, Chapter 2 presents an overview of the budgetary framework for disaster response and the legislation and policies that support it, before evaluating its effectiveness and cost-efficiency. Chapter 3 provides a preliminary financial disaster risk assessment for Jamaica, focusing particularly on the fiscal impact of natural disasters. Chapter 4 presents an overview of the private catastrophe insurance market, and Chapter 5 presents recommendations for future financing of natural disaster recovery and reconstruction expenditures. The report is complemented by technical annexes that provide information on further analyses and results.

¹⁹ For the purposes of this report, the "quantification of fiscal risks" has been applied through several methodologies, each focusing on explicit and implicit contingent liabilities. However, it must be noted that implicit contingent liabilities are inherently difficult to distinguish and solely quantify. The CDRP is a methodology (explained in Chapter 3) that quantifies a portion of direct economic loss of the building stock, then further extrapolates from this amount which costs are borne by the GoJ, or rather, the GoJ's contingent liabilities in building stock. The actuarial analysis of historical disasters in Jamaica, also discussed in Chapter 3, models the public sector-specific losses from future events by using country knowledge of public investments in each productive, transportation, and social sector affected by the disaster. These estimates capture primarily the GoJ's direct contingent liabilities, and also capture a portion of the GoJ's implicit contingent liability by, for example, applying the knowledge that historically the GoJ has made ad hoc financial responses to the housing sector.

²⁰ A consultant with the DRFTA Project worked with the MoFPS and the ODPFM for data collection in August–September 2015.

Chapter 2

Chapter 2. Public Financial Management of Disaster Risk

The Legal and Regulatory Framework

The Jamaican Constitution and the Financial Administration and Audit Act²¹ (FAA) provide the primary legal and institutional framework for fiscal operations, enumerate the basic principles for the operation of the Consolidated Fund and the Contingencies Fund, and prescribe definitions and parameters for operating in times of emergency.²² At the national level, Jamaica's disaster management and response programming is managed by the National Disaster Committee (NDC) and its six subcommittees. The NDC is the senior Jamaican disaster planning body. The ODPEM is the main body within the NDC responsible for coordinating the management and response to disasters, as well as for disaster risk reduction (DRR). The Prime Minister is the Chairman of the NDC.

The Financial Administration and Audit Act

Amid tight fiscal regulations and debt management guidelines designed to improve Jamaica's macro-economic outlook and debt-to-GDP ratio, the FAA provides an "escape clause" from these rules. The FAA stipulates that the fiscal rules can be suspended for a maximum of 2 years if there is an event, such as a natural disaster, that results in fiscal impact of 1.5 percent of the GDP or higher (see sections 48C(2)(a) and 48C(3)(a)).²³ The rules are mindful that the GoJ may subscribe to insurance facilities, and only the difference between the total value of the disaster and the insurance payout should be counted.

The FAA also takes steps to define contingent liabilities of the GoJ broadly as ²⁴:

- a A possible obligation that arises from past events and whose existence will have to be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity;
- b An existing obligation that arises from past events but is not recognized...

However, the FAA does not differentiate between an implicit and an explicit liability. The Task Force on Finance and Statistics (TFFS) defines explicit contingent liabilities as legal or contractual financial arrangements that give rise to conditional requirements to make payments of economic value.²⁵ Payments are effected when one or more conditions is satisfied or occurs. Implicit contingent liabilities represent moral obligations or burdens that, although not legally binding, are likely to be borne by governments because of public expectations or political pressures.²⁶ These two definitions could assist policy makers in quantifying contingent liabilities of the GoJ to gauge ex ante financing needs.

The FAA includes a post-disaster provision for faster disbursement from the Contingencies Fund, established by the Constitution, and administered by the Accountant General. The Fund operates as a perennial fund with the balance rolling from one financial year to the next. The balance as of January 2018 was USD 727,000 (J\$ 94 million). The Minister of Finance and the Public Service may make advances from the fund if there is an unforeseen need for expenditure; however, no payout has been made for disaster-related expenditure in the last 10 years. The FAA also calls for a fiscal policy paper to be released with each budget that includes contingent liabilities, any commitments not included in the fiscal forecasts, and all

21 Financial Administration and Audit Act, 1959, revised 2012. Available at: http://moj.gov.jm/sites/default/files/laws/The%20Financial%20Administration%20and%20Audit%20Act_0.pdf.

22 The World Bank acknowledges that this report is not a full legal review, which was beyond the scope of the technical assistance. This report does, however, address the most pertinent aspects of the Constitution, Acts, and Plans that relate to DRF, with a focus on assessing those that were cited by the GoJ as the legal backing for its actions in times of disaster related to finance.

23 This quantitative floor was arrived at using a methodology described in Damage and Loss Assessment (DaLA) reports from the United Nations Economic Commission on Latin America and the Caribbean (ECLAC) on the major events between 2004 and 2012.

24 See section 48A of the FAA.

25 This was an alternate definition of the explicit contingent liabilities that the GoJ considered when developing the fiscal rules.

26 See page 132 of the TFFS Act.

other circumstances that may have a material effect on the fiscal and economic forecasts. The 2014–15 fiscal policy paper notes that Jamaica’s enhanced fiscal rules require the government to allocate funds in the budget for weather-related events and then transfer those funds to the Contingencies Fund. The FY 2014/15 Budget made no explicit provision for weather-related events.²⁷

The Disaster Risk Management Act

The Disaster Risk Management Act, revised in early 2015, is the legislation that defines the GoJ’s capacity to identify, reduce, and manage disaster risk through a comprehensive set of guidelines and procedures targeting the national, parish, and community levels. The Disaster Risk Management Act is the legal backbone of the ODPEM, provides the definition of natural disasters, and identifies the responsibilities and functions of the ODPEM. The Disaster Risk Management Act also obliges the ODPEM to identify any emergency contingencies that are within or related to the area of responsibility of each public body, and to develop within that public body a plan for mitigating or responding to that emergency.

The Disaster Risk Management Act is also the legal provision for the NDF.²⁸ The NDF is intended for projects that mitigate, prevent, prepare for, respond to, and recover from emergencies and disasters, and that provide financial assistance to households for relief and recovery from a disaster. However, the fund is primarily used for the coordination of risk reduction activities. According to the NDF Terms of Reference (ToR), a Finance and Administration Subcommittee of the NDC administers the Fund. The ToR authorizes the Subcommittee to invest the funds in financial instruments/institutions approved by the MoFPS. The Chairman of the NDC has to authorize all payments and, unless there are unforeseen disaster expenses, the ODPEM is authorized to spend a maximum of USD 30,000 (J\$ 4 million) annually.

The NDF is currently capitalized at USD 2 million (J\$ 258 million), and has historically received an annual injection of USD 433,747 (J\$ 56 million). Some in the government agree that the NDF is not adequately capitalized or accessed as intended. The NDF falls short of the AALs and government expenditures tracked historically by the Planning Institute of Jamaica (PIOJ). Part IX of the Disaster Risk Management Act stipulates that, as of April 2015, 1 percent of the revenues from commercial and residential development paid to local authorities annually is to go to the Fund, along with parliamentary contributions, grants from approved organizations, and funds raised by the NDC. The NDC is to have a separate NDF Committee that shall be responsible for NDF administration.

The ODPEM’s Annual Report states that the ODPEM manages a number of disaster funds and had funds remaining related to: i) Tropical Storm Gustav, from the Organization of American States (OAS); ii) Hurricane Dean, from the U.S. Agency for International Development (USAID) and the United Nations Development Programme (UNDP); and iii) Tropical Storm Gustav, from USAID. There are, therefore, a number of other financing mechanisms other than the NDF. The NDF is designed to channel all funds for short-term disaster relief. However, this has not been the practice, and external partners have been able to channel funds outside of the Treasury Single Account (TSA).²⁹

Social Protection

The GoJ has also made several ad hoc social policy responses to natural disasters. After Hurricane Dean in 2007, for example, The GoJ’s relief assistance took the form of two benefits package amounting to USD 8.4 million (J\$ 1.1 billion).³⁰ More than 90,000 households registered under the Program for Advancement through Health and Education (PATH)³¹ and received cash grants of roughly USD 30 (J\$ 3,863), while about 75,000 National Insurance Scheme (NIS) pensioners and elderly received a one-time payment of about USD 72 (J\$ 9,273).

The Budgetary Framework for Post-Disaster Financing

Historically, the GoJ has chosen to reallocate resources within the domains of ministries to meet the more pressing costs of natural disaster response. This reallocation is accounted for outside of the regular budget cycle through mid-term Supplementary Estimates. Between 2004 and 2014, the national budget,

27 Government of Jamaica Fiscal Policy Paper 2014–2015.

28 “An ACT to Repeal the Disaster Preparedness and Emergency Management Act and to make new provisions for the management and mitigation of disaster, the reduction of risks associated with disaster and for connected matters.” Government of Jamaica, June 13, 2014.

29 “For over a number of years funds were donated from other countries to assist with response to disasters. Individual accounts were usually opened for these funds. The NDC took the decision that all balances should be transferred to one main account called the ‘National Disaster Fund.’ The fund was placed in the Bank of Jamaica and monitored by the [MoFP].... All donations received towards the fund will be deposited to the account and allocated subject to donor conditionalities.” – Terms of Reference for Operating of the NDF.

30 PIOJ. 2007. “Assessment of the Socio-Economic and Environmental Impact of Hurricane Dean on Jamaica.”

31 PATH is a program funded by the GoJ and the World Bank.

Box 1: Natural Disaster Definitions and Triggers in Jamaica

The Constitution – Section 20(2)(c) – a Proclamation by the Governor-General that a state of public emergency exists as a result of ... earthquake, hurricane, flood, fire, outbreak of pestilence, outbreak of infectious disease or other calamity. This period can remain in effect for 14 days and extended up to 3 months by resolution of a two-thirds majority of the members of both Houses of Parliament.

FAA – The fiscal rules prescribed in the FAA can be suspended in the occurrence of “a period of public disaster within the meaning of section 20 of the Constitution AND when the Auditor General has validated that the estimated financial impact of the event is greater than 1.5 percent GDP.”

Disaster Risk Management Act – The occurrence or threat of an event, whether caused by act of God or otherwise, which a) results or threatens to result in loss or damage to property, damage to environment, or death or injury to persons on a scale which requires emergency intervention by the state; and b) may result from fires, accident, acts of terrorism, hurricane, pollution, disease, earthquake, drought and flood, or the widespread dislocation of essential services.



PHOTO: USAID.GOV

through both the Estimates of Expenditure (EoE) and the Supplementaries, have accommodated approximately 22.6 percent of total disaster financing needs, or USD 895.5 million (J\$ 115.3 billion) in nominal terms. Supplementary Estimates have accommodated 43.2 percent of these post-disaster expenditures and the EOE have accommodated the rest.

The Supplementary Estimates for the period 2004–2014 show that, within the 3-month period immediately following a disaster, the gross Supplementary for disaster response financing has increased relative to non-disaster years, totaling USD 86 million (J\$ 11 billion) (Table 4). The bulk of the resources come from the Capital A budget. Spending by the Ministry of Transport, Works, and Housing accounts for 63 percent of supplementary financing, followed by the Ministry of Education at 7.1 percent (Figure 7).

Table 4: Post-Disaster Financing Reallocations in Supplementary (in J\$ thousands)

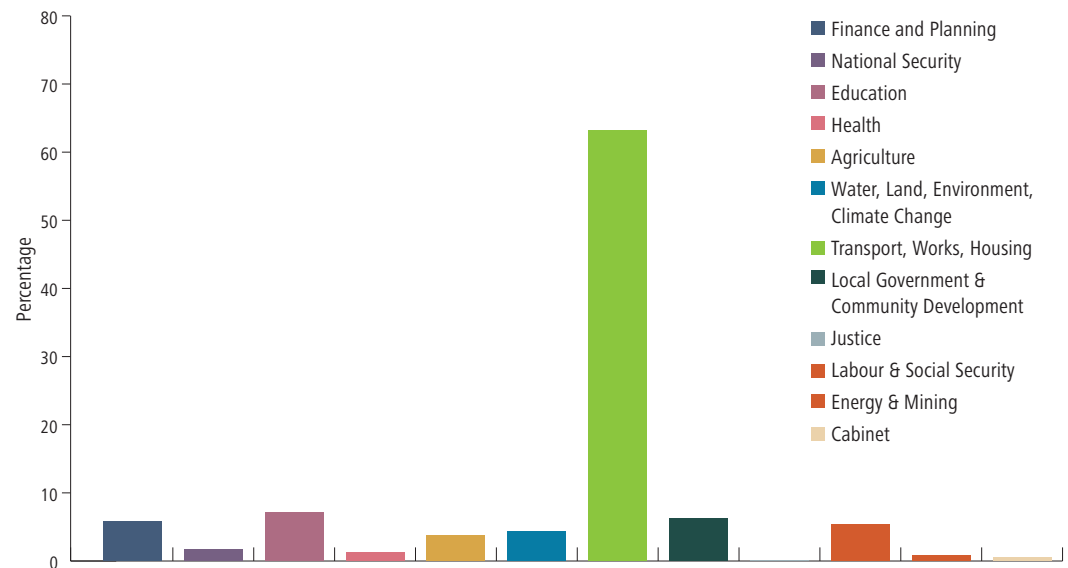
Fiscal Year	Net Supplementaries (Disaster Financing)	Recurrent	Capital A*	Capital B*
2004/05	\$1,282,434	\$329,380	\$306,054	\$647,000
2005/06	\$960,280	\$643,411	\$216,869	\$ 100,000
2006/07	\$245,135	245,135	–	–
2007/08	\$3,636,136	\$2,906	\$3,451,230	\$ 182,000
2008/09	\$2,407,240	–	\$2,407,240	–
2010/11	\$801,345	–	\$901,500	(\$ 100,155)
2011/12	\$40,000	–	\$40,000	–
2012/13	\$1,705,133	–	\$1,815,133	(\$ 110,000)
2014/15	\$95,000	\$95,000	–	–
Total	\$11,172,703	\$1,315,832	\$9,138,026	\$718,845
Percent of Total		11.8%	81.8%	6.4%

*Capital A is funded solely from revenues obtained from taxes. Capital B is funded by revenues from both taxes and multilateral and bilateral loans and grants.

Since fiscal year 2010/11, the GoJ has actively maintained net zero in expenditures on natural disasters by reallocating within available resources instead of adding to the approved estimates. For fiscal years 2004–2014, the GoJ’s immediate relief and recovery efforts were largely accounted for by reallocating funds. For example, in 2013, the Ministry of Health reallocated³² USD 2.1 million (J\$ 270.5 million) from three activities within its approved budget—purchase of vehicles, health facilities improvement, and purchase of medical equipment—to effect repairs to health facilities damaged by Hurricane Sandy.

32 A ministry cannot reallocate from another ministry’s resources (only intra-ministerial and where virements are not prohibited; there can be no virement from Object 21 – Compensation, as an example). Only the MoFP reallocates resources inter-ministerially. The activities for which the Ministry of Health reallocated or vired are all linked to the health portfolio.

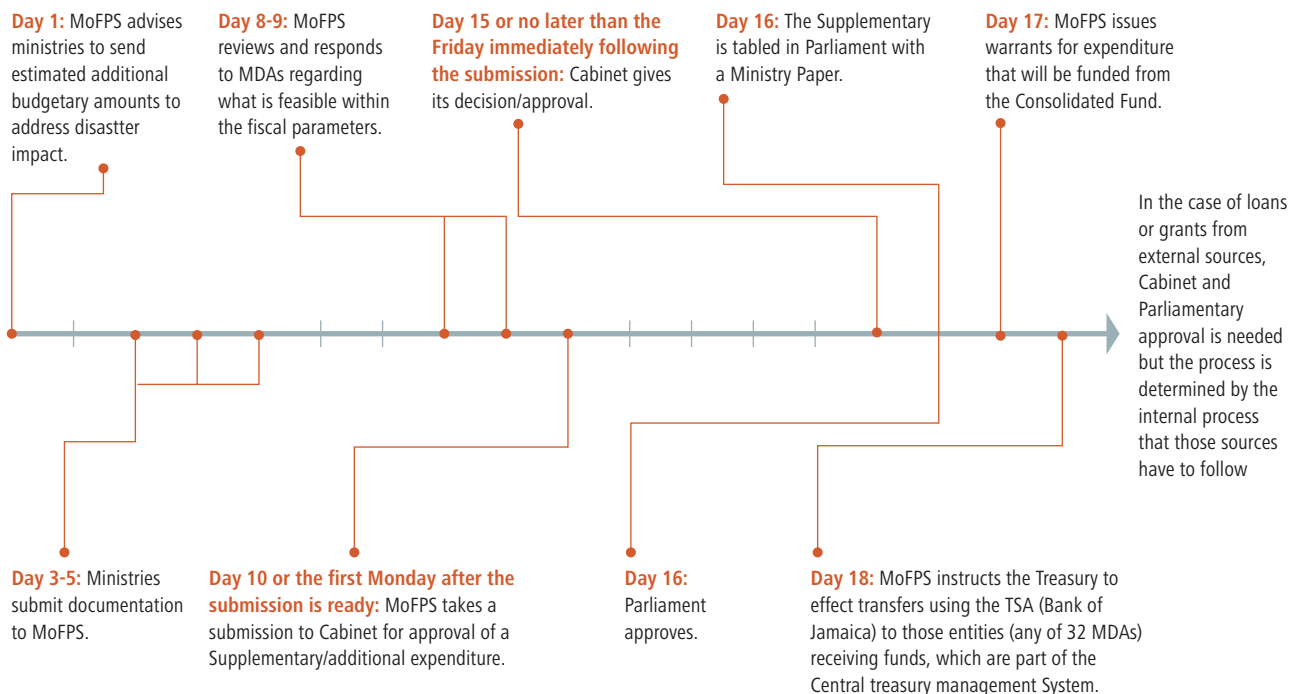
Figure 7: Supplementary Expenditure for Disaster Financing by Aggregate Ministry Allocation, FY 2004–2014



The Process to Regularize Post-Disaster Extra-Budgetary Expenditure

The process to approve unbudgeted expenditure begins with Day 1, in which the MoFP issues a “call” for the damage estimates related to the disaster event.

Figure 8: Illustration of Timeline and Process to Approve Additional Budgetary Allocations Post-Disaster



Currently, there is no method for quantifying and budgeting for the contingent liabilities realized after less-severe, frequent natural hazards. Instead, the Fiscal Responsibility Framework (FRF), specifically Regulations 4 and 7 of the FAA FRF Regulations and Section 16(3) of the FAA, provides the legal grounds for regularizing excess expenditure after it has gone to the Executive (Cabinet) for approval. The process is initiated by the MoFP, and ends with the MoFP issuing the warrants for distribution to the line ministries.

On average, only about 12.8 percent of relief expenditures allocated and 11.8 percent of reconstruction expenditures allocated³³ by the GoJ per event could be tracked in Economic and Social Survey Jamaica Report and EoE documents as actual expenditures³⁴ (Table 5). This discrepancy could be the result of an inability to retrieve funds as programmed through internal reallocation or external partners; the lack of capacity within the GoJ to spend funds as programmed; an overestimation of resources needed; or the majority of expenditures, especially those from external partners, not tracked in TSA. While Jamaica's 2014 PEFA assessment scored the general comprehensiveness and transparency of the budget with an "A," the practice of monitoring expenditure payments received a "C."

Table 5: Post-Disaster Allocations and Expenditure between 1993 and 2014

Losses, (USD m)	Public Losses,* % of Total Losses	Private Losses,* % of Total Losses	Relief Expenditures (USD m)		Reconstruction Expenditures (USD m)	
			Allocated	Spent	Allocated	Spent
2,220	49.9	50.1	319.3	41.08	696.96	82.39

* Public losses are estimates of losses from the following sectors: governance, transportation, health, education, water, and the environment.

** Private losses are estimates of losses from the following sectors: agriculture, housing, tourism, commerce, electricity, and telecommunications.

Source: Economic and Social Survey Jamaica and EoE documents between 1993 and 2013.

The Chart of Accounts

The Chart of Accounts (CoA) has provisions to track natural disaster-related expenditures, but they are not used uniformly across ministries and do not differentiate between type of disasters or timing of expenditure (e.g., risk reduction phase, emergency response phase, reconstruction phase). The main identifier of disaster financing in the budget has been the program designation,³⁵ Program 005, Disaster Management. Ministries often use another program code specific to their ministry, but analysis of the CoA since 2004 shows that instances of this are decreasing. However, designating "Disaster Management" as the Activity would be more encompassing, since Activity is common to both the recurrent and capital budgets. A Sub-Activity code could then name the specific disaster.

An Activity code for "Disaster Management" with the Sub-Activity referring to the actual disaster, for example, Hurricane Sandy or Hurricane Dean, could be a solution. If the expenditure is not in response to a specific disaster, but for general DRR, a Sub-Activity code "General" could be used. This Activity code would be used for all natural disasters, and would remedy the issues of drought currently accounted for under a separate program, Program 485, for Drought Mitigation, as opposed to as an activity under a program in the Ministry of Agriculture and Fisheries (MoAF).

³³ Relief expenditures are characterized as emergency response activities typically within 3 months of event. Reconstruction expenditures are attributed to activities that take place 3 months or more after an event.

³⁴ For example, the 2014/15 EoE might allocate USD 100 million for road rehabilitation as a preliminary estimate, then the 2015/16 EoE has a final expenditure listed at USD 11.8 million.

³⁵ It is understood that no changes were made to the program designations in the revised CoA as the Public Expenditure Division of the Ministry will be undertaking a major reform—Medium Term Results Based Budgeting—and this may have implications for program structure.

Chapter 3

Chapter 3. Fiscal Disaster Risk Assessment

If natural disasters destroy critical public infrastructure, severe bottlenecks can occur. In 2012, the GoJ embarked on a comprehensive economic program with the IMF aimed at raising both the real rate of the GDP and per capita income growth. Minimizing interruptions in public sector infrastructure is crucial to maintaining the positive momentum of this program. To maintain fiscal and macro-economic goals, minimize impacts on the GDP, and correct for the inevitable physical impacts that natural disasters will have on Jamaica, a shift in the disaster management paradigm toward more emphasis on ex ante risk management measures must occur. International aid and development funding agencies have the strong view that hazard and vulnerability reduction efforts, as well as financial planning, before a catastrophe pay excellent dividends in reducing economic impacts.³⁶

Preliminary analysis of the ODPEM's Damage Assessment and Situation Reports and PIOJ's Economic Commission for Latin America and the Caribbean (ECLAC) reports shows that, on average, between the years 2000 and 2014, about half of a natural disaster's losses can be attributed to economic sectors traditionally considered to fall within the public sector.³⁷ The GoJ has no legal responsibility³⁸ to provide for private recovery and reconstruction after a natural event. However, understanding which post-disaster relief and reconstruction responsibilities are historically the GoJ's by precedent, especially in sectors composed primarily of private assets, is paramount for quantifying post-disaster contingent liabilities. For example, Hurricane Dean caused significant damages and losses in the generally private sectors of agriculture and housing.³⁹ However, the GoJ still incurred costs to repair irrigation systems and spent more than USD 8 million (J\$ 1 billion) to help vulnerable families affected by the storm. Of the USD 35 million (J\$ 5 billion) in private insurance payouts made after Hurricane Dean, about 60 percent were in the commercial sector. The remaining USD 14 million (J\$ 2 billion) was for personal property, falling well below the recorded USD 88 million (J\$ 11 billion) in housing damages. EoE between 2007 and 2010 show that about USD 48 million (J\$ 6 billion) was coded as reconstruction expenditures, even when sustained damages totaling USD 329 million (J\$ 42 billion) were further compounded by Tropical Storm Gustav in 2009 (Figure 9).

Fiscal Disaster Risk Modeling

The CDRP, developed by the World Bank in 2016, presents country- and department-level probabilistic disaster risk profiles to provide risk assessments and estimates of potential damage to buildings caused by hurricanes⁴⁰ and earthquakes.⁴¹ Traditionally, sophisticated global building inventory exposure models for use in natural hazard risk assessments are held within the private sector, usually the reinsurance industry and catastrophe risk modeling agencies. However, these models, databases, and methods are proprietary and not freely or openly available to the public sector. They also concentrate on building stock and do not explicitly address the fiscal exposure of a government, which is important for the public sector to quantify its sovereign disaster risk.

A critical component of a CDRP is the development of a consistent and robust exposure model to complement existing hazard and vulnerability models. Exposure is an integral part of any risk assessment model, capturing the attributes of all exposed elements grouped by classes of vulnerability to different hazards, and analyzed in terms of value, location, and relative importance.

The CDRP captures the spatial and construction attributes of the total building stock in Jamaica, such as geographical location, urban/rural classification, type of occupancy, building materials (e.g., wood, concrete), and replacement value. The total modeled replacement value of the building stock in Jamaica

36 OAS and USAID-OAS Caribbean Disaster Mitigation Project. 1996. "Insurance, Reinsurance and Catastrophe Protection in the Caribbean." Working paper prepared in collaboration with the World Bank.

37 Public losses are estimates of losses from the following sectors: governance, transportation, health, education, water, and the environment.

38 Financial management laws and regulations are void of prescriptions of legal responsibility. The GoJ provides for the most vulnerable, but as a social good not as a means of supporting private recovery efforts. The National Housing Trust is a public body. Homeowners who have National Housing Trust mortgages in their private capacity pay peril insurance as part of their mortgages. The risk is pooled but the National Housing Trust itself has no legal responsibility other than what the mortgage agreement states.

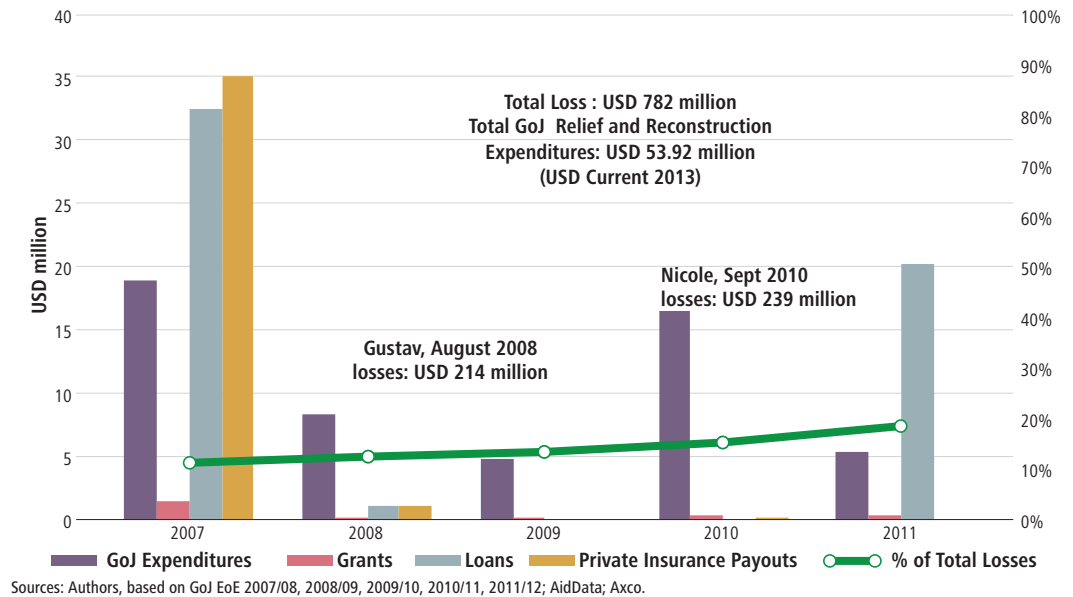
39 The GoJ has historically made risk transfer efforts in the agricultural sector, including several government-funded agricultural insurance schemes that have had limited success. These include the Banana Insurance Act of 1946, the Coconut Insurance Act of 1946, and the Coffee Industry Insurance Fund established in 1992.

40 The losses associated with hurricanes account for wind damage only, not damage from flooding or storm surge.

41 The development of the CDRP corresponds to increased impacts of natural hazards in recent years and increasing demand from the public sector for openly available disaster risk profiles. These profiles are intended to outline a holistic view of financial risk due to natural hazards, assisting governments in long-term planning and preparedness.

is USD 36.4 billion (J\$ 4.7 trillion) (2015 values). When the final combined asset replacement and infrastructure density are integrated with existing hazard and vulnerability models, the main result is three separate loss exceedance probability curves that represent the likelihood that a specific economic loss will be exceeded. This was done for both earthquakes and hurricanes using building exposure.

Figure 9: Financial Gap Analysis and Funding Source Breakdown of Hurricane Dean, Tropical Storm Gustav, and Tropical Storm Nicole



Because Jamaica has experienced substantial gaps between estimated loss and damage and actual expenditures—hindering economic and social development—quantifying the GoJ’s explicit contingent liabilities and incorporating them into budgetary planning is paramount. The fiscal disaster risk profile of Jamaica, reflecting the GoJ’s contingent liabilities associated with natural disasters, should be built on both historical recorded disaster losses and simulated, or probabilistic, losses. Probabilistic catastrophe risk models offer the GoJ innovative tools to assess its financial exposure to natural disasters. Such tools allow for the probabilistic assessment of low-frequency, high-severity disasters, such as major earthquakes or hurricanes, and their potential losses. Historical recorded disaster losses can be used to calibrate probabilistic models, in addition to providing loss statistics for high-frequency, low-severity events that have a draining impact on the budget.

Figure 10: Building Exposure Aggregated by Parish

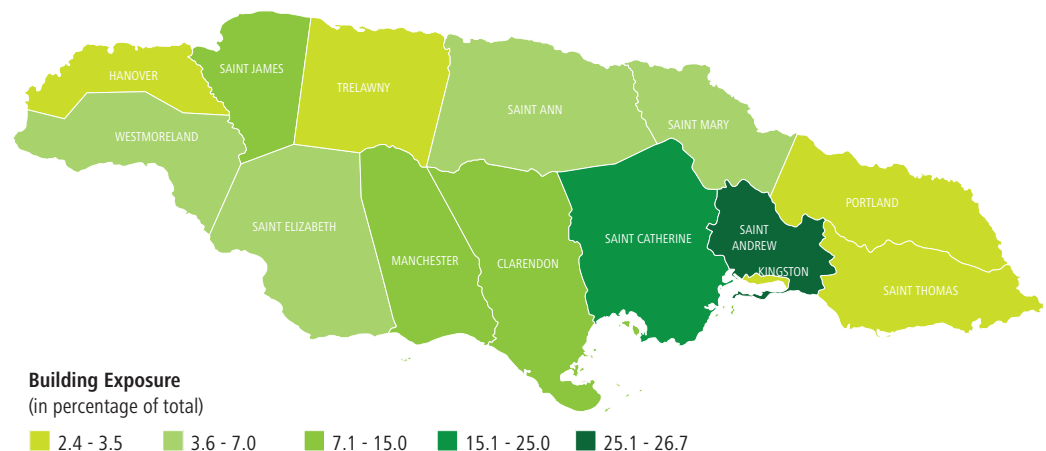
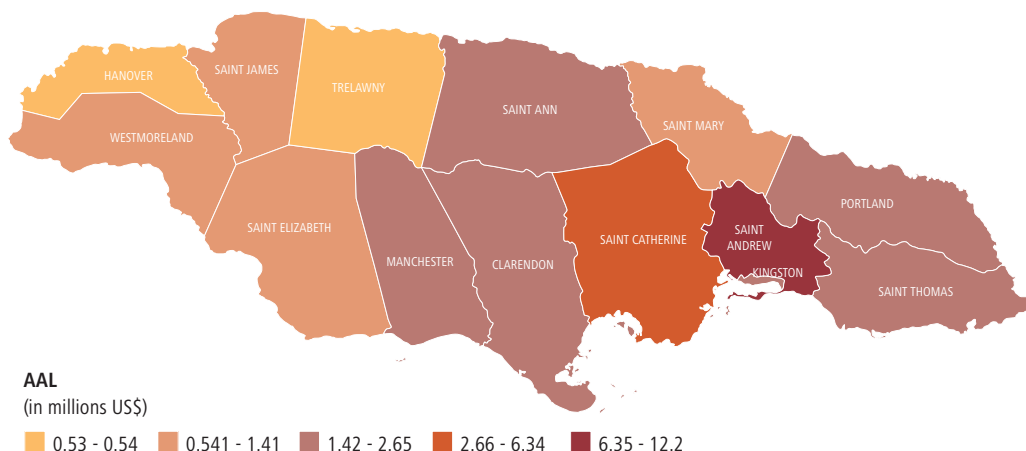


Figure 11: Disaggregation of the AAL due to Earthquake

(% of the total exposure value)



Combining the exposure model with hazard and vulnerability models indicates that national AAL to the building stock from earthquakes is USD 36.0 million (J\$ 4.6 billion), or 0.25 percent of the GDP. Additionally, every 250 years, these losses are expected to exceed USD 2.027 billion (J\$ 261.057 billion), i.e., 14.2 percent of the national GDP. The loss exceedance curve shows the potential earthquake losses for key return periods. Aggregated results at a parish level show that Saint Andrew parish accounts for 33.8 percent of the AAL. Moreover, multifamily, reinforced masonry bearing walls with concrete diaphragms are the buildings the most vulnerable to earthquakes: In the long term, 0.22 percent of the total value of this building type in Jamaica is affected by earthquake loss annually. (See Annex 2 for more detailed results.)

Regarding hurricanes, which are most prominent hazard in Jamaica, the national AAL to the building stock is approximately USD 67.3 million (J\$ 8.7 billion), or 0.47 percent of the GDP. Additionally, with a return period of 250 years, these losses are expected to exceed USD 3,468.4 million (J\$ 446.7 billion), or 24.3 percent of the GDP. Moreover single-family, wood stud-wall frame with plywood/gypsum board sheathing, as well as reinforced masonry bearing walls with concrete diaphragms, are the buildings incurring the largest losses in the long term, the two categories accounting for approximately 23 percent of AAL.

Figure 12: Disaggregation of the AAL due to Hurricanes

(in USD million) by Parish

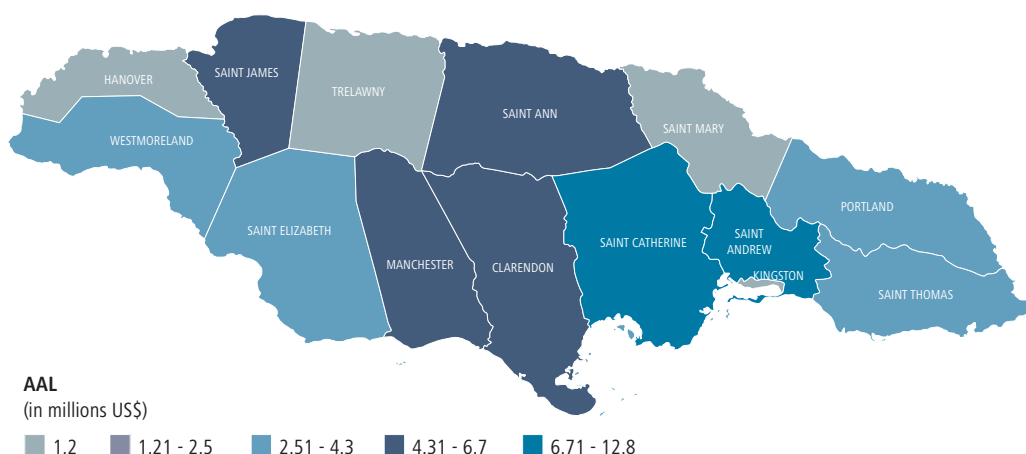


Figure 13: Exceedence Probability Curve for Losses in Building Stock due to Earthquake

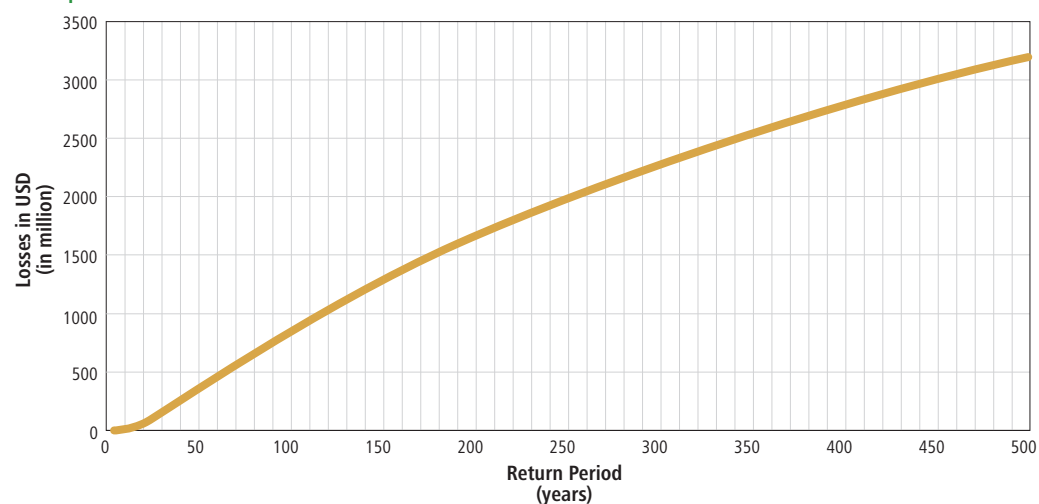


Figure 14: Exceedence Probability Curve for Losses in Building Stock due to Hurricane

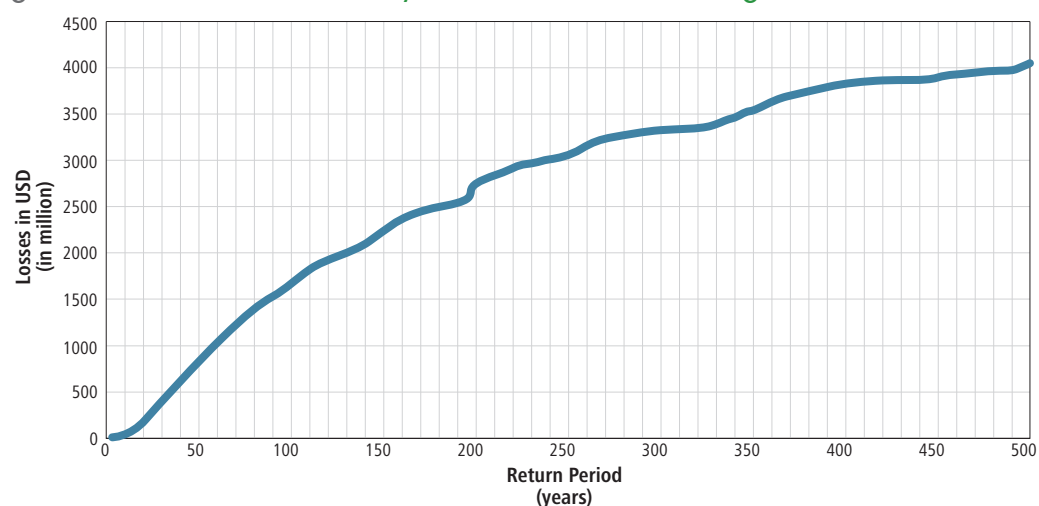


Table 6: Potential Earthquake and Hurricane Losses for Key Return Periods

Return Period (Years)	Earthquake Losses (USD million)	As % of Total Building Exposed Value	Hurricane Losses (USD million)	As % of Total Building Exposed Value
AAL	36.0	0.099%	67.3	0.472%
10	10.8	0.030%	27.0	0.189%
50	368.2	1.011%	952.8	6.681%
100	875.1	2.403%	1,869.7	13.109%
250	2,026.5	5.565%	3,468.4	24.319%
500	3,209.8	8.815%	4,545.8	31.873%

Analysis of Historical Disasters in Jamaica

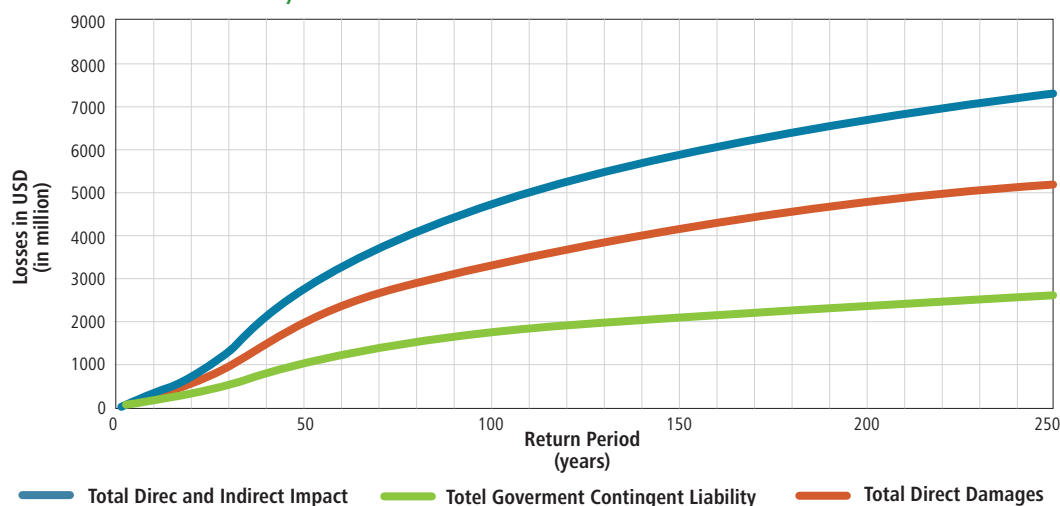
The probabilistic risk modeling approach is more comprehensive when combined with historical losses. This study compiled a historical database of natural disasters affecting Jamaica in the last two decades, from 1992 to 2016. Due to data availability, and since hydrometeorological events (floods, tropical storms, hurricanes, etc.) constitute the major risk in Jamaica, actuarial analysis on the historical losses was applied for hydrometeorological events only and did not include earthquakes. Analysis was performed theoretically and statistically to meet both objectives: to adjust the results of the estimated CDRP hurricane risk profile for recurrent losses, i.e., low return periods, and to extrapolate the risks on the building stock of the country to determine the public losses faced by the GoJ. (See Annex 3 for the methodology and key assumptions.)

The annual public fiscal disaster losses from hydrometeorological events are approximately USD 120.8 million (J\$ 15.6 billion), or 0.85 percent of the GDP. Once every 100 years, these losses are expected to exceed USD 1,729.3 million (J\$ 222.7 billion); in other words, there is 1 percent probability in any year that losses will exceed USD 1,729.3 million (J\$ 222.7 billion) from a particular event. Table 7 shows the indicative losses at key return periods for the estimated total economic losses, direct losses and public losses. Figure 15 focuses on the exceedance probability curve of the various loss estimations.

Table 7: Potential Hydrometeorological Event Losses at Key Return Periods

Return Period (Years)	Total Direct and Indirect Impact (USD million)	Total Direct Damages (USD million)	Total Government Contingent Liability (USD million)
AAL	300	223	121
10	317	238	131
50	2,785	1,973	1,057
100	4,734	3,347	1,729
250	7,304	5,155	3,276

Figure 15: Estimated National Floods and Hurricane Events Risk Profile, Indicative Exceedance Probability Curve



Source: Authors.

In summary, this fiscal disaster risk assessment provides the GoJ with an order-of-magnitude estimate of its possible public spending needs for post-disaster operations. Results of this assessment can be used as an input to a series of recommendations discussed in Chapter 5 that the GoJ may wish to consider as part of the development of a national DRF strategy.

CCRIF SPC products, as well as a contingent credit line, such as a World Bank Cat DDO, IDB Contingent Credit Facility for Natural Disaster Emergencies or the IMF RCF are financial instruments with a common

particularity: They provide fast disbursements of liquidities in the aftermath of a disaster. A CCRIF SPC trigger is parametric; assuming that the calculated index value is high enough to trigger a payout, the payout is to be made within 14 business days⁴² following the index calculation.⁴³ The trigger of a contingent line of credit can be soft: For example, Funds might become available for disbursement after the declaration of a state of emergency due to a natural disaster. To go further, a baseline to develop a DRF strategy when immediate liquidities are needed can be conducted by combining these two types of instruments, with contingent reserves alongside.

A dilemma commonly found in finance when optimizing portfolios is the tradeoff between minimizing the yearly average government spending under the terms of a given strategy and the uncertainty of that strategy. A mix of risk retention and risk transfer instruments is recommended to devise an optimal multi-year DRF strategy, the optimality depending on the risk aversion of the decision makers. Indeed, ex ante risk-retention instruments have a higher global impact on reducing the average overall cost and ex ante risk-transfer instruments have a higher global impact on the uncertainty or variance of this cost. In addition, there is a need to define longer-term objectives for sovereign instruments, such as capitalized reserves in a fund, and to strategize the multi-year uses of others instruments to integrate these aspirations to efficiently devise such a tailored strategy in the long run. For more details, see collaboration. worldbank.org/groups/cdrp.

External Aid Flows and Expenditures

Post-disaster funds from international development partners are typically the last type of funds to arrive and materialize as part of the EoE. Fund disbursement time is dependent on whether the resources are grant or loan funding, as loans take longer to process. The majority of these forms of assistance were captured under Program 005 (Disaster Management), Sub-Program 09 (Flood Damage) (see Annex 4).

A review of post-disaster response projects funded from external development partners shows that timelines are more often exceeded than met. Of the eight selected projects, three ended within the expected timeline. The original average duration of the eight projects was 19 months. However, the revised average duration was 38 months, twice the time originally envisaged.

Most of the external development partners use special bank accounts opened for the purposes of making project-related disbursements, instead of using country systems. As the central treasury management system reform deepens, international development partners will likely feel more comfortable using the TSA. The 2012 PEFA report pointed out an insufficient use of country systems and an overdependence on commercial banks. Currently, the Accountant General uses the Treasury General Ledger (TGL) to effect the various accounting records and reconciliations for the 32 ministries that use the central treasury management system. The TGL will soon have sub-ledgers that should be compatible with the fiduciary systems of international development partners, hopefully prompting increased use of country systems.

After past disasters, the GoJ also utilized reimbursement clauses for expenditures captured under loan agreements. Reimbursement clauses within loan contracts between the GoJ and its lenders can expedite access to development resources for the recovery phase. The Inter-American Development Bank did this in 2008, by reimbursing the GoJ USD 10 million (J\$ 1 billion) for resources spent on the 2007 Atlantic hurricane season in the 2008/09 fiscal budget.

In summary, the GoJ has benefited from the responsiveness of international development partners after natural disasters, but the delays in fund disbursements have led to reconstruction delays and circumnavigating country systems. There is need for stakeholders to devise more-efficient methods to ensure that disaster relief, recovery, and reconstruction assistance filters through country systems to the affected populations in the shortest time possible.

Remittance Flows

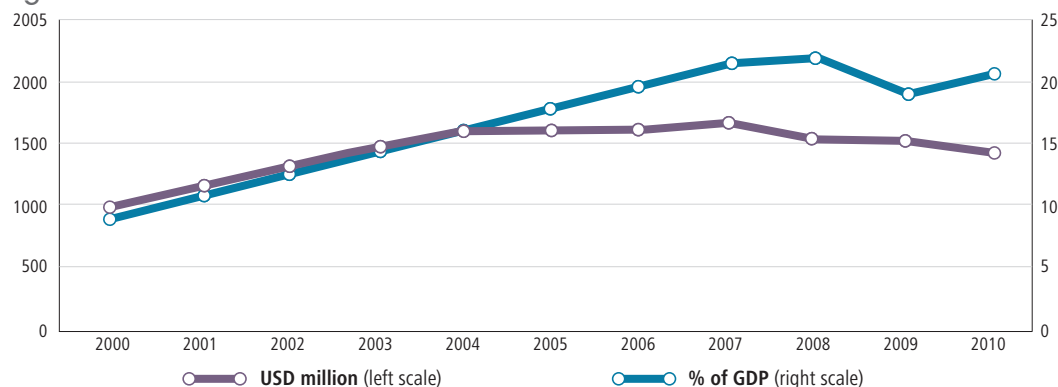
Jamaica maintains a large diaspora with a high volume of remittances. Remittances have historically increased during times of disaster, for example, during Hurricane Ivan in 2004.⁴⁴ If the GoJ can successfully harness remittance flows during times of disaster, by convincing the diaspora to redirect or increase remittance payments into public assistance.

⁴² Business days are defined as days on which banks in the Cayman Islands are open for regular business.

⁴³ More specifically, CCRIF SPC has the discretion to delay payment to not more than 90 days following receipt of the insured's claim.

⁴⁴ Ketkar, Suhas and Ratha, Dilip, 2010. "Diaspora Bonds: Tapping the Diaspora During Difficult Times." *Journal of International Commerce, Economics and Policy*. Vol. 1, No. 2: 251–263

Figure 16: Remittance Flows in Jamaica



Diaspora bonds represent a potential external instrument for borrowing. These bonds provide an alternative to costly foreign borrowing. The success of using such bonds relies heavily on the “patriotic discount” based on variables of trust in governance and the patriotism of the diaspora.⁴⁵ Israel, since 1951, and India, since 1991, have been in the forefront of raising hard-currency financing from their respective diaspora. Israeli bonds have been sold globally, with sales approaching USD 40 billion (J\$ 5 trillion). On the other hand, India used issuances of diaspora bonds in periods of financial turmoil by, in 1991, offering “India Development Bonds” during a balance of payments crisis and, in 1998, offering “Resurgent India Bonds.”

45 Akkoyunlu, Sule and Stern, Maximilian. 2012. “Empirical Analysis of Diaspora Bonds.” Research Paper 3. Geneva: The Graduate Institute of Geneva.

Chapter 4

Chapter 4. Review of the Catastrophe Insurance Market in Jamaica⁴⁶

Catastrophe insurance is an efficient ex ante risk financing instrument through which to transfer part of a country's financial risk. In the case of Jamaica, exposure and livelihoods are largely located in Kingston, which, situated on the Liguanea plain on the southeastern coast of the island, is generally flat and highly prone to hydrometeorological hazards. This chapter presents an overview of the current insurance and reinsurance market in Jamaica, with a focus on private and public catastrophe insurance, providing insights on its capacity to play a key role in Jamaica's DRF strategy. Specifically:

- a Low non-life insurance penetration rates in Jamaica mean that the private sector is underinsured. This increases the indirect contingent liability of the GoJ because the GoJ is often perceived as the insurer of last resort.
- b The GoJ can more cost effectively mitigate natural disaster risk by insurance of public assets and consolidating coverage into larger policies that reduce rates.
- c Current soft market conditions (as of September 2017) mean that premiums are lower, coverage is broader, and underwriting is easier.

Market Overview

According to the Financial Services Commission (FSC), Jamaica's macro-economic situation has not affected the domestic insurance industry.⁴⁷ Notwithstanding difficult economic times, the insurance industry's gross premiums had growth rates of 6–19 percent between 2010 and 2014.⁴⁸ Jamaica has the fifth largest insurance market in the Caribbean, after Puerto Rico, the Dominican Republic, the Bahamas, and Cuba. Jamaica's life and non-life insurance penetration stands at around 5 percent of the GDP, but the non-life insurance penetration lags regionally at only 2.25 percent of the GDP—only slightly above Trinidad and Tobago and Haiti and below Grenada and Saint Lucia at 3.93 percent and 3.16 percent, respectively.⁴⁹

As such, average annual life insurance premium growth has averaged 12.4 percent, while average annual growth in non-life premiums was only 7.4 percent between 2010 and 2014 (Annex 7). Further, the property insurance market has not experienced the same growth as the non-life insurance market as a whole. In 2014, the total non-life insurance premium income of the domestic market accounted for USD 312 million (J\$ 40 billion) and property insurance was 46 percent of the total non-life insurance market.⁵⁰ The non-life insurance market's combined ratio, or the total incurred losses divided by premiums, has decreased from 125 percent in 2009 to 100 percent in 2013. Based on these ratios, for the industry to be solvent, it relies on investment income to support itself. Industry interviews show that claim ratios have improved as products have been repriced, but improvement is limited.⁵¹ Recovery from Hurricane Gilbert in 1988 was relatively rapid, as many homeowners had insurance. However, premiums have since quadrupled and have not returned to prior levels. Homeowner's insurance is thus viewed as unaffordable.⁵² It is a requirement of mortgage companies, but once the mortgage is paid off, properties go largely uninsured. Homeowners have invested in improving physical structures, but industry and client interviews suggest that the market has become stagnant and needs new products.⁵³

Reinsurance rates are currently relatively low in Jamaica due to the lack of loss and damage from natural disasters over the past few years. If the rates become too low, the profit margin of reinsurance companies can drop, and they have incentive to pull away from business in Jamaica. According to the FSC,⁵⁴ most Jamaican insurance companies have confidence in the reinsurance market. Jamaican companies operate under strict regulations from the FSC, and the auditable financial statements of the 10 general insurance companies in Jamaica are examined by the FSC every 2 years.⁵⁵

⁴⁶ This high-level industry review was intended to inform recommendations to the Government of Jamaica and lay the groundwork for future public/private collaboration. An in-depth analysis of private sector catastrophe risk insurance was beyond the scope of and the focus of the study, though the report addresses sovereign catastrophe risk insurance through the CCRIF SPC in detail.

⁴⁷ June 18, 2015 meeting with FSC and World Bank.

⁴⁸ Inter-American Development Bank and Access to Insurance Initiative. 2014. "Improving access to insurance for the low-income population in Jamaica."

⁴⁹ Ibid.

⁵⁰ Axco Global Statistics/Industry Associations and Regulatory Bodies.

⁵¹ "Improving access to insurance for the low-income population in Jamaica" IDB & Access to Insurance Initiative. August 2014.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Conversations with the FSC, May 2015.

⁵⁵ Ibid.

The GoJ has insured some public assets, however, some key infrastructure, e.g., bridges are not covered.⁵⁶ Every 3 years, the policies of currently insured public assets go to tender. The Insurance Association of Jamaica (IAJ) has estimated that half the public assets could come under a shared portfolio of management, or they could consider an alternative of creating a fund that would self-insure assets. However, the self-insured fund would have difficulty managing extensive losses to infrastructure.

The micro-insurance sector is slowly growing, and low-income individuals in Jamaica are eligible for insurance from wind and excess rain through the Livelihood Protection Policy (LPP). The LPP is a weather index-based insurance policy that was launched by the Grace Kennedy General Insurance Company (formerly the Jamaica International Insurance Company [JIIC]) in 2013, together with local credit unions and the People's Cooperative Bank. After JIIC pitched the LPP in the parish of St. Thomas, with the St. Thomas Credit Union as the designated distribution channel, in September 2013, the local insurer introduced the policy to the overall market in Jamaica. Targeted at all low-income individuals irrespective of occupation, the LPP provides timely cash payouts soon after a weather event. The product is available across the island through local distribution channels, including cooperative banks, credit unions, and farmer associations.⁵⁷ The average premium under the LPP ranged from USD 52.80 (J\$ 6,600) to USD 528 (J\$ 66,001), while coverage ranged from USD 400 (J\$ 51,516) to USD 4,000 (J\$ 515,160). The LPP relies on text messaging to connect with clients prior to and after a disaster. Once the trigger is reached, individuals are again contacted via text message regarding payout. However, the cost of LPP coverage is still out of reach for the most vulnerable people in Jamaica.⁵⁸

Insurance in Jamaica remains underdeveloped due to a lack of awareness and understanding of the different products and a lack of new products within the insurance market. Insurance penetration remains low where much of the population is poor and an estimated 20 percent live below the poverty line. Some insurance initiatives are being considered in the agriculture sector, and the FSC is also looking at the micro-insurance sector. Nevertheless, property and automobiles account for more than 90 percent of all non-life premiums, and the market is very much driven by results in these sectors. Furthermore, car insurance is almost the sole source of income for several insurers, given that the margins on property insurance are extremely slim due to high reinsurance costs and inadequate primary rates.

To evaluate the adequacy of Jamaica's non-life insurance coverage, the following analysis uses a process of adjustment (Table 8). The initial measures of non-life insurance penetration are adjusted by the expected losses resulting from natural catastrophes and the income level of the country. The insurance penetration shows the level of written non-life insurance premiums in each year compared to the GDP in the same year. It indicates that, based on the historical and probabilistic loss database used in Chapter 3, the Jamaica market is "moderately insured."⁵⁹ For countries like Norway, which face relatively low levels of expected loss while having high levels of GDP per capita, a Tier 2 classification may not be cause for concern. For countries like Jamaica, with relatively high levels of expected loss and historically large differences between insured and total losses, this classification is more of an issue. Given its higher risk status, one would expect Jamaica to aim to become better insured compared to other middle-income countries.

The non-life insurance market in Jamaica offers a range of conventional and non-conventional insurance products. Typically, non-life business insurance is short term, with 12-month contracts in place. The major classes of business insurance are fire and property, car, and liability. In 2015, these three classes made up more than 89 percent of the total premiums written for non-life business insurance. In 2015, fire and property (42 percent of the premiums) remained a key area of business for non-life insurers in terms of gross written premiums. Table 8 summarizes the mix of business insurance, written by gross premium, according to the key classes of business insurance in Jamaica.

Property premiums have contracted recently, along with automobile business, which is feeling the effects of increased competition and thus rate reductions, indicating a stagnant non-life insurance market. Over last 5 years, the growth rate in non-life insurance premiums has not been able to match the rate of inflation.

Pricing has also stagnated and even decreased, which would attest to the soft market conditions for property insurance in Jamaica. It is expected that this trend will continue, with slight rate decreases in the foreseeable future. As reinsurance costs have decreased, the reliance on facultative reinsurance has gone down, while traditional proportional reinsurance has increased. In addition, catastrophe excess

⁵⁶ Conversations with Insurance Association of Jamaica, May 2015.

⁵⁷ JIIC. 2013. "JIIC Introduces New Insurance Product to Protect Individuals Against Extreme Weather Events. Available at: http://www.climate-insurance.org/fileadmin/mcii/documents/20131008_LPP_launch_Jamaica_JIIC_Press_release_final.pdf. Munich Climate Insurance Initiative. Available at: <http://www.climate-insurance.org>. The project is implemented by the Munich Climate Insurance Initiative in partnership with the CCRIF, MicroEnsure, and Munich Re.

⁵⁸ At the time of publication, the FSC was making important developments in the regulation of the micro-insurance sector, which should have positive impacts on the availability and pricing of such products.

⁵⁹ Countries above the average placed in the Tier 1 (better insured) category, with benchmarked insurance coverage between 1.36 percent and 10 percent. Those below the average are placed in the Tier 2 (moderately insured) category, with benchmarked insurance coverage between 0.00 percent and 1.36 percent. Countries below 0.00 percent benchmarked insurance coverage are underinsured. This method of classification takes into account not only how well insured a country is above the minimum, but also how it compares to other countries.

of loss pricing is going down, and companies can purchase additional limits for the same premium and negotiate better terms at the same rates.

In 2015, life and non-life insurance penetration was only 5.2 percent, below that of the Pan-Caribbean region (5.8 percent). ⁶⁰ The non-life insurance penetration was 2.2 percent in 2015. ⁶¹ As previously stated, the low penetration rate could be attributed to low awareness of the benefits of the insurance. On the other hand, the low penetration coupled with Jamaica's growing economy suggests a potential opportunity for the insurance market. The Jamaican insurance market is moderately concentrated; the top five general insurers in the insurance market had a market share of 76.0 percent in 2015, increasing from 64.8 percent in 2011.

Table 8: Risk-Adjusted Insurance Adequacy for Jamaica, 2016

Non-life insurance penetration	2.20%
LESS expected annual loss (% of GDP)*	0.70%
Expected loss adjusted penetration	1.50%
LESS benchmark requirement (for upper middle income**)	1.60%
Benchmarked insurance coverage	(0.10%)
Insurance adequacy (% of GDP in USD millions)	(14,010)

Source: Lloyd's Global Underinsurance Report, CEBR Methodology, October 2012.

Table 9: Gross Premium Distribution by Line of Business in Non-Life Insurance (in percentage)

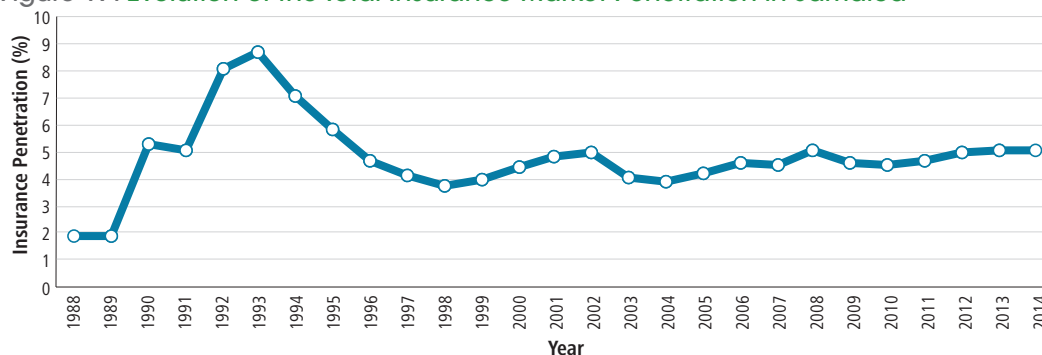
Type of Insurance	Year			
	2012	2013	2014	2015
Gross Written Premium (USD million)	322.7	282.3	297.6	311.5
Fire and Property	46.8%	49.8%	46.0%	42.2%
Automobile	46.8%	49.8%	46.0%	42.3%
Liability	4.1%	3.8%	4.5%	4.8%
Other	2.2%	3.3%	3.1%	10.7%

Source: Jamaica FSC Annual Report 2014–2015. IAJ annual statistics for 2015.

Table 10: Premium Breakdown for Property Business

Rates per unit of exposure	2014 (J\$ million)	2015 (J\$ million)	Year over Year Increase/(Decrease)
Total Sums Insured	2,947,134	4,650,403	57.8%
Policy Count	322,978	394,906	22.3%
Average sum insured per policy	79,568	97,831	22.9%
Annual premium per policy	921.34	877.78	(4.73%)
Rates per mille - commercial	—	6.90	—
Rates per mille - residential	—	11.15	—

Figure 17: Evolution of the Total Insurance Market Penetration in Jamaica



⁶⁰ AM Best Special Report: A Snapshot of the Caribbean Insurance market, September 3, 2015.

⁶¹ According to industry statistics, rating agencies, regulatory bodies, and Axco reports.

Chapter 5

Chapter 5.

Recommendations for a National Disaster Risk Financing Strategy in Jamaica

A comprehensive national DRF strategy for Jamaica should be designed to improve the capacity of the GoJ to access immediate financial resources in the event of a national disaster, be flexible to allow for a proportional response based on the magnitude of the loss, while minimizing reallocations from existing programs and maintaining the fiscal balance. Eleven recommendations for a comprehensive DRF strategy in Jamaica are presented in Table 10, followed by discussion of each of the recommendations. These recommendations follow the operational framework of first quantifying and assessing risk, or the contingent liability of the GoJ; preparing the environment for financial solutions to operate efficiently; and then arranging the solutions (Annex 1).

Strategy Recommendations

Table 11: Strategy Recommendations for DRF in Jamaica

Time Frame	Instrument and Strategy Recommendations for DRF
Sovereign Protection	
Short Term	1. Streamline and institutionalize a damage and loss data collection and reporting system across ministries for all severities of events.
	2. Streamline reporting of disaster relief, recovery, and response expenditures.
	a. Use the current Program for Disaster Management uniformly and consistently in the Revised Chart of Accounts to more accurately track post-disaster spending.
	b. Review Treasury General Ledger (TGL) to facilitate use of country systems by international development partners.
Short/Medium Term	3. Develop an inventory of public assets.
	a. Review the legal definition of contingent liabilities.
	b. Integrate explicit contingent liabilities in budgetary planning process based on potential losses to natural disasters.
	c. Apply rule for accounting of contingent liabilities based on International Public Sector Accounting Standard (IPSAS)*
Short Term	4. Codify or approve a DRF strategy.
	a. Prepare a manual for post-disaster financing to accurately capture the actors, the systems, the various sources of financing, and the process to disburse funds and budget execution.
	5. Increase contingency reserves through the NDF for public contingent liabilities associated with events with a 5-year return period -.
	a. Establish safeguards to ensure appropriate funds in the NDF and appropriate fund management.
	b. Conduct an audit of the NDF to ensure that all funds for short-term disaster financing have been transferred to the NDF.
	c. Establish or re-establish a mechanism for the rapid disbursement of financing of post-disaster expenses through Regulation 7 of the Financial Administration and Audit Act (FAA).
Medium Term	6. Engage external development partners in establishing a contingent line of credit, to finance public contingent liabilities associated with events of a 10-year return period.
	7. Establish a robust catastrophe risk insurance program for public assets and parastatals.
Long Term	8. Enhance management of implicit contingent liabilities related to social protection (SP).
	9. Explore diaspora bond and catastrophe bond markets.
Private Insurance Market	
Medium Term	10. Enhance availability, penetration, and affordability of private and residential catastrophe insurance, for example, through public-private partnerships (PPPs), and micro-insurance schemes, for example, through the Livelihood Protection Policy (LPP).
	11. Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for smallholder farmers.

* GoJ was slated to adopt IPSAS in 2007 based on 2007 Public Expenditure and Financial Accountability (PEFA) Final Report. This was the last public PEFA report and progress on IPSAS is unclear.

Recommendations

Sovereign Protection

1 Streamline and institutionalize a damage and loss data collection and reporting system across ministries for all severities of events.

Historical damage and loss data are crucial for accurate disaster risk analysis. Historical data are important components of disaster risk assessment and actuarial analysis, and thus play a significant role in the development of DRM strategies and financing instruments.

Jamaica has a relatively advanced system of collecting and reporting information related to the damage and losses sustained by different sectors for low-frequency, high-intensity events. However, information on damage and loss from high-frequency, low-intensity events is not reported in detail across ministries, especially when it comes to flooding, which is very acute in certain parishes. The MoFPS has noted that there is room to improve on capturing data associated with low-intensity, high-frequency events.

A new database in line with the standard damage and loss assessment (DaLA) methodology across ministries is recommended, along with guidelines on how and when to enter information. This would allow line agencies at national and subnational levels, as well as local authorities, to report damage and losses easily. It would also enable the MoFP and other line ministries to access critical information for recovery planning and appeal to donors. Although this initiative could be launched in the short term, it might take time to fully implement a comprehensive database. The World Bank recommends developing this database in consultation with the ODPEM to see how it can be improved and how it can capture information on high-frequency disasters. If this database can be linked to budgetary expenditures, it has the potential to be a powerful tool.

2 Streamline reporting of disaster relief, recovery, and response expenditures.

The Public Financial Management assessment raised a number of issues that require policy and/or legislative and regulatory actions to ensure that a DRF strategy can operate cost-effectively and -efficiently. Updated and accurate expenditure information is also important to the sustainability of the strategy to allow tracking of gaps and financing. The recommendations discussed below address specific issues identified in the budgetary analysis and through discussions with the GoJ.

a Use the current Program for Disaster Management uniformly consistently in the Revised Chart of Accounts to more accurately track post-disaster spending.

The Budget Preparation Management System, which is yet to be implemented, should be developed to allow the Fiscal Policy Management Unit (FPMU) to monitor fiscal risks to the budget, specifically the fiscal balance. These risks include, for example, using the Program 005 designation in the budget to track disaster-related expenditure from source to expenditure at the lowest level. Program 005 is currently split three ways: flood damage, which can capture all frequent, low-severity events; preparedness, which includes all DRR and the ODPEM. All large disasters are placed under the ODPEM with a sub-program referring to the name of the disaster.

Going forward, this program code must be used uniformly and consistently across the government to ensure that all post-disaster expenditures are coded and trackable. The EoE and the Supplementaries need to summarize disaster management and drought mitigation measures, as well as post-disaster spending on relief, recovery, and reconstruction. This can be done by conducting trainings on using the revised CoA to make the information more readily available and publicly searchable. A future review on its effectiveness and application can be conducted in the medium term.

b Review Treasury General Ledger (TGL) to facilitate use of country systems by international development partners.

In keeping with the central treasury management system reform, the Accountant General could create a sub-ledger within the TGL under the Contingencies Fund for disaster financing because it could be released only by a request from the MoFP. The turnaround time for disbursements is 24 hours, so this makes the mechanism efficient. However, this would require an opinion from the Attorney General's Chambers as to whether such a fund can be created within the ambits of the Constitution.

Review the status of the TGL with respect to capacity to facilitate use of country systems by international

development partners and steps to achieve the goals of international development partners using country systems.

Consultation should be initiated with the Public Financial Management Action Plan Technical Steering Committee, headed by Director General Dianne McIntosh and the Accountant General's Department, including its IMF-sponsored Technical Advisor, to ascertain where the improvement to the TGL is as far as enhancing TGL functionality to ensure that more/all international development partners use country systems.

3 Develop an inventory of public assets.

Insurance information for public assets is not standardized across government bodies and parastatals; an improved asset registry might be the answer to maximizing effectiveness of risk transfer instruments. Along with the uniform loss and damage reporting system (Recommendation 1), this system could be implemented through coordination with the ODPEM and other stakeholders but reside within the MoFPS. Both the inventory and the loss reporting system could inform efforts to prioritize the reconstruction of public works damaged by natural disasters. Rehabilitation and retrofitting existing currently uninhabited buildings could reduce government costs by decreasing rental payments, building resiliency in a pool of government assets, and increasing insurance coverage for public assets. An inventory of public assets is also the first step in accounting for the GoJ's contingent liabilities in budgetary planning.

A geo-referenced inventory of public assets at risk and their attributes (e.g., exact location, construction type, number of stories) is also a key component in building an exposure database, which is integrated with hazard and vulnerability models to establish a fiscal disaster risk profile.⁶² Generally, the more accurate the inventory is, the more accurate the fiscal risk assessment. Data to construct the inventory can be collected from various sources, such as government agencies, universities, research centers, international organizations, and statistics institutions. As the exposure database identifies what assets need to be protected, the unit within the MoFP responsible for purchasing insurance could be best suited to maintain the database. To better understand the collected information, the GoJ may choose to standardize and house the information on an open-source, web-based platform and make it accessible to all stakeholders.

a Review the legal definition of contingent liabilities.

Review the existing definition of contingent liabilities and, where appropriate, make amendments to ensure that it is relevant to the central government and not just public bodies engaging in public-private partnerships (PPPs).

The definitional issues relate to the absence of distinction in law between explicit and implicit contingent liabilities. This could be remedied by a schedule that specifies what are considered either implicit or explicit liabilities and the regulatory mechanisms to address both. Contingent liabilities are a fiscal policy imperative that has implications for debt management, expenditure management, and revenue performance. Since contingent liabilities are defined in both the FAA and the Public Bodies Management and Accountability Act, both acts, and the associated regulations, need to be amended to ensure coverage of both central government and public enterprise operations.

b Integrate explicit contingent liabilities in budgetary planning process based on potential losses to natural disasters.

A common weakness in budgetary preparation lies in quasi-fiscal expenditures, or contingent liabilities, not being taken into account. Examples of such quasi-fiscal expenditures include interest subsidies paid by the central bank on loans to public enterprises and special support operations for banks and public or private sector enterprises administered through the banking system. However, quasi-fiscal expenditures also include spending by nonfinancial public enterprises that represents the provision of public goods (e.g., schools or hospitals) or unplanned disaster response and reconstruction.⁶³

In general, it is difficult to estimate the cost of future disaster response and to consolidate such data in the general government tables. But to gain an overall assessment of the fiscal stance, it may be necessary to assess the size of such operations through an estimation of the government's physical assets and to notionally add the figures to the information on general government operations. In addition, those preparing the budget should take every opportunity to persuade policy makers to transform potential post-disaster social safety payouts, cash transfers, etc., to the extent that they can plan for such an expense, within the budget.

⁶² World Bank. 2013. "Quantify Contingent Liabilities Associated with Natural Disasters." GFDRR Short Note 1.

⁶³ Potter, Barry H. and Diamond, Jack. 1999. "Guidelines for Public Expenditure Management." IMF.

The GoJ should ensure that a careful record of all such explicit contingent liabilities is maintained, while recognizing that there will always be some uncertainty on the impacts of natural disasters, as well as moral pressures on implicit contingent liabilities, on ensuring that there are sufficient resources in the contingency reserve, and on potential payouts from sovereign catastrophe insurance or contingent financing mechanisms to meet such expenditures. Those preparing the budget should ensure that some estimate of expenditures from both explicit and implicit contingent liabilities is allowed for in budget preparation.

c Apply rule for accounting of contingent liabilities based on International Public Sector Accounting Standard (IPSAS).

Ensure that the appropriate accounting treatment is used for both contingent liabilities and any disaster-related fund to ensure budget transparency. The accounting treatment of both contingent liabilities and a disaster fund will need to be determined before implementation to inform the law. The GoJ was slated to adopt IPSAS in 2007 based on the 2007 PEFA Final Report; however, progress on this is unclear because no further PEFA reports have been made public. The Organization for Economic Cooperation and Development and the World Bank Disaster Risk Financing and Insurance Program (DRFIP) have also developed a methodology for assessing and accounting for contingent liabilities (to be published in 2017).

The MoFP agrees that it would need further guidance on moving toward accrual accounting. But in terms of definition of contingent liabilities, the MoFP needs to enhance the definition because it is skewed largely toward liabilities from public entities, but it does not capture risks associated with disasters on the private side.

4 Codify or approve a DRF strategy.

This study recommends the development of an ex ante plan for managing the fiscal impacts of natural disasters, considering the potential contribution of budget reallocations, debt financing, contingency reserves, insurance, and capital market instruments and taking into account financial capacity and desired risk retention and transfer levels, as well as the cost, timing, and availability of the various financing options.

The plan or appropriate portions of the plan should be publicly disclosed, where permissible, with the aim of building confidence in the government's capacity to manage the financial impacts of disasters.

a Prepare a manual for post-disaster financing to accurately capture the actors, the systems, the various sources of financing, and the process to disburse funds and budget execution.

The Public Expenditure Division should develop a post-disaster manual and government procedure for the GoJ, in collaboration with all the key agencies, including the ODPEM, with a view to shortening the time it takes to approve expenditure for disaster financing. This manual should ensure that the different systems and applications being used fully represent the budget preparation and execution process for disaster financing.

5 Increase contingency reserves through the NDF for public contingent liabilities associated with events with a 5-year return period.

The existing NDF, with a fast-disbursement mechanism, could be further capitalized and regulated as a vehicle for the rapid financing of public post-disaster reconstruction operations. This estimate is based on the estimated AAL for public contingent liabilities described in Chapter 3. These funds should be accessible for immediate post-disaster relief. The amounts in reserves can be achieved by investing smaller annual contributions into the existing fund, accumulating over the medium term. More importantly, an analysis of post-disaster budgetary processes shows that obtaining funding for post-disaster reconstruction activities is often done by reallocating already committed funding, thereby delaying or canceling planned maintenance or development activities.

a Establish safeguards to ensure appropriate funds in the NDF and appropriate fund management.

The current ToR for operating the NDF (Annex 5) were last updated in 1997 and should be revisited to ensure appropriate fund administration and management. As they do not currently include safeguards or instructions for fund capitalization, the ToR are a feasible starting point for improving and clarifying NDF management. Safeguards can prevent funds from being used for expenses other than disaster response. The GoJ can also present to donors and creditors a more welcoming environment for international assistance by showcasing a well-managed, transparent fund set aside specifically for disasters.

b Conduct an audit of the NDF to ensure that all funds for short-term disaster financing have been transferred to the NDF

Regulation 21 of the FAA (Financial Management Regulations) 2015, which outlines the restrictions to reallocations or virement, could be amended. A section (d) could be inserted as a part of Regulation 21(2), to restrict reallocation from disaster financing.

The Fiscal Rules, in the Third Schedule under B. Fiscal Management Strategy, at paragraph 4, reads: “In respect of the financial year to which the relevant Estimates of Revenue and Expenditure relate, provision of an amount for weather-related risks, which amount shall be transferred to the Contingencies Fund established by section 13 of the Act.” The law can be activated and amended so that funds can be transferred from the Contingencies Fund to a protected NDF.

c Establish or re-establish a mechanism for the rapid disbursement of financing of post-disaster expenses through Regulation 7 of the Financial Administration and Audit Act (FAA).

Given the time it takes to get approval for warrants to be issued to ministries for disaster-related expenditures (almost 3 weeks) relative to when the submissions are received by the MoFP, it may be prudent to further amend Regulation 7 of the FAA (Financial Responsibility Framework) Regulations 2015 to formalize the “advance” process and allow for exceptions or expedited actions by the Parliament’s Public Administration and Appropriations Committee to ensure that the process to facilitate the required expenditure is not hindered. Regulations 7(4) and 7(10) are important points of reference. Regulation 7(10) creates an exception for grant funding as the Financial Secretary does not have to include these in the report to the Public Administration and Appropriations Committee. These amendments would eliminate or reduce the bottlenecks.

In addition, there is need for specific time-bound financial instructions regarding the budgeting process post-event, with specified timelines to ensure that the process for allocating funds can be as short as possible.

6 Engage external development partners in establishing a contingent line of credit to finance public contingent liabilities associated with events with a 10-year return period.

Engaging international development partners to develop more-flexible instruments addresses not only reconstruction but also relief and recovery at a time when liquidity constraints are usually highest. The GoJ requires a broad menu of options to address DRF, and there is a need to develop a contingent line of credit that facilitates rapid disbursement of funds for medium- to high-intensity natural disasters, after the reserve fund has been depleted. To that effect, a World Bank Cat DDO instrument, IDB Contingent Credit Facility for Natural Disaster Emergencies or IMF RCF which is complementary to CCRIF SPC, can be customizable in terms of triggers and cost-effectiveness to optimize coverage of varying impacts of natural disasters.

Essentially, the contingent credit serves as bridge financing while funds from other sources (e.g., concessional funding, bilateral aid, or reconstruction loans) are being mobilized. Many contingent financing instruments have a “soft” (as opposed to “parametric”) trigger, and funds become available for disbursement after the declaration of a state of emergency due to a natural disaster. This estimate is based on a range of probable maximum losses (PML) for public contingent liabilities in a range of moderate to severe events, as described in Chapter 3. A percentage of this PML is extrapolated as “recovery” funding, which such contingent financing arrangement would cover.

While taking on contingent financing does increase public debt, there is an argument for increasing spending in times of a temporary economic shock like a natural disaster. Basic economic theory notes that a country should adjust to a negative permanent shock and cut spending, but if the shock is temporary, it can be financed and paid back later. In practice, however, policy makers face the extraordinarily difficult situation of needing to assess permanency of a shock in real time.

7 Establish a robust catastrophe risk insurance program for public assets and parastatals.

The GoJ could support the establishment of a disaster risk insurance program for key public assets in partnership with the private insurance industry. Most of the public assets, including critical assets such as hospitals and schools, are not currently insured against natural disasters. This program would aim to offer technical assistance to the public entities in the design of their catastrophe insurance coverage of public assets. Standardized terms and conditions for the property insurance policies would be developed, which would assist public managers in identifying their risk exposure and their insurance needs. The program

could also structure a national insurance portfolio of public assets that could be placed on the private (re)insurance market. A national property catastrophe insurance program for public assets would create economies of scale and diversification benefits, and thus lower reinsurance premiums.

The MoFP has a Public Expenditure Policy and Coordination Division, which has an Asset Management Unit.

This unit is responsible for recording information on the insurance of public assets. In contrast, public bodies are monitored by the MoFP's Public Enterprises Division. It is not clear why central government insurance of public assets should be separate from public bodies insurance of their assets. A general government approach should be taken with respect to disaster risk insurance, with a view to achieving minimization of risks by pursuing economies of scale and more-efficient pooling of risk, given the MoFP's fiduciary responsibility to provide oversight for this area.

The Quarterly Contract Awards database that insurance contracts are entered into does not have systematic coding, e.g., for health, life, assets (whether buildings/property or motor vehicles/ transportation) to allow for extraction of data. Descriptors need to be limited to ensure that the data filters can accurately segregate relevant information for DRF. Perhaps there could be a descriptor specific to disaster risk insurance and the event, e.g., health, earthquake, flood, or drought, added as a further descriptor if the insurance is that specific.

The MoFP recommends identifying some priority areas that need to be insured. The Public Expenditure Policy and Coordination Division has oversight for the insurance of public assets that can potentially be aligned with creating an inventory of public assets.

8 Enhance management of implicit contingent liabilities related to social protection (SP).

Flexible SP systems that are disaster-triggered and linked to DRM systems and contingent financing have the potential to reduce the administrative and financial burden of governments when responding to disasters. Post-disaster transfer mechanisms can be administratively and logistically cumbersome; identifying affected people is time-consuming and often inefficient, particularly in the aftermath of a disaster; and funds can take too long to reach those with immediate needs. Scalable programs with built-in risk mitigation and risk financing mechanisms can respond quickly to beneficiary needs within existing systems. These programs provide immediate assistance to poor people; protect development gains by preventing people from falling back into poverty after a disaster; and promote shared prosperity through better targeting, focusing on underlying factors affecting inequality, such as gender. To this end, these programs use census and survey data, as well as geospatial platforms, to locate vulnerable people.

Disaster-linked SP programs can also build the capacity of governments to provide timely and focused assistance to affected vulnerable populations in the aftermath of a disaster while protecting their long-term fiscal balance through risk financing instruments. This can be achieved by making full use of financial instruments that allow for a more efficient management of disaster-related liabilities. To ensure the effectiveness of such programs, quantifying the costs and benefits of disaster-linked SP schemes and their impact on budget is also key.⁶⁴

For example, the World Bank's "Strengthening Jamaica's Social Protection System for Disaster Preparedness and Response-RSR" (P159232) will finance design improvements in critical service delivery instruments to facilitate timely and appropriate response to poor and vulnerable households affected by disasters. In particular, the component will finance design of an improved instrument for identification of beneficiaries post-disaster; development of an operations manual for scalable SP, including detailed operational processes for post-disaster in-kind assistance, cash transfers, and cash-for-work; and development of an action plan on how to expand post-disaster payment mechanisms.

The project will also support the development of a curriculum for disaster responsive SP, the development of an information and education strategy on disaster response, and increased awareness of the role of SP in disaster preparedness and response among key stakeholders. The component will help increase the use of SP service delivery instruments by external agencies and provide a platform for these instruments to serve as the foundation for coordinated response to disasters in Jamaica.

9 Explore diaspora bond and catastrophe bond markets.

Based on its unique economic and demographic characteristics, Jamaica might consider further developing a diaspora bond program. A diaspora bond program would further diversify revenues, and this report recommends Jamaica undertake a cost-benefit analysis of engaging in such a program.

⁶⁴ World Bank. 2015b. R2D2: Responding to Disasters Together. Washington, DC: World Bank.

Box 2: Countercyclical Argument for Increasing Spending after a Temporary Shock

"By definition, a prudent policymaker will tend to put more weight on a positive shock being temporary and a negative shock being permanent. As a result, the prudent policymaker may, on average, save too much in good times and dis-save (or borrow) too little in bad times. This 'excessive' saving could be viewed as the cost of self-insurance, and hence a price that needs to be paid for living in shock-prone or more volatile external environments. Interestingly enough, in bad times a prudent policy maker may mimic, to some extent at least, a procyclical policy maker. But, if anything, this should be viewed as an additional argument to seek the blessings of countercyclical fiscal policies since market-based insurance (which would clearly be the first-best scenario) should be more readily available to countries with higher credit ratings."

Vegh, Carlos; Lederman, Daniel; and Bennett, Federico R. 2017. *Leaning Against the Wind: Fiscal Policy in Latin America and the Caribbean in a Historical Perspective*. IAC Semiannual Report. Washington, DC: World Bank. Available at: <https://openknowledge.worldbank.org/handle/10986/26364> License: CC BY 3.0 IGO.



Jamaica received USD 2.36 billion (J\$ 303.94 billion) in personal remittances in 2015.⁶⁵ If the GoJ can successfully harness remittance flows during times of disaster, by convincing the diaspora to redirect or increase remittance payments into public assistance, diaspora bonds represent a potential external instrument for borrowing. These bonds provide an alternative to costly foreign borrowing.

The success of using such bonds relies heavily on the "patriotic discount" based on variables of trust in governance and the patriotism of the diaspora.⁶⁶ Israel, since 1951, and India, since 1991, have been in the forefront in raising hard-currency financing from their respective diaspora. Israeli bonds have been sold globally, with sales approaching USD 40 billion (J\$ 5 trillion). On the other hand, India has used issuances of diaspora bonds in periods of financial turmoil by, in 1991, offering "India Development Bonds" during a balance of payments crisis and, in 1998, offering "Resurgent India Bonds."

Private Insurance Market

10 Enhance availability, penetration, and affordability of private and residential catastrophe insurance, for example, through public-private partnerships (PPPs), and micro-insurance schemes, for example, through the Livelihood Protection Program (LPP).

It is important that the government and the insurance industry tackle together the issues of expanding penetration of property insurance against natural disasters and making insurance accessible to vulnerable populations. Acting alone, the insurance industry may focus on short-term profitability, and shield itself from hard-to-address risks in vulnerable populations. On the other hand, if the public sector worked alone, products might not be as efficient and protection could be costly. The GoJ also faces the risk of implementing policies that compete with or reduce the incentives to purchase insurance. A PPP can reduce and manage ex ante risks, adapt to the needs of different sectors of society, and lead to sound policy making and DRF decisions.⁶⁷

The IAJ is well positioned to partner with the GoJ in designing a PPP for catastrophe insurance. The local insurance industry has historically proved, through its response to and recovery from Hurricane Gilbert in 1998, that it has the capacity to respond to severe events.⁶⁸ Through interviews with the DRFTA Project, the industry has also demonstrated a desire to work with the GoJ to expand natural disaster protection throughout the island.

Perhaps warranting further involvement and support from the GoJ, the LPP allows individuals to select levels of parametric insurance coverage for rainfall and wind hazards. If triggered, the client receives a message on her or his mobile phone and an automatic payout to her or his bank account. After the LPP was piloted in the parish of St. Thomas, with the St. Thomas Credit Union as the designated distribution channel in September 2013, the local insurer introduced the policy nationwide. The product is now being offered by Grace Kennedy through its insurance subsidiary, JIIC, in partnership with select local credit

⁶⁵ World Bank DataBank, 2017.

⁶⁶ Akkoyunlu, Sule and Maximilian Stern, "Empirical Analysis of Diaspora Bonds." The Graduate Institute of Geneva, Research Paper 3, 2012.

⁶⁷ Ramm, G. 2011. Public private partnerships in microinsurance, Discussion Paper No. 001 (Luxembourg, Microinsurance Network).

⁶⁸ OAS General Secretariat. 1996. "Insurance, Reinsurance and Catastrophe Protection in the Caribbean." Working paper prepared in collaboration with the World Bank and the USAID-OAS Caribbean Disaster Mitigation Project.

unions and the People's Cooperative Bank. The policies have no location or occupation exceptions. The program was developed by the Munich Climate Insurance Initiative in partnership with the CCRIF SPC.⁶⁹

Figure 18: Advantages of PPPs to Governments and the Insurance Industry⁷⁰

Advantage for governments

- Microinsurance can bring a client-centred approach to product development. Beneficiaries of public programmes can experience reduced payout times and improved benefits. The private sector may be able to deliver benefits more effectively and efficiently.
- Data on different risks can be developed over the long term to be able to price and transfer risk in a more efficient way, while contributing to greater public transparency.
- PPPs can create better budget management, as insurance premiums can help to bring certainty around contingent events that have a severe impact on public finances.
- Insurance mechanisms can help to align incentives within the government to set up the policies that can reduce the exposure to risk of particular groups.

Advantages for the insurance industry

- Access to programme with scale can help reduce operational and premium costs. Scale can help to improve value for final beneficiaries.
- Collaboration with the government provides opportunities for improved data collection, which can lead to better pricing and beneficial competition.
- Insurance PPPs can increase the capacity of the industry to deal with bigger volumes of clients and premiums, while fostering national financial risk-transfer mechanisms.
- Joint work with government can help to change the exposure to risk of the population, making insurance protection sustainable for both insurers and reinsurers.

11 Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for smallholder farmers.

The GoJ does not set aside specific funds to deal with negative impacts that natural disasters have on the agricultural sector. As a result, any liabilities that the government assumes in order to assist farmers are implicit and ad hoc. For example, the Hurricane Sandy Recovery Program was instituted to minimize the effects of the adverse weather conditions on the agricultural sector.⁷¹ The fact that funds are not explicitly set aside implies that the government must either reallocate budgeted resources to deal with such disasters or find other sources of income given its fiscal constraints.

At times, international organizations and bilateral agencies provide funds for recovery, but government resources are also likely also used to supplement that assistance. For example, in the aftermath of Hurricane Dean in 2007, USD 243,000 (J\$ 31 million) was distributed to greenhouse farmers through contributions made by the MoAF, the Inter-American Institute for Cooperation and Agriculture, and USAID. At the same time, the GoJ declared its contribution of USD 2 million (J\$ 258 million) to assist in providing seeds; fertilizers; and support for crops, such as banana, fruits, and coffee.⁷²

The burden on the agricultural sector is worsened because of the nonexistence of crop insurance. In the past, banana and coffee farmers had insurance, but these schemes have been dissolved. The coffee insurance scheme ended in 2006 because of such issues as difficulties in assessing losses, farmer's non-registration, and the questionable basis for the operation of the scheme itself.⁷³ Since 2011, consideration has been given to the possibility of the re-establishment of a weather insurance scheme for the coffee industry. The banana industry insurance fund ceased to exist after banana production for export nearly disappeared following a major hurricane in August 2008.

The focus since then has been on producing for local consumption.⁷⁴ Producing for local consumption can be considered as subsistence output—that is, quantity that is enough to meet local demand both by households and by food and hotel industries. On the other hand, productive agriculture can be seen as output that is produced for both local and export purposes. The distinction between the two is important. Subsistence-level output has direct bearing on national food security, while productive-level output affects national food security and the ability to export and attract foreign earnings.

⁶⁹ JIIC. 2013.

⁷⁰ Excerpt from "Making public-private partnerships work in insurance." 2015. Paper no. 40. Geneva: International Labor Office.

⁷¹ PIOJ. 2013. "Agriculture." Economic and Social Survey of Jamaica.

⁷² Jamaica Information Service. 2015. "Gov't Boosting National Disaster Fund." Available at: <http://jis.gov.jm/govt-boosting-national-disaster-fund/>.

⁷³ MoAF. 2011. "Jamaica: Weather industry for the coffee sector feasibility sector." World Bank Latin America and Caribbean.

⁷⁴ For more information: <http://thebananaboard.org/pdf/ANNUAL%20REPORT%202009%20Edited%20versiondoc-1.pdf>.

A lack of contingency funds and insurance schemes for agriculture has implications for government debt.

Table 11 shows the losses sustained by Jamaica's agricultural sector from major tropical storms. This report recommends further study and consideration of developing insurance products for smallholder farmers as a medium-term goal.

Table 12: Estimates of Direct Hurricane and Rainfall Damage to Agriculture

Year	Hurricane, Tropical Storm	J\$ billion	% of Agriculture GDP
1988	Gilbert	8.8	Not available
2004	Ivan	8.55	27.6
2005	Emily, Dennis, Wilma	0.99	2.7
2007	Dean	3.76	9.1
2008	Gustav	1.63	3.3
2010	Nicole	0.58	Not available
2011	Unnamed low pressure	0.14	Not available
2012	Sandy	1.43	Not available

Source: MoAF.

Annex 1. Operational Disaster Risk Financing and Insurance Framework

Table A-1: Actions Taken by Governments for Financial Protection

Actions by Governments for Financial Protection of the State		Actions by Governments for Financial Protection of Society		
Actions	Government – National & Local (Sovereign DRFI)	Beneficiaries		
		Homeowners and SMEs (Property Cat Risk Insurance)	Farmers and Herders (Agricultural Insurance)	Low income population (Social Protection)
Assess Risks	<ul style="list-style-type: none"> Collect and manage risk and loss data Quantify potential disaster related losses from fiscal and budget perspective Assess potential post-disaster (short term and long term) funding gaps 	<ul style="list-style-type: none"> Collect and manage risk and loss data Quantify potential disaster related losses from property damage Identify proportion of losses incurred by public and private stakeholders Assess capacity of domestic insurance markets 		<ul style="list-style-type: none"> Collect and manage disaster risk and loss/impact data Quantify potential disaster related losses on low-income population Quantify fiscal impact of potential disaster related losses through social protection programs
Arrange Financial Solutions	<ul style="list-style-type: none"> Develop Financial decision making tools Develop national strategy for financial protection <ul style="list-style-type: none"> Secure immediate liquidity for budget support following disasters: risk layering including reserves, contingent credit, and catastrophe risk transfer Secure longer term reconstruction financing, e.g., insurance program for public assets 	<ul style="list-style-type: none"> Promote domestic demand for insurance <ul style="list-style-type: none"> Financial incentives through premium subsidies and/or tax breaks Compulsory vs voluntary schemes Awareness/education of consumers on insurance products Develop domestic supply of insurance Assess legal and regulatory environment to allow private sector to develop/test private insurance solutions while protecting consumers Risk data collection, management and sharing Product development (indemnity and index based) Insurance pools 		<ul style="list-style-type: none"> Secure contingent funding for social protection programs against disasters Complement/enhance social protection programs with insurance principles and market-based products including use of transparent for payouts
Deliver Funds to Beneficiaries	<ul style="list-style-type: none"> Establish national disaster fund Establish transparent, timely and effective post disaster loss reporting mechanisms Establish post disaster budget execution mechanisms to transfer funds from national to subnational level and from MoF to line ministries 	<ul style="list-style-type: none"> Develop risk market infrastructure to support delivery channels <ul style="list-style-type: none"> Underwriting and claims settlement process Delivery channels through insurance agents Alternative delivery channels: Banks, micro-finance Intermediaries, input providers, NGOs, etc. 		<ul style="list-style-type: none"> Improve beneficiary targeting and assessing eligibility for post-disaster payouts
Linkages to DRM	<div> <div>▼</div> <div>Reduce Underlying Drivers of Risk</div> <div>▼</div> </div>			

Table A-2: World Bank DRFI Program Operational Framework – Illustrative Examples of Financial Protection

Beneficiaries	Government – National and Subnational (Sovereign DRFI)	Homeowners and SMEs (Property Catastrophe Risk Insurance)	Agricultural Producers and Herders (Agricultural Insurance)	Low Income Population (Social Protection)
Assess Risks	<p>The Government of Colombia included the assessment of contingent liabilities from disasters in the government's fiscal risk management strategy.</p> <p>In Mexico, R-FONDEN a probabilistic catastrophe risk modeling tool, creates probabilistic simulations of potential material and human losses from disasters.</p> <p>Morocco has developed a probabilistic catastrophe risk modeling tool to assist the government in prioritizing their risk mitigation investments.</p> <p>The Philippines is developing a catastrophe risk model to evaluate options for risk transfers and insurance to reduce the fiscal burden of disasters.</p> <p>The Pacific Risk Information System, under the Pacific Catastrophe Risk Assessment and Financing Initiative, includes a database of over 3.5 million georeferenced buildings and infrastructure in 15 Pacific Island Countries. It was used to develop the Pacific catastrophe risk insurance pilot.</p>	<p>In Chinese Taipei, the Residential Earthquake Insurance Fund (TREIF) has developed an earthquake risk model to strengthen the independence and professionalism of its earthquake risk assessments.</p> <p>The preparation of the Southeast Europe and Caucasus Regional Catastrophe Risk Insurance Facility includes extensive multihazard country risk assessments for climate and geological hazards.</p>	<p>India has developed detailed agricultural risk assessment tools to help policymakers to better understand the economic consequences of drought, quantify such impacts, and investigate the impacts of risk coping strategies, at both the farm and state levels.</p> <p>In Mongolia, livestock census/surveys are used to inform the government about the economic and fiscal impact of adverse weather events, and in the design and pricing of index based livestock insurance policies.</p>	<p>India has developed detailed agricultural risk assessment tools to help policy makers to better understand the economic consequences of drought, quantify such impacts, and investigate the impacts of risk coping strategies, at both the farm and state levels.</p>
Arrange Financial Solutions	<p>Contingent lines of credit provide developing countries with funds immediately following disasters. Products are offered by the World Bank, IDB and JICA.</p> <p>The first multi-country risk pool, the Caribbean Catastrophe Risk Insurance Facility, established in 2007, offers 16 small island states countries over USD150 million in hurricane and earthquake coverage.</p> <p>In 2006, Mexico transferred USD450 million of earthquake risk to financial markets by combining the world's first government catastrophe (cat) bond (Cat MEX – USD160 million) and parametric reinsurance (USD290 million).</p> <p>In Colombia, the government uses standardized terms and conditions informed by international best practices to purchase catastrophe insurance for its public buildings.</p>	<p>The Turkish Catastrophe Insurance Pool (TCIP), a public private partnership with the domestic insurance industry, provides compulsory, affordable earthquake insurance to homeowners, increasing catastrophe insurance coverage from less than 3 percent to over 40 percent of residential buildings in urban areas.</p> <p>The Japanese public-private earthquake insurance program for homeowners relies on the Japan Earthquake Reinsurance Company (JERC), an earthquake reinsurance pool backed by the government.</p>	<p>The Index-Based Livestock Insurance Pilot in Mongolia protects the livelihoods of 11,000 herders or 22 percent in piloted provinces in 2012.</p> <p>India's weather based crop insurance has been in place since 2007 for 11 growing seasons, with 11.6 million farmers and USD 370 million covered in the most recent season. While the national crop insurance program since 2010 offers more than 1.1 million farmers a total of USD 67 million coverage in yield crop insurance.</p> <p>In Morocco, the government and the agricultural mutual insurance company have established a crop insurance program for cereals which currently covers 700,000 ha and will soon be extended to fruit trees.</p>	<p>The Productive Safety Net Programme (PSNP) in Ethiopia is aimed at enabling the rural poor facing chronic food insecurity to resist shocks, create assets and become food self-sufficient.</p> <p>In 2011, reinsurance company MiCRO (Microinsurance Catastrophe Risk Organization) was established to provide insurance coverage to women-owned microenterprises in Haiti.</p> <p>Insurance products of the Center for Agriculture and Rural Development Mutual Benefit Association (CARD MBA) in the Philippines are mandatory for members of a network of institutions including CARD NGO and CARD Bank, providing scale and preventing adverse selection.</p>

Beneficiaries	Government – National and Subnational (Sovereign DRFI)	Homeowners and SMEs (Property Catastrophe Risk Insurance)	Agricultural Producers and Herders (Agricultural Insurance)	Low Income Population (Social Protection)
Deliver Funds to Beneficiaries	<p>The Government of Mexico established a post-disaster loss reporting mechanism managed by FONDEN. Affected states can therefore access timely payments from the Natural Disaster Fund (FONDEN), reducing time-consuming coordination problems.</p> <p>In the Cook Islands, the establishment of the Disaster Emergency Trust Fund has served to reduce delays in emergency response.</p>	<p>As a public private partnership the Turkish Catastrophe Insurance Pool relies on the domestic insurance market for the distribution and claims settlement.</p>	<p>Distribution in the Moroccan multi-peril crop insurance program takes place either by linkage to loans made by Crédit Agricole or by direct marketing of MAMDA, the sole provider of agriculture insurance in the country, structured as a mutual.</p> <p>The national crop insurance program in India uses GPS enabled mobile phones and video recording technology to enhance crop cutting experiments, improving the accuracy of claims assessments while reducing fraudulent claims. Claims settlement takes place through direct payment to bank accounts.</p>	<p>HARITA was launched in Ethiopia in 2007 as a pilot program to address the needs of small-scale farmers through drought insurance, credit, and risk reduction, allowing farmers to pay for insurance through labor, an idea based on “food-for-work” programs.</p> <p>MiCRO’s coverage in Haiti is bundled with loans from Fonkoze, the country’s largest microfinance institution.</p>
Linkages to DRM	<p>Mexico’s natural disaster fund FONDEN has evolved to include financial accounts to finance investment in risk reduction. It promotes informed decision by requiring states to complete a risk assessment (including development of a risk atlas) before being eligible for financing for risk mitigation projects</p>	<p>After setting up the TCIP, the Government of Turkey legally abolished its obligation to fund the reconstruction of residential dwellings following earthquakes, strengthened building construction codes, and enhanced supervision thereof.</p>		<p>Members of PSNP households must participate in productive activities that will build more resilient livelihoods, such as rehabilitating land and water resources and developing community infrastructure, including rural road</p>

Annex 2. Jamaica Country Disaster Risk Profile

COUNTRYDISASTER
RISK PROFILES WORLD BANK GROUP

JAMAICA Hurricanes and Earthquakes RISK PROFILE

What is a country disaster risk profile?

An estimation of the potential economic losses to property caused by adverse natural hazards.

Country Disaster Risk Profile

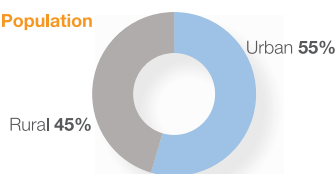
Applications

- ▷ Inform disaster risk financing
- ▷ Develop key baseline data
- ▷ Evaluate impact of disasters
- ▷ Promote and inform risk reduction

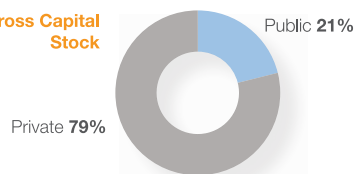
Country At-A-Glance

GDP US\$ 13.9 billion | Population 2,720,000 | Total Building Exposure US\$ (Replacement Value) 36.4 billion

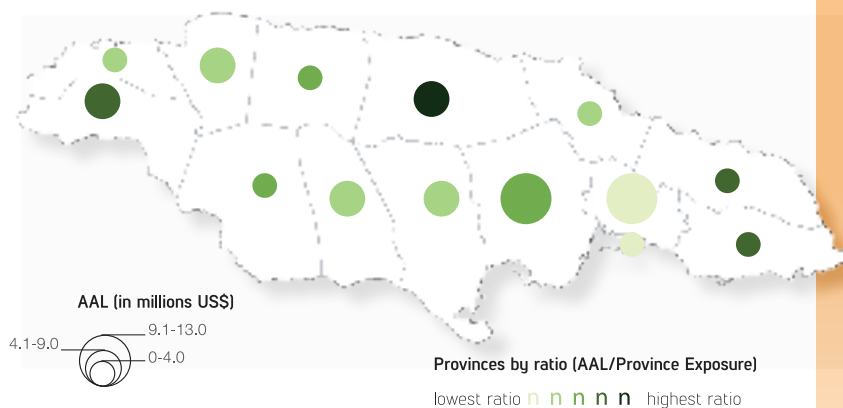
Population



Gross Capital Stock



Two representations of hurricane risk



Absolute Risk: The larger the circle, the higher the Annual Average Losses that the province could potentially incur over the long term.

Relative Risk: The darker the color, the higher the ratio of AAL/Province Exposure. The darkest color represents the province of Saint Ann which has a higher proportion of vulnerable structures due to construction types and/or potentially higher hurricane intensity.



Snapshot

▷ The **hurricane risk** in Jamaica is **more significant** than the **earthquake risk**.

▷ Annual Average Loss (AAL) from **hurricanes** is **US\$ 67.3M (0.5% of GDP)** and from **earthquakes** is **US\$ 36M (0.3% of GDP)**.

▷ The Probable Maximum Loss for **hurricanes** (250 year return period) is **US\$ 3.5B (25.3% of GDP)** and for **earthquakes** (250 year return period) is **US\$ 2B (14.6% of GDP)**.

▷ Single-family, wood stud-wall frame with plywood/gypsum board sheathing, as well as reinforced masonry bearing walls with concrete diaphragms, are the buildings most vulnerable to **hurricanes**, **each category accounting for 23% of AAL**.

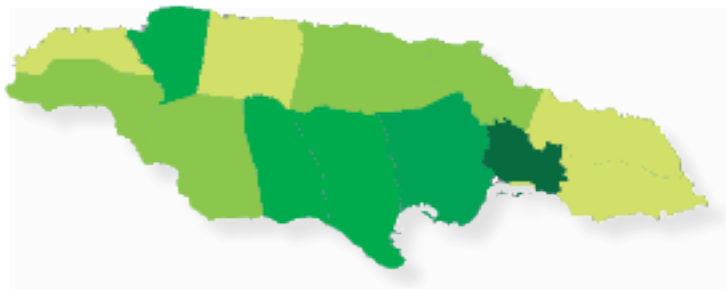
COUNTRYDISASTER RISK PROFILES

JAMAICA

What is at risk?

Economic assets such as residential and non-residential buildings are at risk. These assets that are exposed to natural disasters are referred to as a country's **Building Exposure**.

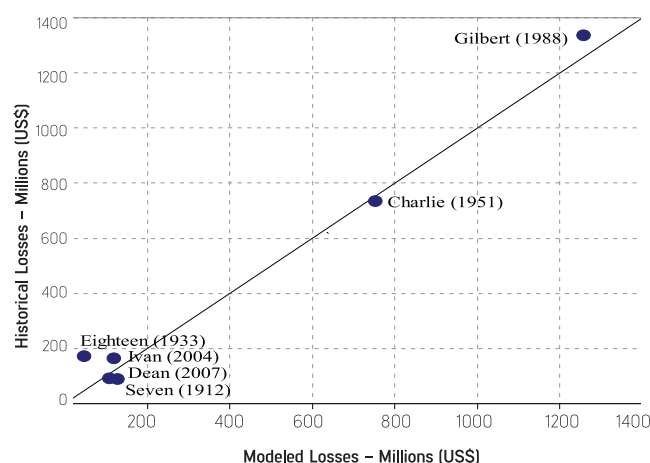
The map provides the value of residential and non-residential buildings in each province at risk from hurricanes and earthquakes.



Building Exposure

(in percentage of total)

n 24 - 35 n 36 - 70 n 71 - 150 n 151 - 250 n 251 - 267

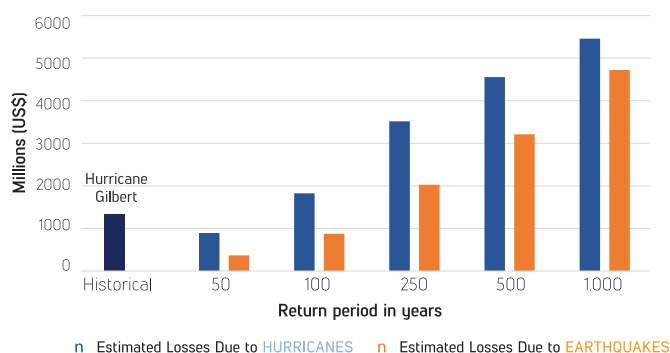


What have been the historical losses?

Jamaica has suffered significant losses from hurricanes. The direct losses have been modeled to a high degree of accuracy in the risk profile. In 1988, Hurricane Gilbert struck Jamaica. If this historical event were to happen in 2016, it would cause a loss of US\$ 1.3B, amounting to 9.6% of GDP.

◀ The chart shows the direct actual and modeled losses due to historical events.

What are the potential future losses?



◀ The chart shows the estimated potential future losses in Jamaica that could be caused by hurricanes and earthquakes for a given return period.

This is the first step of quantification of contingent liability. Next steps include determining its impact on budgetary appropriation, which would directly inform the development of the disaster risk financing strategy.

To learn more, visit: collaboration.worldbank.org/groups/cdrp or email cdp@worldbank.org



Annex 3. DRFTA Methodology of Quantifying Contingent Liabilities

Box A3-1: Probabilistic catastrophe risk modeling

Fiscal disaster risk assessments for governments can be developed using inputs from probabilistic catastrophe risk models. Catastrophe modeling techniques were originally developed by the international (re)insurance industry to assess the risk on portfolios of underwritten assets (e.g. buildings) and are increasingly being used by governments to analyze their exposure to adverse natural events. Typically, catastrophe risk models comprise the following components:

Exposure Module: This is a geo-referenced database of assets at risk, capturing important attributes such as geographical location, type of occupancy (e.g. residential, commercial, industrial, agricultural) and construction (e.g. wood, steel, masonry), age and number of stories.

Hazard Module: This module contains a catalog of thousands of potential natural catastrophe events that could occur in a region, each one defined by a specific frequency and severity of occurrence. Analyses are performed on the historical occurrence of catastrophic events to capture the extent of possible events, based on expert opinions.

Vulnerability Module: This is a series of relationships which relate the damage to an asset to the level of intensity of a peril (e.g. ground shaking for earthquakes, wind speed for tropical cyclones). The relationships will vary by peril and by the characteristics of each asset; for example, a small wooden house and a tall concrete building will respond in different ways to a ground shaking caused by an earthquake and as such, they will be damaged in different ways and to different extents. On a larger scale, for instance when analyzing an entire neighborhood or city, proxies may be used to capture the overall vulnerability of an area.

Loss Module: This module combines the information in the other three components in order to calculate the overall losses expected for selected perils impacting a portfolio of assets of interest. Typically, there are two kinds of risk metrics produced: average annual losses (AALs) and probable maximum losses (PMLs). The AAL is the expected loss, on average, every year for the risks being analyzed; while the PMLs describe the largest losses that might be expected to occur for a give return period (within a given time period), such as a 1-in-50 year loss or a 1-in-250 year loss.

Risk metrics produced by probabilistic catastrophe risk models can be used to complement historical analyses and are particularly useful to policy makers in assessing the probability of losses and the maximum loss that could be generated by major events (e.g. an earthquake affecting a major city or a cyclone affecting a major port).

Box A3-2: Loss Risk Estimation Data, Methodology, and Key Assumptions

The technical results derive from an actuarial analysis of past floods and wind-related events in Jamaica. This analysis is based on empirical analysis of past losses and not on a probabilistic catastrophe model.

Although basic cross-validation of the data were completed, any material errors in the underlying data could affect the results of this technical analysis.

Methodology

The methodology followed these steps:

- Historical losses were compiled into a single table by event. Whenever the data was available, sectorial losses were recorded.
- Proxies to extract direct losses to the building stock, direct losses and public losses out of the total losses were determined by sector and more globally by event.
- Losses were then updated to 2015 USD values.
- Theoretical and statistical analysis validated the use of the Extreme Value Theory, and Generalized Pareto Distributions are fitted for each of the 4 categories of evaluated historical losses: direct losses to the building stock, direct losses, public losses and total economic losses. Occurrences of losses above an upstream defined threshold are simulated via a Poisson distribution.
- Focusing on the fitted direct losses to the building stocks, distributions of losses from the actuarial analysis and from the catastrophe risk model coincide for low-frequent losses. A mix of the distributions is operated: (i) actuarial analysis complemented results from the catastrophe model for the most frequent losses within the tail distribution; and, (ii) another statistical distribution for the rest of the tail was fitted based on the catastrophe risk model's results.
- Results for the low-frequent losses of the tail distribution of direct losses to the building stock were extrapolated to the 3 other categories to complement the results previously derived for more frequent losses within the tail distribution.

Assumptions

The analysis uses the following key assumptions:

- There are no material errors or omissions in the data underlying the disaster damage report.
- The developed proxies to estimate the portions of direct losses to the building stocks, direct losses and public losses are based on historical sectorial losses information drawn from Damage and Loss Assessment (DaLA) reports and from an inventory of public assets. They are reasonable approximations.
- The use of the CPI index to update the historical losses to 2015 USD value is legitimate.
- The use of the Poisson distribution and the Extreme Value Theory is legitimate and the fitted statistical distributions are reasonable approximations of the occurrence and loss impact of natural disasters.
- Results derived from the catastrophe risk model for high return periods can be extrapolated to other categories of losses arisen from disasters; each category of loss follows the same type of distribution for high return periods.

Source: World Bank DRFTA Project.

Annex 4. External Resources for Disaster Management, 2004–2014 – Approvals for Reconstruction

Year	Ministry	Project	Original Duration	Final Duration	Original Budget	Final Budget
2005	Local Government & Community Development	0637 – Flood Damage Rehabilitation, Reduction of Fluctuation in Export Earnings (FLEX) Grant from European Union)) ¹	April 2005 – March 2006 (12 months)	April 2005 – June 2011 (75 months)	J\$160.0mn	J\$160.0mn
2008	Transport & Works	9084 – Emergency Assistance for Hurricane ² (Loan from Inter-American Development Bank ³)	March 2008 – March 2009 (13 months)	March 2008 – March 2009 (13 months)	J\$714.97mn	J\$714.97mn
2008	Transport & Works	9252 – Tropical Storm Gustav Rehabilitation Works ^{4,5}	Oct 2008 – April 2010 (19 months)	Oct 2008 – March 2012 (42 months)	J\$31,396.5mn (J\$439.65mn GoJ)	J\$3,096.15mn
2008	Agriculture and Fisheries	9293 - Gustav Agricultural Rehabilitation Project ⁶ (Grant resources from the United States Agency for International Development - USAID)	Nov 2008 – Sept 2009 (11 months)	Nov 2008 – Sept 2012 (47 months)	J\$270.80 mn (J\$14.80mn GoJ)	J\$270.80 mn
2008	Transport & Works	9310 - Natural Disaster Management – Hurricane Dean Rehabilitation Works ⁷ (Loan from Caribbean Development Bank)	March 2008 – Dec 2009 (22 months)	March 2008 – Dec 2009 (22 months)	J\$1,735.027mn (J\$294.295m GoJ)	J\$1,735.027mn
2010	Transport & Works	9359 – Tropical Storm Nicole - KMA Drainage ^{8,9} (Loan from Caribbean Development Bank) * Only outstanding payments remain to be paid in FY 2015/16 for work already verified. ¹⁰	Nov 2010 – Nov 2013 (37 months)	Nov 2010 – Dec 2014 (50 months)	J\$2,621.61mn (J\$281.52mn GoJ)	J\$2,768.62mn
2010	Transport & Works	9334 - Palisadoes Shoreline Protection and Rehabilitation Works ¹¹	July 2010 – June 2012 (22 months)	July 2010 – Jan 2014 (41 months)	J\$5,883.93mn (J\$652.950mn GoJ)	J\$5,883.93mn
2010	Transport & Works	9369 - Natural Disaster Management – Immediate Response Tropical Storm Nicole (Loan from Caribbean Development Bank)	Nov 2010 – March 2012 (17 months)	Nov 2010 – March 2012 (17 months)	J\$70.2mn (J\$2.7mn GoJ)	J\$70.2mn
TOTAL						J\$14,699.387mn

1 The Monitoring Report indicates that Delay in signing Financing Agreement resulted in 24 month delay in implementation, initially.

2 The loan provided USD 10 million in resources for the reimbursement of the emergency response expenditures of the GoJ during the period August to October 2007 and other proposed expenditures. The IDB reimbursed for the 2007 Atlantic Hurricane season one year later. The MTWH implemented the Activities under Program 005 (Disaster Management) and sub-program 09 (Flood Damage).

3 The GoJ actually used the resources for recovery.

4 The project was 98 percent complete as at February 2010. However, the Supplementary cut the budget to J\$ 750 million which was insufficient and given that the project was not to extend beyond FY 2010/11, this "over expenditure" had to be partly recognized in FY 2010/11, which impacted the 2011/12 budget by reducing available fiscal space for project implementation. See page 8 in section B9 (MTWH) of the Projects Branch's Monitoring Report for February 2010.

5 The Executive Summary of the February 2010 Monitoring Report outlined the fiscal constraints caused by over-expenditure on two projects as well as the Stand-by Arrangement (SBA) with the International Monetary Fund (IMF).

6 The objective of this project was to assist in the rehabilitation of the agricultural sector through improvement of the rural road infrastructure and in production and productivity of targeted crops.

7 J\$ 981.547 million was allocated in the FY 2008/09 budget but this was revised down to J\$ 80.0 million in the Supplementary. This was in section B9 (MTWH) of the February 2009 Monitoring Report of the Projects Branch of the Ministry of Finance and Planning.

8 The Executive Summary for the February 2011 Monitoring Report highlight that the significant addition to the capital budget was J\$ 870.0 million for this project.

9 The report cited a number of issues that contributed to increased costs and suggested a mitigating measure. Labor issues were also cited as cause for delay in a few instances where community leaders were "dictating where laborers could and could not work."

10 It should be noted that section B11 (MTWH) of the Monitoring Report in for October 2013 - March 2014 highlighted the benefits of devaluation. Devaluation may provide additional funds to expand the scope of the works to be undertaken. At March 2014, works were 97 percent complete with 90 percent of project cost expended. The additional works required an extension of the contract to December 2014.

11 Each Supplementary in successive fiscal years increased the allocation to this project.

Source: Author's Review and compilation from the Estimates of Expenditure for Fiscal Years 2004 – 2014 and Ministry of Finance and Planning, Public Expenditure Division, Projects Branch Monitoring Reports for 2004 – 2014: Major Projects Funded by the Government of Jamaica and Multi-lateral/Bilateral Projects.

Annex 5. Terms of Reference for Operating the National Disaster Fund

TERMS OF REFERENCE FOR OPERATING OF THE NATIONAL DISASTER FUND

BACKGROUND

For over a number of years funds were donated from other countries to assist with response to disasters. Individual accounts were usually opened for these funds. This National Disaster Committee took the decision that all balances should be transferred to one main account called the "National Disaster Fund". The fund was placed in the Bank of Jamaica and monitored by the Ministry of Finance and Planning.

At the Regional Disaster Committee Meeting in May 1995 there was general agreement that the Fund should be transferred to the Office of Disaster Preparedness and Emergency Management (ODPEM) in light of that Agency's responsibility for disaster management. In addition, it was recognized that the ODPEM received contributions from overseas agencies and that in some instances donors are more disposed to contribute to a specialised agency responsible for disaster management than to the Ministry of Finance.

Cabinet gave approval for the transfer of the National Disaster Fund to the ODPEM with effect from June 1, 1996 vide Cabinet Decision No 19/96 dated May 27, 1996.

ADMINISTRATION

1. The National Disaster Committee is responsible for the national Disaster Fund and shall ensure that it is used in a fair and impartial manner. The National Disaster Committee has delegated the responsibility for the management of the Fund to a Finance and Administration Sub-Committee in keeping with Cabinet Decision No 19/96 dated May 27, 1996.
2. The Finance and Administration Sub-Committee responsible for the management of the fund is as set out below:

Chairperson	-	Financial Secretary, Ministry of Finance and Planning
Member	-	Director-General, ODPEM
"	-	Chairman, ODPEM Board of Management Finance and Administration Sub-Committee
"	-	Executive Director, Private Sector Organisation of Jamaica
"	-	President, Bankers Association of Jamaica
"	-	Permanent Secretary, Ministry with portfolio responsibility for ODPEM
"	-	President, Jamaica Red Cross Society
"	-	Territorial Commander, Salvation Army
"	-	Director, Adventist Development and Relief Agency
"	-	Senior Director Corporate Services/Company Secretary, ODPEM

Four (4) members will form a quorum and the Senior Director Corporate Secretary, ODPEM will be Secretary to the Sub-Committee.

3. The Sub-Committee will be responsible for the investment of the Fund in fixed income securities and bank deposits through Financial Institutions approved by the Sub-Committee and the Ministry of Finance and Planning.
4. Quarterly reports will be issued to the National Disaster Executive and ODPEM Board of Management and this report will form a part of ODPEM's Annual report and Audited Accounts.
5. All disbursements from the fund will require authorization of the Chairman of the National Disaster Committee or his Designate acting on recommendations from the Finance and Administration Sub-Committee. Except in the event of an emergency without warning (e.g. earthquakes) Office of Disaster Preparedness and Emergency Management (ODPEM) will be able to spend a maximum of the Jamaican equivalent of US\$30,000.00.
6. The fund will be audited annually by the Auditor General.
7. The Ministry of Finance will make an annual contribution to the fund in addition to local and foreign donations. This amount is subject to annual review.
8. All donations received towards the fund will be deposited to the account and allocated subject to donor conditionalities.
9. The Administration of the fund will be subject to the Financial and Audit Act (1959).

PURPOSE OF THE FUND

The fund is to be used for the following:

- to facilitate rapid response to disasters and major incidents to include Floods, Hurricanes, Fires, Skops, Failures, Hazardous Materials, Incidents, Asylum Seekers/Illegal Immigrants, Earthquakes, Drought, Epidemics and Accidents in keeping with the National Welfare Sub-Plan.
- To provide supplementary resources to ensure that adequate stocks of emergency supplies and equipment are maintained in support of:
 - a) logistic commitments and damage assessment; and
 - b) public education
- to facilitate the regional disaster response as the Sub-Regional Focal point of Caribbean Disaster Emergency Response Agency (CDERA).



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