

Advancing Disaster Risk Finance in Saint Lucia

SOCIAL, URBAN, RURAL AND RESILIENCE GLOBAL PRACTICE
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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
CERC	Contingent Emergency Response Component
CoA	Chart of Accounts
DaLA	Damage and Loss Assessment
DANA	Damage Assessment and Needs Analysis
DOC	Detailed Object Code
DRF	Disaster Risk Finance
DRFTA	Disaster Risk Finance Technical Assistance
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DVRP	Disaster Vulnerability Reduction Project
ECCU	Eastern Caribbean Currency Union
EDF	Emergency Disaster Fund
EP	Exceedance Probability
FAA	Financial Administration Act
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GoSL	Government of Saint Lucia
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin America and Caribbean
LPP	Livelihood Protection Policy
MoF	Ministry of Finance, Economic Growth, Job Creation, External Affairs and the Public Service
NEMO	National Emergency Management Organization
ODP	Office of Disaster Preparedness
PEFA	Public Expenditure and Financial Accountability
PFM	Public Financial Management
PML	Probable Maximum Loss
PPP	Public-Private Partnership
SIDS	Small Island Developing States
SOC	Standard Object Code
WINCROP	Windward Islands Crop Insurance Ltd

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 the 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 Saint Lucia insures low-income individuals from wind and excess rain.

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 Saint Lucia in 2007, with direct losses that amounted to USD 12 million (EC\$ 32 million) in assets and stocks.

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 Saint Lucia amounted to USD 6 million (EC\$ 16 million). Adding the direct economic losses of USD 12 million (EC\$ 32 million), Hurricane Dean accounted for USD 18 million (EC\$ 49 million) in economic losses.

Facultative reinsurance/treaty 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., Saint Lucia has high fiscal risks to disasters: Losses modeled by the Caribbean Catastrophe Risk Insurance Facility for tropical cyclone events show that a 1-in-100-year event could result in an economic loss of at least USD 121 million (EC\$ 327 million).

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 inverse 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 than 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 Saint Lucia (GoSL) 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 Saint Lucia. 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, Economic Growth, Job Creation, External Affairs and the Public Service (MoF) with information and instruments to manage contingent liabilities posed by natural disasters.

On average, in the long term, the GoSL would need to cover losses of approximately USD 15.8 million (EC\$ 42.7 million) annually, – 1.10 percent of Saint Lucia’s 2015 gross domestic product (GDP) – to address its contingent liabilities related to floods and hurricanes¹ (Table 1). This amount is equivalent to 3.76 percent of the GoSL’s total expenditure for 2015.² Hurricane damage to public and private building infrastructure alone will amount to USD 12.07 million (EC\$ 32.59 million) on average each year over the long run.³ For any given year, Saint Lucia has about a 1 percent chance of total losses from hurricanes exceeding USD 882 million (EC\$ 2,381 million). In addition to long-term impacts on economic and social development in Saint Lucia, disasters also increase the country’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 (Hurricanes)	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)	9.5	49	33	16
10	10.7	71	51	31
50	134.2	520	355	173
100	228.0	882	608	265
250	377.3	1,347	929	380

Source: Authors’ analysis.

Saint Lucia can adjust its approach to disaster financing to be more timely and cost-effective and to minimize opportunity costs. Following a disaster, the GoSL typically reallocates 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 advances, which are not necessarily designed for the type of exigency that a natural disaster creates. Financing for long-term reconstruction takes the form of international assistance and loans secured on an *ad hoc* basis after disaster strikes, further limiting fiscal space and exacerbating public debt.

Existing instruments for DRF are not optimized to address Saint Lucia’s disaster risk profile, prone to both high- and low-frequency natural hazards. While Saint Lucia’s Disaster Risk Management (DRM) Policy Framework states that the government will maintain an Emergency Disaster Fund (EDF) to provide relief after the impact of a disaster, in practice it does not exist.⁴ Similarly, Section 81 of the Constitution dictates that it is parliament’s responsibility to create a Contingency Fund for anything the Minister of Finance believes to be an urgent and unforeseen expenditure; however, funds are not earmarked for disasters alone. Saint Lucia is also a member of the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and pays an annual premium of USD 2.42 million (EC\$ 6.53 million).⁵ The GoSL can also access up to USD 1 million (EC\$ 3 million) immediately after the declaration of a state of emergency as part of the

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, Saint Lucia 2016.

⁴ Questionnaire response from MoF, Budget Office, February 2016.

⁵ 2016-2017 coverage, including windstorm, earthquake, and excess rainfall coverage.

Contingent Emergency Response Component (CERC) of the World Bank’s Disaster Vulnerability Reduction Project (DVRP) in Saint Lucia.⁶ Parametric catastrophe insurance like CCRIF is well suited for coverage of severe events, but Saint Lucia is lacking access to financing for low- and medium-severity events, most effectively provided through reserve funds and flexible *ex ante* contingent financing arrangements.

This report presents recommendations for a cost-effective natural DRF strategy in Saint Lucia, drawing heavily on international experience, country-specific information, and similar conditions in highly indebted indebted small island developing states (SIDS). The study discusses a series of complementary recommendations for a national DRF strategy, based on a preliminary fiscal risk analysis and a review of the current budget management of natural disasters in Saint Lucia. It benefits from the international experience of the World Bank and the approach outlined in its operational disaster risk financing and insurance framework,⁷ which has been used in several countries (Belize, Colombia, Fiji, Grenada, Jamaica, Indonesia, Mexico, Pakistan, the Philippines, Samoa, Sri Lanka, Solomon Islands, Tonga, Vanuatu, and Vietnam) to assist with the design and implementation of sovereign catastrophe risk financing strategies (Annex 1). This exercise is tailored to the institutional, social, and economic characteristics of Saint Lucia.

Current public financial management (PFM) practices do not facilitate rapid disbursement of existing funds for disaster response or allow for easy tracking of disaster expenditures. While Saint Lucia’s National Consolidated Fund supports recurrent costs for the National Emergency Management Organization (NEMO), which allows NEMO to maintain an imprest account of USD 100,000 (EC\$ 270,000) in the event of a disaster,⁸ there is no direct budget appropriation mechanism for explicit immediate disaster response. The MoF reallocates funds from its contingency vote or reprioritizes its capital program to accommodate for the immediate needs.⁹ An additional allocation can be made from the consolidated fund for the initial response to any declared disaster, based on the magnitude of impact and the scale of the response.¹⁰ This reallocation is accounted for outside of the regular budget cycle through advances, which are not necessarily designed for the type of exigency that a natural disaster creates and which are not reconciled later through a supplementary budget.

This study presents options for a combination of new, existing, and refurbished risk retention and risk transfer instruments that could help the GoSL increase its immediate financial response capacity against natural disasters and better protect its fiscal balance. The disaster risk financing tools and approaches that Saint Lucia has accessed in the past or have available to access through existing policy actions are listed below in Table 2. Some are the result of *ex ante* planning, and some materialize after a disaster. Building on the three-tier risk layering approach for low-, medium-, and high-frequency events promoted by the World Bank; fiscal constraints of the GoSL; the existing legislative environment; the capacity of the insurance sector of Saint Lucia; and a cost-benefit analysis tailored to Saint Lucia’s natural disaster risk profile, Figure 2 below represents the recommended organization of instruments for a comprehensive risk financing strategy. Table 3 further elaborates on recommended instruments and policy actions.

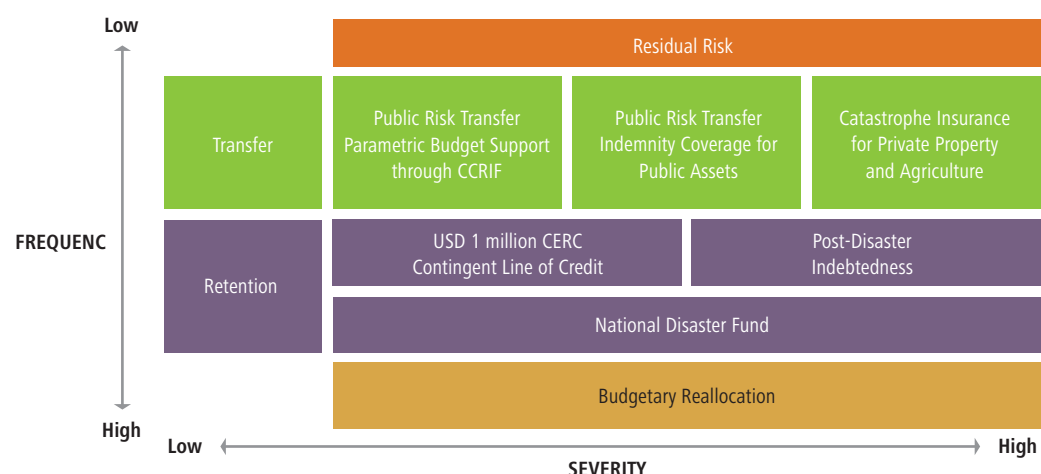
Table 2: Existing Instruments and Approaches for Disaster Risk Financing in Saint Lucia

Ex Ante	Retention	Budgetary Reallocation through Consolidated Fund
		Emergency Disaster Fund/Contingency Fund
	Transfer	CCRIF Insurance of Public Assets
		Livelihood Protection Policy (LPP) Windward Islands Crop Insurance Ltd (WINCROP)/Winfresh Property Insurance
Ex Post	Retention	Grants and External Concessional Financing Contingent Emergency Response Components of DVRP

Source: Author’s analysis

6 It is worth noting, however, that CERC is only a temporary instrument until the end of DVRP.
7 Financial Protection against Natural Disasters: From Products to Comprehensive Strategies, An Operational Framework for Disaster Risk Financing and Insurance. 2014. World Bank Group
8 Government of Saint Lucia Estimates of Expenditures 2014–15.
9 Questionnaire response from Deputy Chief Economist, Department of Planning and National Development, February 2016.
10 Saint Lucia National Progress Report on the Implementation of the Hyogo Framework for Action, 2009–2011.

Figure 1: Illustrative Strategy for Proposed DRF Options



Source: Authors' analysis.

Table 3: Strategy Recommendations for DRF in Saint Lucia

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 reconstruction expenditures.
	a. Make additional revisions to the Chart of Accounts (CoA) to have specific Detailed Object Codes (DOCs) for both disaster-related recurrent and capital expenditures and disaster-risk insurance. The designation of an activity code for Disaster Management in the Revised CoA should be consistent with the level of detail GoSL proposes.
	b. Provide NEMO with capacity building and institutional strengthening to prepare it to take on greater accountability in loss assessments and relief expenditures.
Short/Medium Term	3. Complete an inventory of public assets.*
	a. Integrate explicit contingent liabilities in budgetary planning process.
	b. Review the present definition of contingent liabilities, recognizing the difference between implicit and explicit contingent liabilities in law, with consideration of its application to natural disaster scenarios.
Short Term	4. Approve a DRF strategy.
	a. Include the accounting of contingent liabilities bases on International Public Sector Accounting Standards in a comprehensive disaster financing policy approved by the Cabinet.
	b. Publish annual debt management strategy.
	c. 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 to the government.
	5. Operationalize EDF and increase contingency reserves for public contingent liabilities associated with events with a 5-year return period.
	a. Establish safeguards to ensure that there are appropriate funds earmarked for disaster financing, including provisions to incentivize compliance.
	b. Amend the Financial Administration Act to include a specific provision in law on the amount or ratio to be allocated annually in an interest-bearing fund for disaster financing.
	c. Strengthen the compliance on the use of the EDF to respond to short-term disaster needs as opposed to advances.
	6. Establish a contingent line of credit, to finance public contingent liabilities associated with events of a 10-year return period.
	a. Undertake an analysis of capital budget disaster financing to evaluate the cost-effectiveness of the various recovery and reconstruction projects funded by loan.
	b. Shift away from bond borrowing to lower-cost loans offered by international development partners to reduce capital expenditure used for disaster risk financing.
Medium Term	7. Establish a robust catastrophe risk insurance program for public assets and parastatals.
	8. Enhance management of contingent liability related to social protection.
Private Insurance Market	
Medium Term	9. Enhance availability, penetration, and affordability of private and residential catastrophe insurance. Evaluate potential for public-private partnerships (PPPs) for housing subsidies.
	10. Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for smallholder farmers.

* This process has commenced, but it is not complete.

The above recommendations would allow the GoSL 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 fiscal analysis discussed in Chapter 3). The combination of reserves, emergency financing from a contingent line of credit, parametric insurance, and indemnity insurance offers a cost-effective strategy. 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) 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.

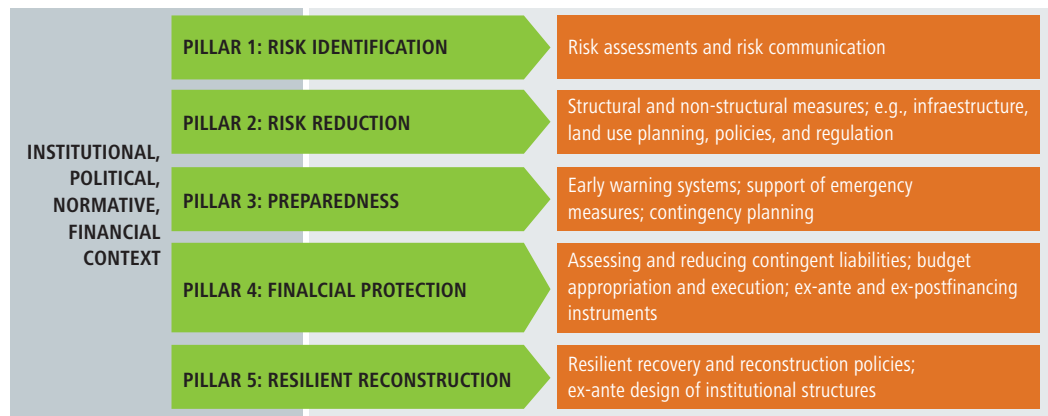
The GoSL could support the establishment of a disaster risk insurance program for key public assets in partnership with the private insurance industry. Most of the public assets, including critical assets such as hospitals and schools, are not currently insured against natural disasters. This program would aim to offer technical assistance to 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.

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 2015–2030¹¹ and is part of the Strategic Framework for Comprehensive Risk Management of Disasters developed by the World Bank.¹² This report defines the five pillars of a 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 in 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.

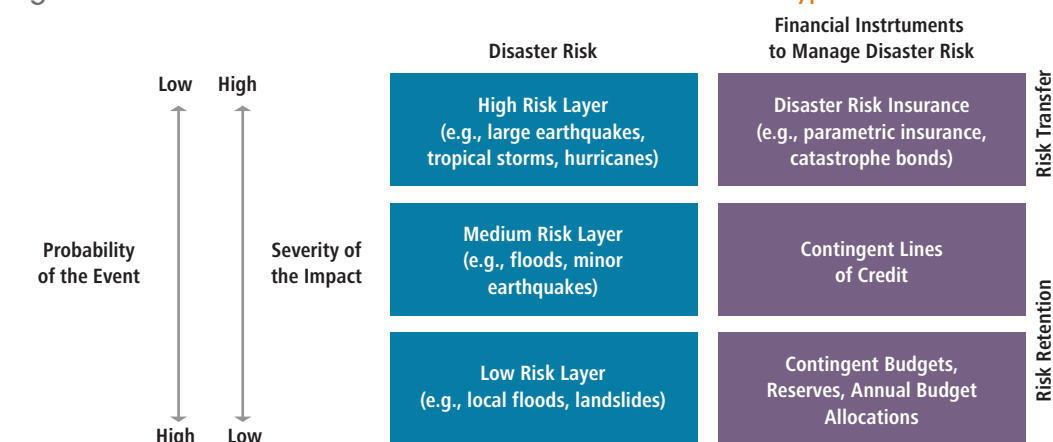
It is important to note that the Disaster Risk Finance Technical Assistance (DRFTA) Project on which this report is based focuses solely on the financial protection pillar. However, it does not lessen the need to strengthen the other dimensions of integrated risk management, including the preparedness component that is crucial for Saint Lucia. The DRFTA Project is part of the broader partnership with the GoSL on DRM and climate change adaptation. Saint Lucia is currently implementing a World Bank-funded DVRP (P127226), which aims to reduce physical 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 GoSL prior to the disaster and the *ex post* measures operationalized after a disaster.

¹¹ 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).

¹² 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.pdf>

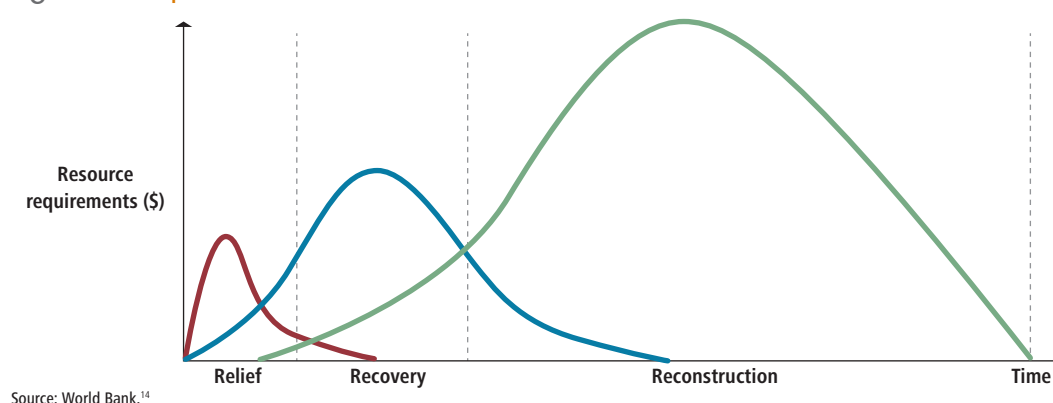
Figure 3: Most Cost-Effective Financial Instruments for Different Types of Risk



Source: World Bank.¹³

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.¹⁴

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 GoSL'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 gives rise to 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.¹⁵ To specifically address the needs of the GoSL related to natural disasters, this approach focuses on three activities: quantifying the contingent liabilities of the GoSL to estimate the fiscal risk of natural disasters, reviewing the current public financial management of natural disasters in Saint Lucia 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.

¹³ Ghesquiere, F. and Mahul, O. 2010. Financial Protection of the State against Natural Disasters: A Primer. Washington, DC: World Bank.

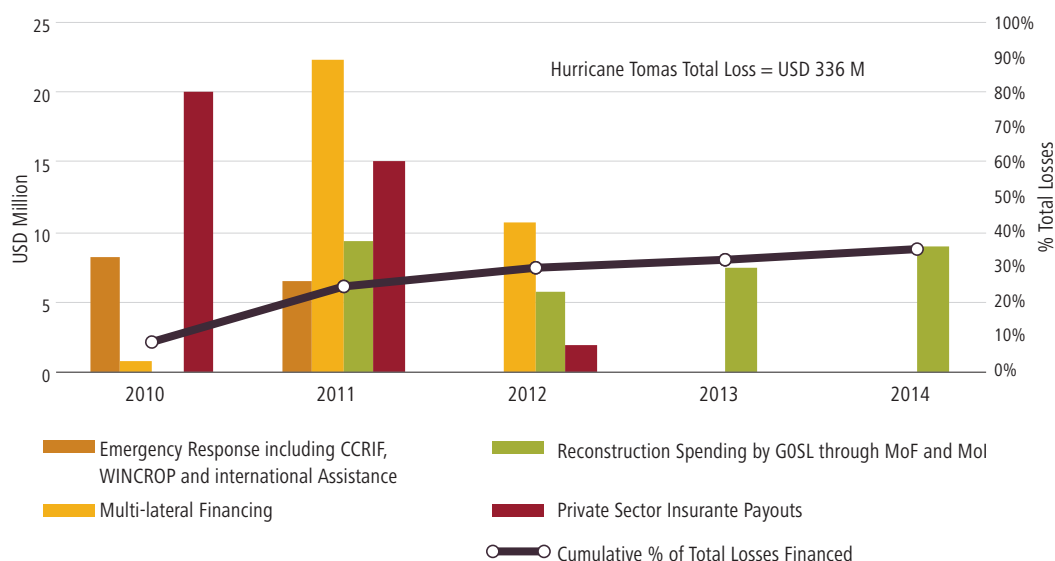
¹⁴ Ibid.

¹⁵ Financial Protection against Natural Disasters: From Products to Comprehensive Strategies, An Operational Framework for Disaster Risk Financing and Insurance. 2014.

Brief Introduction of the Case for a DRF Strategy in Saint Lucia

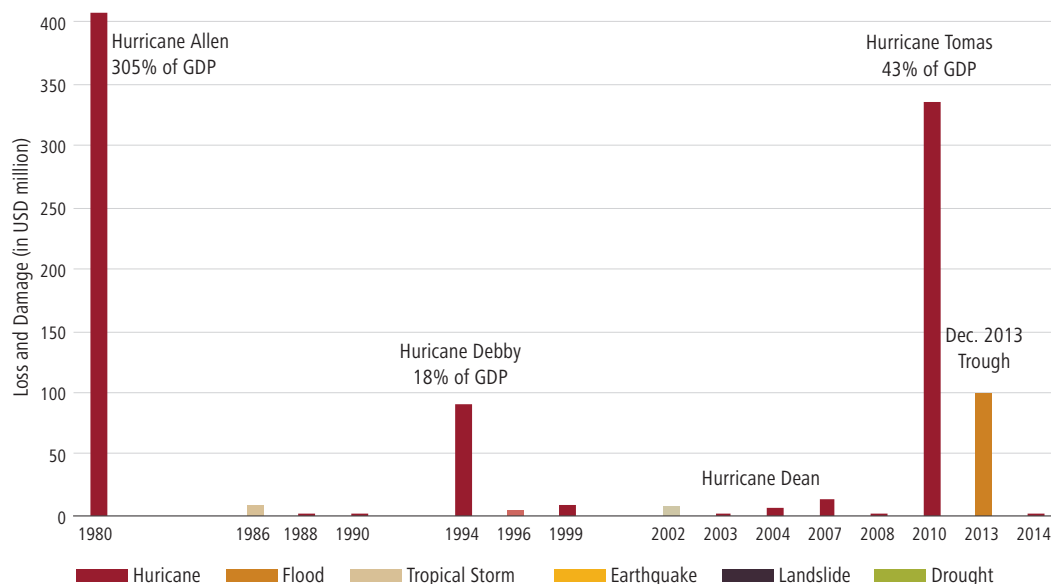
Bilateral and multilateral aid flows are not sufficient to support Saint Lucia in disaster recovery and reconstruction efforts. Saint Lucia has received only about USD 70 million (EC\$ 189 million) in grants and loans to support DRM and emergency response since 1990.¹⁶ Figure 5 shows aid flows after Hurricane Tomas, for example, that left a 65 percent funding gap between total losses and public and private expenditures. More recently, after the December 2013 flood event, the GoSL and the World Bank estimated a reconstruction funding gap of USD 83 million (EC\$ 224 million).¹⁷

Figure 5: Hurricane Tomas, 2010 Distribution of Response and Reconstruction Financing and Expenditures



Source: GoSL Estimates of Revenues and Expenditures 2010/11, 2011/12, 2013/14, 2014/15, AidData, IICA, Axco.

Figure 6: Losses from Major Natural Disasters in Saint Lucia (USD million)



Source: Authors, based on Desinventar, Caribbean Disaster Emergency Management Agency, World Bank.

¹⁶ AidData Beta. 2015. Open Data for International Development.

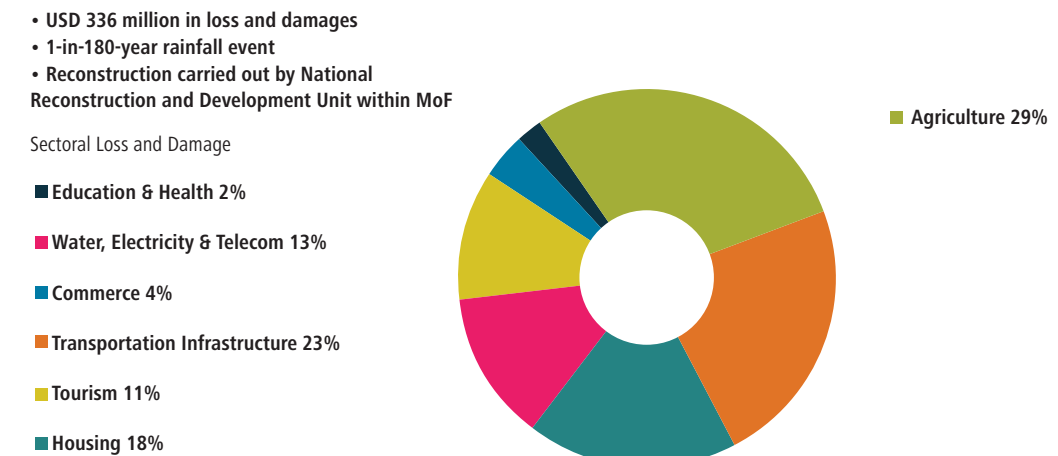
¹⁷ GoSL and World Bank. 2014. "Saint Lucia Flood Event of December 24–25, 2013."

Saint Lucia 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. As indicated in Figure 6, between 1980 and 2014, several different hurricanes made landfall in Saint Lucia causing significant physical and financial damages. In addition, intense rainfalls have caused flooding, for example, when, in December 2013, 353 mm of rain fell in 24 hours. The Intergovernmental Panel on Climate Change (IPCC) has high confidence that the effects of climate change will intensify.¹⁸ Impacts from natural disasters will therefore most likely become even greater, commensurate with growth in Saint Lucia’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 island economies like Saint Lucia’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.¹⁹

The quantification of fiscal risks linked to natural disasters is the first step in devising a cost-effective DRF strategy. Saint Lucia’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.²⁰ According to the CDRP, hurricanes cause an average annual loss (AAL) of USD 9.5 million (EC\$ 25.7 million) and earthquakes cause USD 2.56 million (EC\$ 6.91 million) in losses, or 0.66 percent and 0.18 percent of GDP, respectively. Moreover, there is a 0.4 percent chance each year of losses exceeding USD 377 million (EC\$ 1,018 million) due to hurricanes or USD 147 million (EC\$ 397 million) due to earthquakes. Single-family, wood-frame walls with plywood sheathing buildings, as well as reinforced masonry buildings with concrete diaphragms, are most vulnerable to hurricanes, accounting for 52 percent and 38 percent of AAL, respectively.

This study further validates the above estimates and takes the first steps in quantifying the GoSL’s explicit contingent liabilities by analyzing the financial and sector losses, as well as the amounts allocated and spent by the government for relief, recovery, and reconstruction (Figure 7).²¹ The exercise considered natural disasters between 1980 and 2015, including events that were less severe than the major disasters referenced above. AAL, including indirect and direct losses for both the public and private sectors, is estimated at USD 48.5 million (EC\$ 131.0 million), equivalent to 3.39 percent of national GDP, and AAL for the GoSL’s contingent liabilities alone came to around USD 16 million (EC\$ 43 million).

Figure 7: Hurricane Tomas 2010.



Source: Economic Commission for Latin America and the Caribbean.

18 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.

19 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.

20 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 GoSL, or rather, the GoSL’s contingent liabilities in building stock. The actuarial analysis of historical disasters in Saint Lucia, 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 GoSL’s contingent liabilities, and also capture a portion of the GoSL’s implicit contingent liability through, for example, applying the knowledge that historically the GoSL has made ad hoc financial responses to the housing sector.

21 A consultant with the World Bank DRFTA Project worked with the MoF and NEMO for data collection in 2015.

Damages from Hurricane Tomas on the road network, utilities, and agriculture were severe and caused negative spillovers into other sectors.²² In fiscal year 2011/12, the revenue impact of Hurricane Tomas was estimated at about 0.05 percent of GDP, and additional spending for reconstruction was estimated at 3 percent of GDP. Ultimately, because of policy challenges in addressing the impact, including Eastern Caribbean Currency Union (ECCU)-related monetary policy constraints, limited fiscal space due to high levels of debt, and capacity limitations to scale up public investment, authorities limited reconstruction financing to grants and external concessional financing.²³

Fiscal space is shrinking in Saint Lucia and the public debt trajectory is vulnerable to various shocks. After an average GDP growth of 4.5 percent between 2003 and 2006, Saint Lucia was hit by multiple exogenous shocks, including hurricanes, the global financial crisis, and weak tourism demand. Average GDP growth slowed to 0.25 percent between 2007 and 2013. Additionally, from 2009 to 2015, the public debt-to-GDP ratio grew from 56.28 percent to 86.97 percent.²⁴

The bulk of post-disaster, recovery, and reconstruction costs have been borne by loan financing, with a small portion coming from grants and government revenues. The largest contributor has been the use of bonds on the capital market (38.6%), followed by the Caribbean Development Bank (22.8%), the World Bank/International Development Association (IDA) (20.1%), the World Bank/International Bank for Reconstruction and Development (IBRD) (6.5%), and government revenue (4.1%).²⁵ While the GoSL has benefitted from the responsiveness of the external community to natural disasters, relying on capital expenditure for disaster risk financing is another contributing factor to the country's skyrocketing debt-to-GDP ratio in recent years.

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 Saint Lucia, 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.

²² Saint Lucia Request for Disbursement under the Rapid Credit Facility and Emergency Natural Disaster Assistance. 2011. Staff Report, Staff Supplement, Press Release, and Statement by the Executive Director for Saint Lucia. IMF Country Report 11/178.

²³ Ibid.

²⁴ World Bank Country Profile.

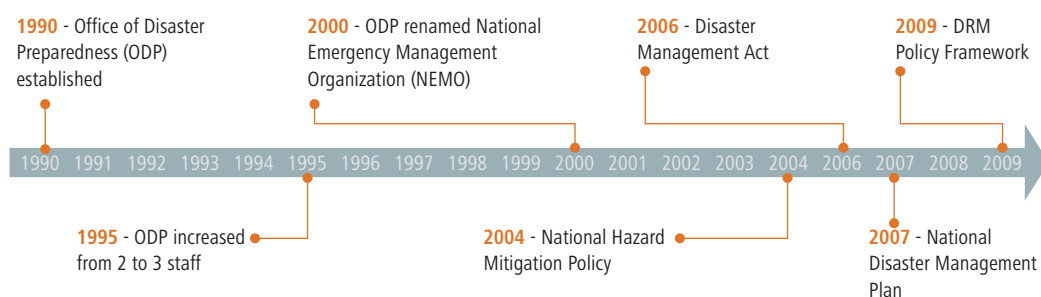
²⁵ Authors' calculations using Estimates of Revenue and Expenditure for fiscal years 2004–2014.

Chapter 2

Chapter 2. Public Financial Management of Disaster Risk

The Legal and Regulatory Framework²⁶

Saint Lucia introduced the National Hazard Mitigation Policy in 2004 and passed the Disaster Management Act in 2006, codifying the responsibilities of NEMO. The 2007 National Disaster Management Plan guides risk assessment, prevention, and post-disaster response activities. Together, these policies represent a shift from a reactionary to a more proactive DRM framework, which is spelled out in the 2009 DRM Policy Framework. This framework includes the use of financial instruments to safeguard against fiscal shocks associated with disasters and stated that financial resources will be allocated for disaster management from both the capital and recurrent budgets subject to the administrative procedures necessary to ensure the integrity of the budgetary allocation process.



The Disaster Management Act is the essential operational statute for disaster management in Saint Lucia. Under the Act, post-disaster responses are separated into three time-bound categories: emergency response/relief, recovery, and reconstruction. Emergency response and relief takes place immediately after the disaster, while recovery can last from 3 to 6 months. The post-event activities that take place after the first 6 months of the event are, typically, reconstruction and are longer-term rehabilitative activities.

According to Saint Lucia's National Disaster Management Plan, NEMO is responsible for disaster coordination, including planning, mitigation, and response functions at the national level and through 18 district-level Damage Assessment and Needs Analysis (DANA) teams. The National Hazard Mitigation Policy is designed to be translated into subnational development processes, as the 18 district teams report to the NEMO Secretariat to coordinate local response and assess damages. These local DANA teams feed a national DANA team to report on risk reduction before and assess damages after a disaster. The prime minister directs NEMO through his or her role as chairperson of the National Emergency Management Advisory Committee, which is composed of various ministries and heads of the police, the fire department, the Red Cross, the port authority, and other related agencies.

The DRM Policy Framework is the first attempt by Saint Lucia to formalize an approach to DRF. According to this framework, financial management of disasters will be guided by the following principles:

- 1. Encourage all levels of government to take measures to minimize the impact and reduce the likelihood of disasters.** Where feasible, incentives should be provided for the taking of such measures.

²⁶ The World Bank acknowledges this is not a full legal review, which was beyond the scope of this technical assistance. However, this report does 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 GoSL as the legal backing to its actions in times of disaster related to finance.

2. **Meet clearly stated objectives of any disaster management strategy or plan in a timely and efficient manner that is consistent with the financial policies of government.**
3. **Encourage response to disasters at the most localized level of responsibility possible.** Government should provide additional funding only when other capacity and resources have been exhausted or are absent.

The Financial Administration Act

PFM in Saint Lucia is mainly determined by the Constitution and the Finance Administration Act (FAA) of 2005. These documents provide the primary guidance for the operation of the Consolidated Fund and the Contingency Fund, and they also prescribe other parameters for operating in times of emergency. The existing legal and constitutional framework for PFM provides scope for DRF as a component of budgeting, specifically as it relates to compliance with the law to ensure that expenditures can be both tracked and evaluated.

The current FAA has some limitations in that it does not differentiate between an implicit and an explicit contingent liability. Explicit contingent liabilities are legal or contractual financial arrangements that give rise to conditional requirements to make payments of economic value. Payments are effected when one or more conditions is satisfied or occurs. Implicit contingent liabilities do not arise from a legal or contractual source, but are recognized after a condition or event is realized. These two definitions are simpler and could assist in articulating the difference between the two types of contingent liabilities, in law, especially given the intent to design DRF instruments that would create contractual and legal obligations on the part of the government and the underwriter.

The Contingency Fund

Section 81 of the Constitution dictates the responsibility of parliament to create a Contingency Fund for anything the Minister of Finance believes to be an urgent and unforeseen expenditure for which no other provision exists. In these circumstances, a supplementary estimate and bill must be approved by the House of Assembly as soon as possible for the purpose of replacing the amount advanced.²⁷ Section 11 of the FAA establishes the Contingency Fund, which is seeded by a transfer from the Consolidated Fund. However, there are no specific guidelines on annual allocations to the contingency fund—the amount is determined based on availability of funds—and it is unclear if any part of the fund is invested.

The MoF, through the Accountant General, manages the Contingency Fund. The balance of the Contingency Fund as of September 30, 2016, was USD 314,842 (EC\$ 850,073). Since its establishment in 1997, the Contingency Fund has been used for only one event: a prison fire in that same year that used up approximately 43 percent of the funds. Since that time, the only drawdown on the fund has been bank charges, amounting to an additional 0.07 percent over 17 years, for annual charges of USD 22.2 (EC\$ 59.9) per annum, and another 0.003 percent for bank charges. The remainder on the fund is USD 314,842 (EC\$ 850,073) (56.7 percent of original capitalization of USD 550,000 [EC\$ 1.5 million]).²⁸

The Emergency Disaster Fund

Saint Lucia's DRM Policy Framework states that the government will maintain an EDF to provide relief after the impact of a disaster. Section 9.5.1 of the Policy Framework instructs the EDF to be guided by certain principles, including a government-wide policy of impact minimization and mitigation and fiscal prudence.²⁹ The EDF was designed, in principle, to be rule-based: "[T]he decision to release funds should be guided by established criteria and guidelines. To prevent the fund from being used for recurring or foreseeable disasters in the same areas, a post disaster review should automatically be conducted whenever funds are drawn from the fund."³⁰ In other words, the EDF should be used only for unforeseeable, non-recurrent disasters. While the fund has been enacted into law, in reality it is not operational.³¹

The Imprest Account of NEMO

Codified by the 2006 Disaster Management Act, NEMO has a number of responsibilities related to disaster preparedness and emergency management and is charged with short-term relief. To support its operations, NEMO receives funding from the Accountant General through an imprest account, funded from

²⁷ Questionnaire response from Department of Finance, Budget Office, February 2016.

²⁸ Government of Saint Lucia Estimates of Expenditures 2004–14.

²⁹ Government of Saint Lucia. 2009. Disaster Management Policy Framework.

³⁰ Ibid.

³¹ Questionnaire response from Deputy Chief Economist, Department of Planning and National Development, February 2016.

the National Consolidated Fund.³² Since 2010, based on available budget documents, an estimated 0.04 percent (roughly USD 240,000 [EC\$ 648,000]) of the national budget (including recurrent and capital expenditures) is allocated to NEMO to be used for capital, recurrent, and response expenditures. An additional allocation can be made from the Consolidated Fund for the initial response to any declared disaster. This allocation is augmented based on the magnitude of impact and the scale of the response.

The Budgetary Framework for Post-Disaster Finance

During fiscal years 2004–2014, the Estimates of Expenditure has accounted for USD 146.95 million (EC\$ 396.77 million) in post-disaster response finance, which is 25.04 percent of total losses from natural disasters during the same period. Table 4 shows the aggregate and components of the government's expenditure versus Desinventar estimates of financial loss.

In addition, rather than utilizing reserve financing through the EDF or the Contingency Fund for immediate post-disaster expenditures, the GoSL has, where necessary, reallocated 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 advances, which are not necessarily designed for the type of exigency that a natural disaster creates and which are not reconciled later through a supplementary budget.

Table 4: Total GoSL Post-Disaster Finance Relative to Total Financial Loss

Total Government Post-Disaster Relief, Response, and Reconstruction Expenditures (USD million)						
Fiscal Year	Estimates of Expenditure			Nemo Imprest Account	Total Response (Capital, Advances, and NEMO)	Estimates of Financial Loss by Year of Event
	Recurrent	Capital	Advances			
2004/05	0.12	7.90	—	—	7.90	6.33
2005/06	0.13	10.88	—	—	10.88	—
2006/07	0.16	7.58	—	—	7.58	—
2007/08	0.19	12.82	—	0.14	12.96	20.31
2008/09	0.18	10.57	0.90	0.07	11.54	93.89
2009/10	0.17	9.36	—	—	9.36	—
2010/11	0.18	10.30	—	—	10.30	333.60
2011/12	0.21	24.10	6.98	—	31.08	16.97
2012/13	0.25	15.15	2.25	—	17.40	16.42
2013/14	0.25	13.42	0.58	—	14.00	98.47
2014/15	0.23	13.98	—	(0.03)	13.95	0.74
Total	2.07	136.06	10.71	0.18	146.95	586.73
% of total loss	0.35%	23.22%	1.82%	0.03%	25.04%	

Source: Authors' calculations using Estimates of Revenue and Expenditure for Fiscal Years 2004–2014, advances for fiscal years 2004–2014 provided by the Accountant General's Department, Imprest Account Activities provided by NEMO, and data collected by Laurah John on Saint Lucia's Disaster and Loss Expenditure.

The recurrent allocation to NEMO, which averaged USD 190,000 (EC\$ 513,000) annually primarily covers NEMO's operating expenses. A review of the budget has not revealed recurrent expenditure as a response to a natural event because there is no extra-budgetary reconciliation to pinpoint where the recurrent budget has been adjusted to accommodate disaster financing due to the use of advances.

The review of the fiscal accounts over the 10-year review period suggests that more than 91 percent of post-disaster financing is accounted for as capital expenditure—whether loans from the international development community or bonds placed on the international capital market. In the years where there was no event but capital expenditure, for example, fiscal years 2006/06, 2006/07, and 2009/10, this

³² Information was requested on how the fund operates but all that was provided was the Terms of Reference. It is not known to what extent the fund is capitalized. It is also not known if the Auditor General has ever audited the fund.

reflects ongoing reconstruction programs. However, the Estimates of Revenue and Expenditure may not have accounted for all public spending in this area due to coding of expenditure and reconciliation of extra-budgetary financing during the financial year of occurrence.³³ The absence of intra-year budgetary reconciliation through Supplementary Estimates limits knowledge of the full extent of spending for relief and recovery.

Limitations of Existing PFM for DRF

The PFM assessment reveals a number of concerns and challenges for the development of appropriate DRF instruments, particularly for short-term relief expenditures. The law does not identify the direct contingent liabilities of the government, nor does it dictate the appropriate channels for post-disaster relief, recovery, and reconstruction financing. Such guidelines would specify when the expenditure should be approved, by whom, and through which particular accounts, with the appropriate ceilings as well as the reconciliation process. Audit reports on these accounts are not readily available in the public domain.

The 2015 “Pre-PEFA” report issued by the Public Expenditure and Financial Accountability (PEFA) Program, prepared by the Caribbean Regional Technical Assistance Center and designed as a precursor to an official PEFA assessment, assessed the GoSL’s extent of reporting on extra-budgetary operations with a grade of D.³⁴ The budget documentation does not include the advances that are used, inter alia, to offset disaster financing. No Supplementary Estimates have been approved during this period, indicating a gap in operational procedure for extra-budgetary regularization. This suggests an understatement of the budget, as there may not be a true or full account of public expenditure. However, though the law states explicitly that the Supplementary Estimates should be used to regularize intra-year budgetary deviations, including advances, imprests, and the Contingency Fund,³⁵ it should be a last resort. Regular use is not consistent with international best practice. However, given that the law facilitates it, PFM efforts should focus on eventually creating sufficient fiscal discipline to prevent the need for its use. In the interim, the Supplementary Estimates should be used as prescribed by law.

The Contingency Fund is not being utilized to finance natural disaster-related expenditures, nor is it being replenished. The fund’s responsiveness has, therefore, not been tested. Use of the fund would have provided valuable records from its ledgers to identify expenditure by year, amount, and purpose, and to associate these key pieces of data with a particular natural event. The use of advances is neither illegal nor wrong. What is problematic is using advances as opposed to the Contingency Fund or EDF, which is for unforeseen expenditure.

NEMO has no dedicated fund for short-term relief, and it is not clear how the EDF will be administered. With regard to the imprest account, there is a need for improved tracking of expenditures. Based on the information provided, NEMO provides only very short term relief services. The fiscal management and accounting for the resources is a concern, based on the statements provided, as the information was not always consistent. There is much room for improvement, including greater accountability to the Accountant General. In one year, in particular, there was a breakdown in accounting practices, as the balance as of March 31, 2008 was carried forward to April 30, 2008, instead of being closed off or reconciled fully. Based on the law, imprest account balances should be returned to the treasury and the new accounting period start afresh.

Similarly, the practice of international development partners directly making payments for invoices in NEMO’s possession makes it difficult to capture the full extent of the expenditure for disaster financing. All such expenditures should go through the Consolidated Fund and should be reflected as a credit to the Consolidated Fund and debit to NEMO’s imprest account.

The Chart of Accounts

The 2015 Pre-PEFA report assessed the GoSL’s classification of the Budget with a grade of D. This grade was received because the classification system used for formulating, executing, and reporting on the central government’s budget is not consistent with international standards. This system is evidenced by the fiscal year 2015/16 tabled estimates and the fiscal year 2014/15 in-year budget execution report, which reflect the Chart of Accounts (CoA) modality used in the SmartStream accounting system. The report showed administrative, program, and economic segments but no functional segments for tracking

³³ Recovery assumes that the event would have occurred no earlier than October of the previous fiscal year since recovery is estimated to be up to 6 months after the event.

³⁴ This document was provided by the GoSL with the explicit understanding that it was only for the purpose of informing this PFM assessment of disaster risk-financing in Saint Lucia. Prior to this assessment, a full PEFA assessment was conducted in 2009. The next full PEFA took place in 2017.

³⁵ Financial Administration Act, Part 5, Section 21 – Supplementary Appropriation.

budgetary execution. This is consistent with the finding regarding disaster financing expenditure, but even more pronounced as there is no consistent activity for Disaster Management throughout the central government budget. The assignment of a Disaster Management activity code is *ad hoc* and limited to a few strategic ministries.

The GoSL has had a CoA Manual since September 2014, and the intent was to implement this manual in fiscal year 2015/16. Based on the revised CoA, it is at the activity/project level under the head segment that disaster-related financing would be captured. Insurance payments, for example, would be captured under Standard Object Code (SOC) 172 (Detailed Object Code [DOC] 0172001 for Insurance Building³⁶). It would be good to have account descriptions that are specific to Disaster Management and Disaster Response.

Under the SOC, there is a proposed code 181 for Contingency Current Expenditure.³⁷ The manual states: “This is a provision made under certain reserve account to deal with emergency expenditure increases and may only be coded by the Ministry of Finance.”³⁸ If this Contingency Current Expenditure becomes a reality and is advanced from the Contingency Fund, it would be a mechanism to ensure that the exigency of the situation post-disaster is addressed forthwith. It is not clear, however, why there is a proposed Contingency Current Expenditure and another SOC (740) for Contingency Fund³⁹ (DOC 0740000/1) or if the two will operate in tandem as proposed.

The revised CoA will have a SOC for Grants from Foreign Governments (331), Grants from International Organizations, for example. This, along with the activity/project, would determine if the expenditure is from disaster financing and where the grant comes from.

The practice of poor classification and improper accounting, reporting, and reconciliation, including not using the Contingency Fund, results in an untenable situation where disaster-related financing for relief, and to a lesser extent recovery, cannot be credibly accounted for. The CoA can become the main tool for tracking budget execution of resources—whether loans, grants, or government revenue—for disaster financing both in the Annual Estimates of Revenue and Expenditure. Just as with any changes, the Budget Call that goes out at the first instance of implementing the revised CoA would provide these detailed instructions on how to capture each particular expenditure.

³⁶ Under the current CoA, the SOC is 137 and the DOC is 0137002.

³⁷ This account description does not exist under the current CoA.

³⁸ GoSL. 2014. Accountant General's Department CoA Manual (Object classifier) Draft.

³⁹ There is no listed old object for the Contingency Fund.

Chapter 3

Chapter 3. Fiscal Disaster Risk Assessment

This chapter applies probabilistic modeling techniques in an attempt to quantify public sector contingent liabilities. Saint Lucia has experienced substantial gaps between estimated losses and actual expenditures--hindering economic and social development. Quantifying public sector contingent liabilities is paramount and allows for improved planning for natural disaster losses. The fiscal disaster risk profile of Saint Lucia, reflecting the government's contingent liability from natural disasters, should be built on both historical recorded disaster losses and simulated, or probabilistic, losses. Probabilistic catastrophe risk models offer the government 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.

An initial assessment of the GoSL's contingent liability to disasters indicates that the government faces a major financing challenge arising from natural catastrophes. Storms, hurricanes, and floods are a major driver of risk, causing an estimated total annual economic loss of USD 48.5 million (EC\$ 131.0 million), equivalent to 3.39 percent of national GDP.⁴⁰ However, simulations show that a major hurricane event with a return period of 100 years could cause losses in excess of USD 881.5 million (EC\$ 2,380.1 million), which equates to around 61.59 percent of national GDP.⁴¹

Fiscal Disaster Risk Modeling

The CDRP, developed by the World Bank in 2015, presents country- and department-level probabilistic disaster risk profiles to provide risk assessments and estimates of potential damage to buildings caused by hurricanes⁴² and earthquakes.⁴³ Traditionally, sophisticated global building inventory exposure models for use in natural hazard risk assessment are held within the private sector, usually the reinsurance industry and catastrophe risk modeling agencies; 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 Saint Lucia, such as geographical location, urban/rural classification, type of occupancy, building materials (e.g., wood, concrete), and the replacement value. The total modeled replacement value of the building stock in Saint Lucia is USD 2.99 billion (EC\$ 8.07 billion) (2015 values)⁴⁴ 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 (EP) curves that represent the likelihood that a specific economic loss will be exceeded. This was done for both earthquakes and hurricanes using building exposure.

Combining exposure with hazard and vulnerability functions indicates that the AAL to the building stock due to earthquake risks is approximately USD 2.56 million (EC\$ 6.91 million) at a national level, or 0.18 percent of GDP. Additionally, once every 250 years, these losses are expected to exceed USD 147.8 million (EC\$ 399.1 million), or 10.33 percent of GDP. The loss exceedance curve shows the potential earthquake losses for key return periods. Aggregated results at a province level underscore that Castries province

⁴⁰ Based on authors' calculations in the World Bank CDRP.

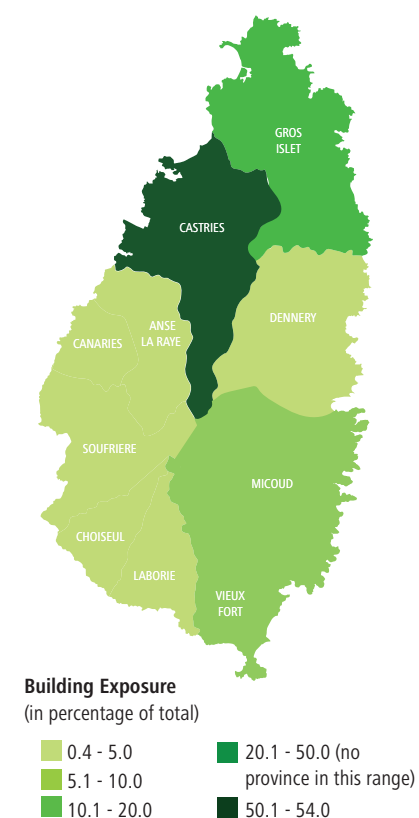
⁴¹ USD and GDP figures are in 2015 values.

⁴² The losses associated with hurricanes account for wind damage only, not damage from flooding or storm surge.

⁴³ 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.

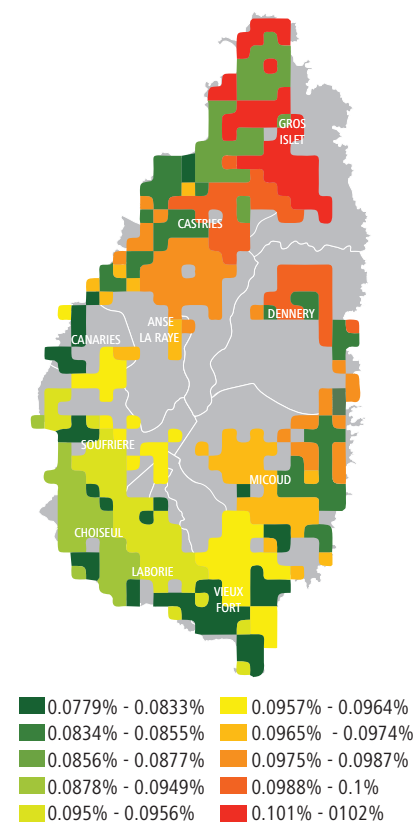
⁴⁴ Gunasekera, Rashmin et al. 2015. Developing an Adaptive Global Exposure Model to Support the Generation of Country Disaster Risk Profiles.

Figure 8: Building Exposure Aggregated by Province



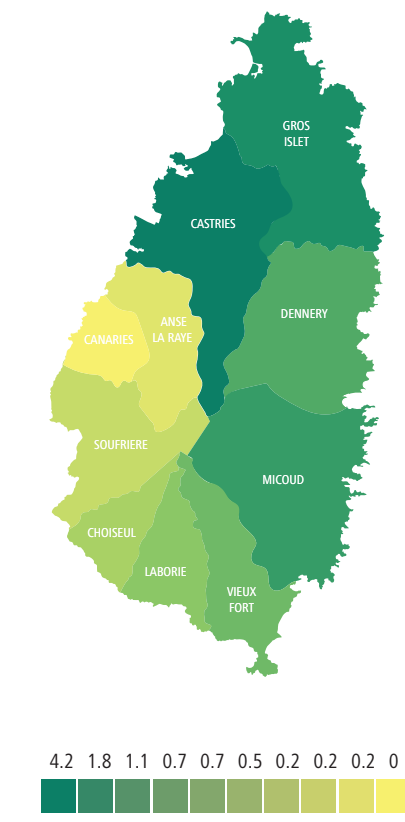
Source: World Bank CDRP.

Figure 9: Disaggregation of AAL due to Earthquake (as a % of the total exposure value)



Source: World Bank CDRP.

Figure 10: Disaggregation of the AAL due to Hurricanes by Province (USD million)



Source: World Bank CDRP.

accounts for 51.9 percent of the AAL. Moreover, multifamily, unreinforced concrete block masonry buildings with lime or mortar are the buildings most vulnerable to earthquakes: In the long term, annually, 0.24 percent of the total value of this building typology in Saint Lucia is affected by earthquake loss. (See Annex 2 for more-detailed results.)

Regarding hurricanes, which are the most prominent hazard in Saint Lucia, the national AAL to the building stock is approximately USD 9.51 million (EC\$ 25.68 million), or 0.66 percent of GDP. Additionally, with a return period of 250 years, these losses are expected to exceed USD 377.3 million (EC\$ 1,018.7 million), or 26.36 percent of GDP. The loss exceedance curve shows the potential hurricane losses for key return periods. Moreover, single-family, wood stud-wall frame with plywood or gypsum board sheathing buildings are buildings incurring the largest losses in the long term, accounting for approximately 30 percent of AAL. (See Annex 2 for more detailed results.)

Table 5: Potential Earthquake and Hurricane Losses to Building Stock for Key Return Periods

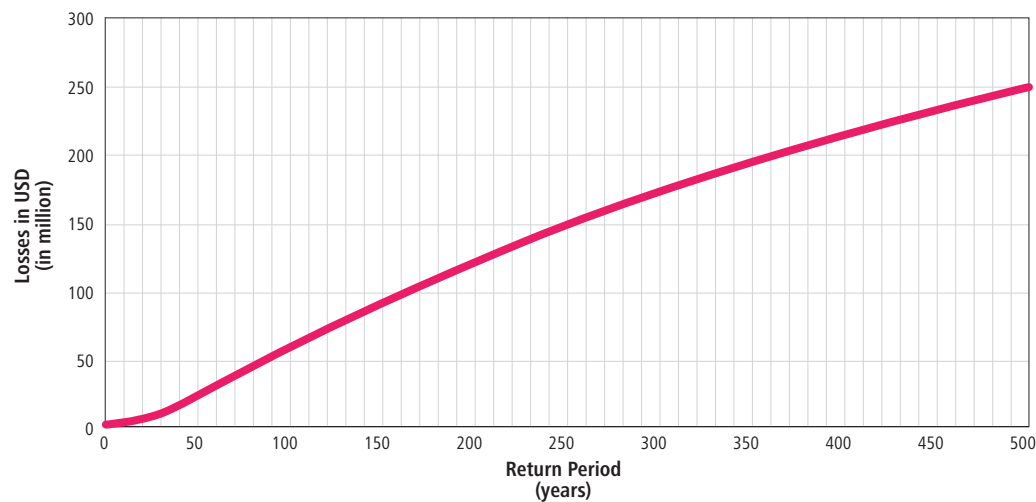
Indicative Risk Metrics	Earthquake USD million	As % of Total Building Exposed Value	Hurricane USD million	As % of Total Building Exposed Value
AAL	2.56	0.09%	9.5	0.32%
10	0.35	0.01%	10.7	0.36%
50	23.52	0.79%	134.2	4.49%
100	59.80	2.00%	228.0	7.63%
250	147.80	4.94%	377.3	12.62%
500	248.31	8.31%	498.8	16.69%

Analysis of Historical Disasters in Saint Lucia

The probabilistic risk modeling approach is more comprehensive when combined with historical losses. This study compiled a historical database of natural disasters affecting Saint Lucia in the last 35 years, from 1980 to 2015. Due to data availability, and since hydrometeorological events (floods, storms, hurricanes, etc.) constitute the major risk in Saint Lucia, actuarial analysis on the historical losses was conducted for all hydrometeorological events combined and did not include earthquakes. Analysis was performed theoretically and statistically 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 the GoSL is facing. (See Annex 3 for the methodology and key assumptions.)

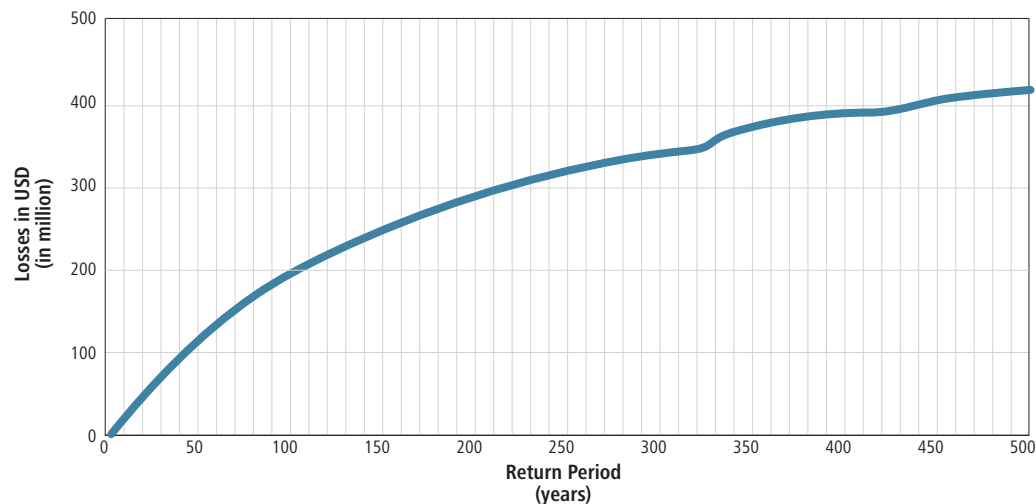
The estimated annual disaster losses to the public sector from hydrometeorological events are approximately USD 15.8 million (EC\$ 42.7 million), or 1.10 percent of GDP. Additionally, once every 100 years, these losses are expected to exceed USD 265.3 million (EC\$ 716.3 million), or 18.54 percent of GDP. That is, there is a 1 percent probability in any year that losses from a particular event will exceed USD 265.3 million (EC\$ 716.3 million). Table 6 shows the estimated losses at key return periods for the estimated total losses, public sector losses, and direct losses to the building stock.

Figure 11: EP Curve for Losses in Building Stock due to Earthquakes



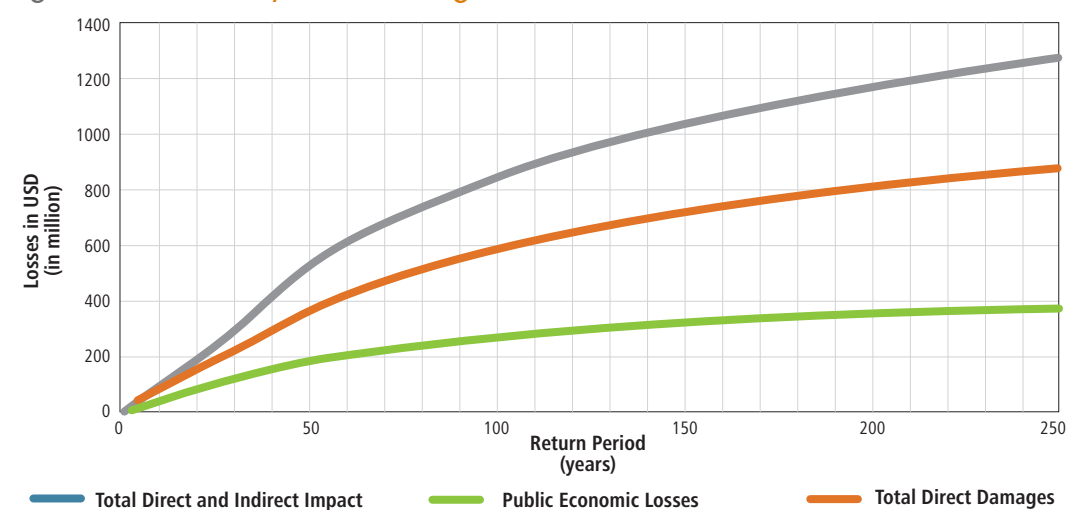
Source: World Bank CDRP.

Figure 12: EP Curve for Losses in Building Stock due to Hurricanes



Source: World Bank CDRP.

Figure 13: National Hydrometeorological Events Risk Profile – Indicative EP Curve



Source: Authors.

Table 6: Potential Flood and Wind-Related Event Losses for Key Return Periods

Indicative Risk Metrics	Total Direct and Indirect Impact (USD million)	Total Direct Damages (USD million)	Total Government Contingent Liability (USD million)
AAL	49	33	15.8
10-year return period	71	51	31
50-year return period	520	355	173
100-year return period	882	608	265
250-year return period	1,347	929	380
500-year return period	1,699	1,170	466

In summary, this fiscal disaster risk assessment provides the GoSL with an order-of-magnitude estimate of its possible public spending needs for post-disaster operations. Due to the lack of historical earthquakes events, it was not possible to perform an actuarial assessment of the possible fiscal costs of this type of natural catastrophe. The results of this assessment are used as an input to a series of options that the GoSL may wish to consider in the development of a national DRF strategy.

CCRIF products, as well as a contingent line of credit, such as a World Bank Cat DDO or IMF RCF, are financial instruments with a common particularity: They provide fast disbursements of liquidities in the aftermath of a disaster. The CCRIF 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 days⁴⁵ following the index calculation.⁴⁶ 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. More details can be found at collaboration.worldbank.org/groups/cdrp.

⁴⁵ Business days are defined as days on which banks in the Cayman Islands are open for regular business.

⁴⁶ More specifically, CCRIF has the discretion to delay payment to not more than 90 days following receipt of the insured's claim.

External Aid Flows

Over the fiscal years 2004–2014, the GoSL has borrowed USD 124 million (EC\$ 336 million) to finance post-disaster-related expenditures. Of this amount, USD 52.6 million (EC\$ 142.2 million) has come through international development partners. The GoSL has financed recovery and reconstruction using USD 6.4 million (EC\$ 17.27 million) of its own resources, and it has received USD 5.64 million (EC\$ 15.25 million) in grant resources.

The bulk of post-disaster recovery and reconstruction costs have been borne by loan financing, with a small portion coming from grants and government revenues. The largest contributor has been the use of bonds on the capital market (38.6%), followed by the Caribbean Development Bank (22.8%), the IDA (20.1%), the IBRD (6.5%), and government revenue (4.1%).

In summary, the GoSL has benefited from the responsiveness of the external community to natural disasters and has a fiscal appetite for loans to finance recover and reconstruction. However, as the use of loans is likely becoming more expensive from the perspective of debt sustainability, the GoSL's approach should shift toward lower-cost loans as part of its annual and medium-term debt management strategy, especially where disaster risk financing is concerned.

Chapter 4. Review of the Catastrophe Insurance Market in Saint Lucia⁴⁷

Catastrophe insurance is an efficient ex ante risk financing instrument through which to transfer part of a country's financial risk. This chapter aims at presenting an overview of the current insurance and reinsurance market in Saint Lucia, with a focus on private and public catastrophe insurance, providing specific insights on its capacity to play a key role in Saint Lucia's disaster risk finance strategy. Specifically:

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

Market Overview

The insurance market in Saint Lucia has suffered setbacks in recent years. Table 7 shows that the non-life insurance gross written premiums declined rather significantly from 2012 to 2014. In 2015, life and non-life insurance penetration (percent premium to GDP) was 5.7 percent, below that of the Pan-Caribbean region (5.8 percent).⁴⁸ The non-life insurance penetration was 4.2 percent in 2015. Insurance penetration in Saint Lucia has remained stagnant since 2010 and is much lower compared to the level in the early 2000. This can be attributed to both a growing economy and intense competition in the insurance sector that drove down premium rates.

Table 7: Gross Written Premiums

Gross Written Premiums (USD million)	2012	2013	2014	2015	5-Year Compound Annual Growth Rate
Non-Life Insurance	70.0	66.0	60.5	60.5	(3.58%)

Axco Country Report.

The non-life insurance market in Saint Lucia offers a range of conventional as well as non-conventional insurance products. In 2015, Fire & Property (39.8 percent of the premium) remained a key area of business for the non-life insurers in terms of gross written premiums, although it has decreased overall from 45.8 percent in 2012 (nearly a 25 percent nominal decrease).⁴⁹ Table 8 summarizes the mix of business, written by gross premium, according to the key classes of business in Saint Lucia.

⁴⁷ This high-level industry review was intended to inform recommendations to the Government of Saint Lucia 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.

⁴⁸ AM Best Special Report: A Snapshot of the Caribbean Insurance Market, September 3, 2015.

⁴⁹ GoSL. Review of the Economy 2015 Monetary and Financial Sector.

Table 8: Gross Premium Distribution by Non-Life Insurance Line of Business during Last 4 years (in percentage)

	2012	2013	2014	2015
Gross Written Premium (USD million)	70.0	66.0	60.5	60.5
Fire & Property	45.8%	41.1%	40.6%	39.8%
Automobile	23.7%	23.9%	24.6%	23.8%
Personal Accident	12.5%	12.7%	17.5%	17.6%
Lloyd's	8.3%	11.1%	11.1%	11.1%
Other	9.8%	11.2%	6.2%	7.7%

Pricing has stagnated and even decreased, which would attest to the soft market conditions for property insurance in Saint Lucia. This trend will likely 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 of loss pricing is going down and companies can purchase additional limits for the same premium and negotiate better terms at the same rates.

The majority of the residential property stock is not currently insured against natural disasters, which suggests significant growth opportunities for the insurance market. The percentage of uninsured homes in the Eastern Caribbean region varies between 70 percent and 85 percent or even more. In Saint Lucia, market practitioners estimate that the percentage of uninsured properties is approximately 80 percent.⁵⁰ In addition to low income per capita, the underinsurance is also partly due to the 2 percent catastrophe deductible clause, which has disillusioned many policyholders who have discovered that it eliminates all or a significant portion of their claim. As a result, many homeowners are deliberately underinsuring or not insuring a large portion of their risk.

Key Market Players and Reinsurance

The general insurance classes of business continued to dominate the insurance sector, contributing 75.9 percent of the total gross premium. A total of 19 insurers were registered to conduct general insurance business, including Lloyd's, which writes some direct business in Saint Lucia.⁵¹

Market participants have indicated that reinsurance ratios are approximately 60 percent for the general insurance sector, with property business being 90 percent reinsured.⁵² The quality of the reinsurance protection becomes more important for catastrophic exposures, as the domestic industry is very reliant on reinsurance recoveries in the event of a major loss.

The majority of the catastrophe exposure is transferred using traditional reinsurance techniques with a blend of proportional and non-proportional reinsurance for catastrophic exposures. There are no local reinsurance companies in Saint Lucia and no reinsurance is transacted between companies locally. Leading international reinsurers play an important role in providing reinsurance capacity for the market. The non-life insurance market depends heavily on reinsurance to protect against natural perils, of which the main one is wind. There has been little change in catastrophe reinsurance costs for Saint Lucia in recent years. Reinsurance in Saint Lucia is driven largely by the potential hurricane exposure and to a lesser extent by the flood, earthquake, and volcanic eruption exposures. There are no specific legal requirements for reinsurers and there are no locally based reinsurance companies.

Natural Catastrophe Insurance and Losses

Hurricane Tomas caused the most economic losses in the recent history of Saint Lucia. Notwithstanding the high winds, continuous heavy rainfall caused much of the damage. This combination of wind and rain led to massive and widespread destruction to infrastructure, such as roads, bridges, and the housing stock, compromised communication and public utilities, destroyed the greater part of agricultural

⁵⁰ The DRFTA Project team held discussions with the Insurance Association and private insurance providers.

⁵¹ GoSL Review of the Economy 2015 Monetary and Financial Sector.

⁵² The DRFTA Project team held discussions with the Insurance Association and private insurance providers.

production, and resulted in massive landslides, widespread flooding, and large-scale destruction of social infrastructure.

The estimated cost of loss and damage from Hurricane Tomas amounted to USD 336.2 million (EC\$ 907.7 million). The domestic insurance market paid out an estimated USD 100 million (EC\$ 270 million) following Hurricane Tomas relating to approximately 2,000 reported losses, of which 75 percent were under homeowners' policies.

The current insurance penetration of non-life insurance products that relate to catastrophe risk is very low in Saint Lucia. It is estimated that 80 percent of the residential property stock is not insured against natural disasters. To evaluate the level of non-life insurance coverage across countries, the following analysis uses a process of adjustment. The initial measure of non-life insurance penetration is adjusted by the expected losses resulting from natural catastrophe and the income level of the country. The insurance penetration shows the level of written non-life insurance premiums in a given 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 Saint Lucian market is "better insured."⁵³

Table 9: Table 9: Risk-Adjusted Insurance Adequacy for Saint Lucia, 2016

Insurance Calculation for St. Lucia – 2016	DRFTA - %
Non-life insurance penetration	4.20%
LESS expected annual loss (% of GDP)*	1.10%
Expected loss adjusted penetration	3.10%
LESS benchmark requirement (for upper middle income**)	1.60%
Benchmarked insurance coverage	1.50%
Insurance adequacy (% of GDP in USD millions)	21,540

* World Bank CDRP; estimate AAL from earthquakes and windstorms, October 2016.

** World Bank country income classification.

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

Currently, there is no insurance product in Saint Lucia specifically focused on natural catastrophe insurance.

Most insurers issue natural catastrophe coverage as extensions or endorsements of existing fire and allied perils policies. Deductibles in the market are fairly standardized, with wind and earthquake both having a deductible of USD 555 (EC\$ 1,499) or 2 percent, whichever is greater, and commercial business has deductibles of USD 925 (EC\$ 2,498). Flood insurance has a deductible of USD 370 (EC\$ 999). The earthquake probable maximum loss (PML) is 5 percent of total limits for a 250-year event and 22.5 percent of limits for a 1,000-year modeled event.

Market participants indicated that it would be beneficial for the government to purchase insurance, as can be witnessed by the 2009 St. Jude hospital fire. The hospital was not insured and the fire resulted in the hospital not yet being rebuilt completely. The GoSL has taken out loans in an attempt to rebuild the facility. In 2014, the government received a loan for USD 20 million (EC\$ 54 million) from the Export Import Bank of the Republic of China (Taiwan), which is being repaid over 20 years.⁵⁴ Additional financing may be required as well, which demonstrates the need for insurance products to cover these risks.

Catastrophe Public Insurance

Saint Lucia is one of 16 members of the Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC, formerly CCRIF), which, since June 1, 2007, has given member governments coverage against losses caused by earthquakes, hurricanes, and excess rainfall. CCRIF is the world's first multinational catastrophe insurance (not-for-profit) pool. It works on a parametric basis, with traditional excess of loss coverage supplemented by funded cat risk swaps involving the World Bank, up to a limit of USD 100 million (EC\$ 270 million) for earthquakes, with a return period of one in 20 or more years.

Unlike traditional insurance settlements that require an assessment of individual losses on the ground, parametric insurance relies on a payout disbursement contingent on the intensity of an event (e.g., wind speed, ground acceleration). In the case of CCRIF SPC, payouts are proportional to the estimated impact

⁵³ 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 percent and 1.36 percent. Countries below 0 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.

⁵⁴ USD 206,000 (EC\$ 556,200) paid in interest only over 3-year grace period equals USD 68,667 (EC\$ 185,400) in annual interest payments for 3 years, with principal and interest paid after that. See <http://www.stlucianewsonline.com/saint-lucia-to-borrow-20-million-for-st-jude-hospital-restoration>.

of an event on each country's budget. The estimated impact is derived from a probabilistic catastrophe risk model developed specifically for the facility.

In 2015, the GoSL paid an annual premium of approximately USD 1.3 million (EC\$ 3.5 million) to the CCRIF SPC for catastrophe risk insurance. The government has been using loans to finance this recurrent activity. The CCRIF SPC provided Saint Lucia with a USD 418,976 (EC\$ 1,131 million) payout for an earthquake of 7.4 magnitude in 2007. This earthquake had no reported serious damages, aside from partially damaged water lines. Saint Lucia also received a USD 3.2 million (EC\$ 8.6 million) payout for Hurricane Tomas in 2010 and another USD 3.78 million (EC\$ 10.21 million) payout for excessive rainfall as a result of Hurricane Mathew in October 2016.

Payouts from CCRIF SPC coverage can help finance response for relief in the aftermath of a disaster from the government side, when immediate liquidities are needed. The payout disbursement is to be provided within 2 weeks of a qualifying natural disaster.

Low-income individuals in Saint Lucia are eligible for insurance from wind and excess rain through the Livelihood Protection Policy (LPP), a weather index-based insurance policy launched by the Munich Climate Insurance Initiative in partnership with the CCRIF in 2013.⁵⁵ Thirty-one individuals in Saint Lucia received payouts totaling USD 102,000 (EC\$ 275,400) on their LPPs due to Hurricane Matthew.⁵⁶ The program provides swift cash payouts following extreme weather events (i.e., high winds and heavy rainfall), enabling policyholders to recover quickly following a natural disaster. The product is available across the island through local distribution channels, including cooperative banks, credit unions, and farmer associations.

⁵⁵ Munich Climate Insurance Initiative at <http://www.climate-insurance.org>. The project implemented by the Munich Climate Insurance Initiative in partnership with the CCRIF, MicroEnsure, and Munich Re

⁵⁶ CCRIF. 2016. "CCRIF Completes Payments totalling US\$29 million to Member Governments Affected by Hurricane Matthews." Available at: <http://reliefweb.int/report/haiti/ccrif-completes-payments-totalling-us29-million-member-governments-affected-hurricane-v>.

Chapter 5

Chapter 5. Recommendations for National Disaster Risk Finance Strategy in Saint Lucia

A comprehensive national DRF strategy for Saint Lucia should be designed to improve the capacity of the GoSL to access immediate financial resources in the event of a national disaster, be flexible to allow for a proportional response based on magnitude of loss, while minimizing reallocations from existing programs and maintaining the fiscal balance. Ten recommendations for a comprehensive DRF strategy in Saint Lucia 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 government, preparing the environment for financial solutions to operate efficiently, and then arranging the solutions.

Recommendations

Table 10: Strategy Recommendations for DRF in Saint Lucia

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 reconstruction expenditures.
	a. Make additional revisions to the Chart of Accounts (CoA) to have specific Detailed Object Codes (DOCs) for both disaster-related recurrent and capital expenditures and disaster-risk insurance. The designation of an activity code for Disaster Management in the Revised CoA should be consistent with the level of detail GoSL proposes.
	b. Provide NEMO with capacity building and institutional strengthening to prepare it to take on greater accountability in loss assessments and relief expenditures.
Short/Medium Term	3. Complete an inventory of public assets.*
	a. Integrate explicit contingent liabilities in budgetary planning process.
	b. Review the present definition of contingent liabilities, recognizing the difference between implicit and explicit contingent liabilities in law, with consideration of its application to natural disaster scenarios.
Short Term	4. Approve a DRF strategy.
	a. Include the accounting of contingent liabilities bases on International Public Sector Accounting Standards in a comprehensive disaster financing policy approved by the Cabinet.
	b. Publish annual debt management strategy.
	c. 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 to the government.
	5. Operationalize EDF and increase contingency reserves for public contingent liabilities associated with the events with a 5-year return period.
	a. Establish safeguards to ensure that there are appropriate funds earmarked for disaster financing, including provisions to incentivize compliance.
	b. Amend the Financial Administration Act to include a specific provision in law on the amount or ratio to be allocated annually in an interest-bearing fund for disaster financing.
	c. Strengthen the compliance on the use of the EDF to respond to short-term disaster needs as opposed to advances.

* This process has commenced, but it is not complete.

Time Frame	Instrument and Strategy Recommendations for DRF
Short Term	6. Establish a contingent line of credit to finance public contingent liabilities associated with events of a 10-year return period.
	a. Undertake an analysis of capital budget disaster financing to evaluate the cost-effectiveness of the various recovery and reconstruction projects funded by loan.
	b. Shift away from bond borrowing to lower-cost loans offered by international development partners to reduce capital expenditure used for disaster risk financing.
Medium Term	Establish a robust catastrophe risk insurance program for public assets and parastatals.
	Enhance management of contingent liability related to social protection.
Private Insurance Market	
Medium Term	Enhance availability, penetration, and affordability of private and residential catastrophe insurance. Evaluate potential for public-private partnerships (PPPs) for housing subsidies.
	Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for smallholder farmers.

* This process has commenced, but it is not complete.

Discussion

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. One of the main challenges for authorities in financial planning and response to natural disasters is the limited knowledge of the economic impact of disasters, especially at the sectoral level. Saint Lucia has an ideal system in place to collect and report information related to the damage and losses sustained by different sectors of low-frequency, high-intensity events. Under the coordination of NEMO, there are 18 district-level DANA teams. These local DANA teams feed a national DANA team to report on risk reduction before and assess damages after a disaster. However, the GoSL requires a national assessment methodology to be able to quantify by itself, in a consistent and systematic manner, the economic impacts of all disasters. These will include high-frequency and low-intensity events, as well as major disasters with a lower frequency.

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 MoF 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, a comprehensive database might take time to be fully completed.

To address this situation, the GoSL could establish a coordination mechanism to develop a standardized assessment and quantification methodology of sectoral losses in the aftermath of a disaster. This methodology would enhance coordination between the MoF and the national DRM system by providing valuable inputs to inform MoF efforts on the quantification of contingent liabilities associated with disasters. It would also promote better management of fiscal impacts associated with disasters, as well as a better understanding of the needs for climate and disaster risk reduction (DRR) measures. It would serve NEMO, the MoF, and other line ministries in improving the planning, coordination, and efficiency of reconstruction. Ultimately, this information would help in understanding not only the economic cost but also the fiscal cost of disasters, creating evidence to promote risk reduction investments as a cost-efficient way to reduce future climate and disaster losses.

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

The practice of inconsistent classification, reporting, and reconciliation, including not using the Contingency Fund, results in a situation where disaster-related finance for relief, and to a lesser extent recovery, cannot be credibly accounted for. The GoSL needs to implement a detailed classification system taking into account disaster response expenditures, using a revised CoA to enhance recording, reporting, tracking, and analysis of expenditures for DRF.

- a Make additional revisions to the Chart of Accounts (CoA) to have specific Detailed Object Codes (DOCs) for both disaster-related recurrent and capital expenditure and disaster-risk insurance. The designation of an activity code for Disaster Management in the Revised CoA should be consistent with the level of detail GoSL proposes.**

The CoA can become the main tool for tracking budget execution of resources—whether loans, grants, or government revenue—for disaster financing in both the Annual Estimates of Revenue and Expenditure and the Supplementary Estimates. The GoSL has had a draft CoA Manual since September 2014, with the intent to implement it in fiscal year 2015/16. This revised CoA will use an 18-digit classification user-defined accounting key system, which is premised on three segments:

- **The Head Segment – 7 digits: Ministry (2), Program (2), and Activity/Project (3)**
- **The Object Segment – 7 digits: Amount Type/Denomination (1), SOC (3) and DOC (3)**
- **The Funds Segment – 4 digits: Origin (1), Agency (2), and Type (1)**

The revision of the CoA will require accounting and ledger policy changes in preparation for when the new CoA is implemented. Based on the revised CoA, it is at the Activity/Project level under the Head Segment that disaster-related financing would be captured. Insurance payments, for example, would be captured under SOC 172 (DOC 0172001 for Insurance Building⁵⁷). It is recommended to have account descriptions that are specific to disaster emergency relief, recovery, and reconstruction.

The revised CoA should have as SOC for Grants from Foreign Governments (331), Grants from International Organizations, for example. The SOC with the Activity/Project code would help determine if the expenditure is for disaster financing and the origin of the grant.

- b Provide NEMO with capacity building and institutional strengthening to prepare it to take on greater accountability in loss assessments and relief expenditures.**

Coordinating a loss and damage collection system for all severities of local and national disasters would require significant institutional capacity building. Damage assessment is one component of a comprehensive fiscal risk management strategy, which requires specific information collection from the field, as well as financial and actuarial expertise for accounting for indirect economic losses. Capacity building on loss and management of natural disasters would be required to develop and use financial tools to guide the GoSL in its national DRF strategy.

3 Complete an inventory of public assets.

This recommendation complements the ongoing effort to complete a public asset register, which is 80 percent complete, according to MoF estimates. Both the inventory and the loss reporting system (Recommendation 1) would inform efforts that prioritize the reconstruction and retrofitting of critical infrastructure. 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 GoSL'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.⁵⁸ 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 MoF responsible for purchasing property insurance could be best suited to maintain the database. To better understand the collected information, the GoSL may choose to standardize and house the information on an open-source web-based platform and make it accessible to all stakeholders.

- a Integrate explicit contingent liabilities in budgetary planning process.**

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

⁵⁷ Under the current CoA, the SOC is 137 and the DOC is 0137002.

⁵⁸ World Bank. 2013. "Quantify Contingent Liabilities Associated with Natural Disasters." GFDRL Short Note 1.

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 represent the provision of public goods (e.g., schools or hospitals) or unplanned disaster response and reconstruction.⁵⁹

In general, it is difficult to estimate the cost of future disaster response and 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.

The GoSL 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 and ensuring that there are sufficient resources in the contingency reserve, and 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.

b Review the present definition of contingent liabilities, recognizing the difference between implicit and explicit contingent liabilities in law, with consideration of its application to natural disaster scenarios.

Review the existing definition 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.

4 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, 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 Include the accounting of contingent liabilities bases on International Public Sector Accounting Standards in a comprehensive disaster financing policy approved by the Cabinet.

It is recommended that the GoSL ensure that the appropriate accounting treatment is used for both contingent liabilities and any weather-related fund for budget transparency. The accounting treatment of both contingent liabilities and the weather-related fund, specifically the International Public Sector Accounting Standards, will need to be determined before implementation to inform the law.

b Publish annual debt management strategy.

It is good practice and demonstrates transparency and credibility to publish an annual debt management strategy so that the public is aware of how the government intends to satisfy its financing gaps.

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

The MoF should develop a post-disaster manual and procedures for the government, in collaboration with all the key agencies, including NEMO, with a view to shortening the time it takes to approve expenditure

⁵⁹ Potter, Barry H. and Diamond, Jack. 1999. "Guidelines for Public Expenditure Management." IMF.

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 Operationalize EDF and increase contingency reserves for public contingent liabilities associated with events with a 5-year return period.

The EDF can be the ideal instrument to address short-term disaster expenditure needs rather than the imprest account or the use of advances. The Disaster Management Act could be amended to establish EDF under the Consolidated Fund. The EDF should have a fast-disbursement mechanism, and should be further capitalized and regulated as a vehicle for the rapid financing of public post-disaster reconstruction operations. Recent experience 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 that there are appropriate funds earmarked for disaster financing, including provisions to incentivize compliance.

If the GoSL is to implement a dedicated EDF to respond to disasters, it would need to enshrine these provisions in law and put in place additional safeguards to ensure that its use is prescribed by law. This caution is especially important given that the current Contingency Fund is not being used for the purposes for which it was created.

b Amend the Financial Administration Act to include a specific provision in law on the amount or ratio to be allocated annually in an interest-bearing fund for disaster financing.

It is recommended that the GoSL include a specific provision in law on the amount or ratio to be allocated annually for disaster financing. The 0.9 percent of GDP represents such a proxy and can be built up over time to meet the average financial loss. This fund should be an interest-bearing account to remove the opportunity cost of having bank balances that are attracting only bank charges. The EDF does not currently facilitate this kind of “fund management,” but there is nothing in law that prevents it from being invested.

c Strengthen the compliance on the use of the EDF to respond to short-term disaster needs as opposed to advances.

The GoSL could also implement legal incentives to encourage compliance with the main fiscal law. An annual budget calendar should be published so that civil society can track the government’s adherence to its own legally prescribed and administrative activities in the pursuit of accountability, credibility, and transparency.

6 Establish arrangement contingent line of credit to finance public contingent liabilities associated with events of a 10-year return period.

Engaging international development partners to develop more-flexible instruments addresses not only reconstruction but also relief and recovery. The GoSL requires a 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,

Box 1: 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; Bennett, Federico R. 2017. *Leaning Against the Wind: Fiscal Policy in Latin America and the Caribbean in a Historical Perspective*. LAC Semiannual Report; April 2017. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/26364> License: CC BY 3.0 IGO.



a World Bank Cat DDO or IMF RCF, which is complementary to CCRIF SPC, is customizable in terms of triggers and cost-effectiveness to optimize coverage of varying impacts of natural disasters.

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.

a Undertake an analysis of capital budget disaster financing to evaluate the cost-effectiveness of the various recovery and reconstruction projects funded by loans.

Over the study period, the bulk of post-disaster recovery and reconstruction costs have been borne by loan financing, with a small portion coming from grants and government revenues, which suggests that the GoSL has a fiscal appetite for loans to finance recovery and reconstruction. It is thus important to evaluate the cost-effectiveness of these loan-funded projects and assess their short-, medium-, and long-term impact on the government's fiscal sustainability.

b Shift away from bond borrowing to lower-cost loans offered by international development partners to reduce capital expenditure used for disaster risk financing.

The use of bonds is likely to be more expensive from the perspective of debt sustainability. Where multilateral financial institutions have available resources, the GoSL's preference curve should shift toward these lower-cost loans as part of its annual and medium-term debt management strategy, especially where disaster risk financing is concerned. Disaster risk financing should be a very specific and different component of the GoSL's debt management strategy.

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

Although governments often self-insure public assets, they can often benefit from transferring a portion of their risk to the private insurance markets. Being relieved of this contingent obligation enables them to allocate scarce resources to meet immediate post-disaster financing relief and recovery needs. The World Bank has assisted countries in pooling the risks borne by public assets and purchasing insurance that allows for these risks to be structured and allocated efficiently. This approach can enable governments to insure public assets at a lower cost than if insurance was purchased by individual managers of public assets.

In addition, the GoSL needs to undertake an actuarial review of the insurance policies of parastatals with a view to implementing a specific public sector policy and regulations on the procurement of insurance for the public sector. There is also a need for monitoring and strict enforcement to ensure that parastatals are compliant with relevant laws and regulations in relation to insuring against natural disasters.

The GoSL 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.

8 Enhance management of contingent liability related to social protection.

Flexible social protection systems that are triggered by disasters and that are 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 social protection 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 social protection schemes and their impact on budget is also key.

Private Insurance Market

9 Enhance availability, penetration, and affordability of private and residential catastrophe insurance. Evaluate potential for public-private partnerships (PPPs) for housing subsidies.

It is important that the GoSL 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. A government 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 needs of different sectors of society, and lead to sound policy making and DRF decisions.⁶⁰

The Insurance Council of Saint Lucia is well positioned to partner with the GoSL in designing a PPP for catastrophe insurance. The local insurance industry has demonstrated a desire to work with the government to expand natural disaster protection throughout the island.

Figure 14: Advantages of PPPs to Governments and the Insurance Industry

Advantage for governments
<ul style="list-style-type: none"> • Microinsurance can bring a cliente-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
<ul style="list-style-type: none"> • 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 clientes 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.

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

10 Enhance data sharing on agricultural insurance and develop more-robust and -affordable products for small-holder farmers.

Agriculture's contribution to Saint Lucia GDP is estimated at 2.8 percent for 2015—a 25 percent increase in contribution over 2014⁶¹—but the percentage of Saint Lucia's labor force employed in agriculture is 21 percent.⁶² Some of the challenges facing Saint Lucia's competitiveness in the global economic context are due to its small size and the scarcity of its resources. However, many of the more significant challenges stem from Saint Lucia's vulnerability to natural disasters. The rapid progress observed in recent years

60 Ramm, G. 2011. "Public-private partnerships in microinsurance." Discussion Paper No. 001. Luxembourg: Microinsurance Network.

61 Inter-American Institute for Cooperation on Agriculture, Annual Report 2015.

62 CIA World Factbook.

in addressing the challenge of insuring poor smallholder farmers and pastoralists in the developing world suggests that index insurance has the potential to benefit smallholder farmers at a meaningful scale.⁶³

The Ministry of Agriculture, Food Production, Fisheries, Cooperatives and Rural Development is developing an Agriculture Disaster Risk Management Strategy for Saint Lucia, and the DRFTA Project recommends that the GoSL explore successes and challenges in agricultural PPPs in SIDS, especially in parametric micro-insurance products for smallholder farmers, such as reinvigorating the Windward Islands Crop Insurance Ltd (WINCROP) for multiple crops. WINCROP provides mandatory statutory insurance and optional contractual insurance against loss of banana holdings by windstorm and volcanic eruption.⁶⁴ WINCROP is the result of lessons learned by several failed agricultural insurance attempts in the Eastern Caribbean. Previous attempts failed because of abuses in the system, difficulties in obtaining reinsurance, high claims payments, and lack of insurance experience. Essentially a small farmer organization, seed capital was contributed by the farmer organizations for the growers and there are no government contributions. In 2010, the weakness of the existing indemnity scheme was exposed after Hurricane Tomas destroyed around 80 percent of the banana crop in Saint Lucia and St. Vincent. Many thousands of small-scale farmers were left with no income for 8 months, dependent on income support from the government or charities. Since Hurricane Tomas, WINCROP has struggled to obtain affordable reinsurance. Changing coverage from indemnity insurance to parametric insurance would mean that risk could be more easily quantified.

Another area to consider for possible governmental support is the improvement of the technical capacity to overcome some of the limitations in the provision of insurance. Even though weather data and weather risk maps are available, local insurers may require additional technical capacity in contract design and monitoring and to access reinsurance markets.

Table 11: Examples of Agricultural Insurance PPPs

	Agriculture Catastrophe Insurance (Peru)	Component of Assistance against Natural Disasters (Mexico)
Risk	Agricultural catastrophe Drought, excess humidity, frost, low temperatures, floods, avalanches, hail, fire, wind, high temperatures, and pests Undefined crops	Catastrophe Meteorological risks (drought, cols, hail, snow, torrential rain, low temperatures, flooding, tornadoes, and cyclones) and geological events (earthquakes, volcanic eruptions, tsunamis, and landslides) Crops and livestock
Ministry/ government entity	Ministry of Agriculture	Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food
Levels of government	Central and state	Central and state
Target audience	Farmers, such as peasant communities, native communities, small- and medium-scale farmers	Vulnerable smallholder farmers defined as producers with up to 20 hectares of annual crops, up to 10 hectares of fruit crops, or up to 60 animal units
Year of launch	2009	2003
Premium payment	Central Government – 100%	For the ex ante insurance component, central government 80%–90%, state 10%–20%, which has changed over time
Enrollment	Local agricultural agencies	State agricultural agencies
Outreach	Insured area up to 490,000 ha, average number of beneficiaries per year, 56,000	As of 2013, 12 million ha and 10 million animal units (75% and 70% of the estimated target population, respectively)

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

63 Greatrex H. et al. 2015. Scaling up index insurance for smallholder farmers: Recent evidence and insights. Climate Change, Agriculture and Food Security Report No. 14. Copenhagen.

64 CARICOM. 2010. "Looking inward for agriculture insurance solutions – CCRIF sees potential for expanded role in Agriculture Risk Management." Press Release 279/2010.

Annex 1. Operational Disaster Risk Financing and Insurance Framework

Table A1-1: Actions Taken by Governments for Financial Protection

Actions by Governments for Financial Protection of the State		Actions by Governments for Financial Protection of Society		
Beneficiaries				
Actions	Government – National & Local (Sovereign DRFI)	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 dataQuantify potential disaster related losses from fiscal and budget perspectiveAssess potential post-disaster (short term and long term) funding gaps	<ul style="list-style-type: none">Collect and manage risk and loss dataQuantify potential disaster related losses from property damageIdentify proportion of losses incurred by public and private stakeholdersAssess capacity of domestic insurance markets		<ul style="list-style-type: none">Collect and manage disaster risk and loss/impact dataQuantify potential disaster related losses on low-income populationQuantify fiscal impact of potential disaster related losses through social protection programs
Arrange Financial Solutions	<ul style="list-style-type: none">Develop Financial decision making toolsDevelop 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 transferSecure 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 breaksCompulsory vs voluntary schemesAwareness/education of consumers on insurance productsDevelop domestic supply of insurance<ul style="list-style-type: none">Assess legal and regulatory environment to allow private sector to develop/test private insurance solutions while protecting consumersRisk data collection, management and sharingProduct development (indemnity and index based)Insurance pools		<ul style="list-style-type: none">Secure contingent funding for social protection programs against disastersComplement/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 fundEstablish transparent, timely and effective post disaster loss reporting mechanismsEstablish 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 processDelivery channels through insurance agentsAlternative 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	Reduce Underlying Drivers of Risk			

Table A1-2: 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, RDFONDEN 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 PPP 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>	As a PPP the Turkish Catastrophe Insurance Pool relies on the domestic insurance market for the distribution and claims settlement.	<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	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	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.		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

Annex 2. Saint Lucia Country Disaster Risk Profile

SAINT LUCIA 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.

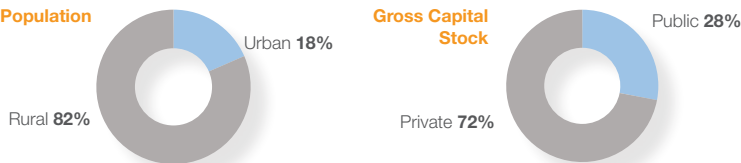
Country Disaster Risk Profile

Applications

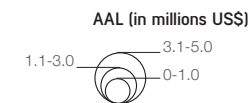
- ▶ Inform disaster risk financing
- ▶ Develop key baseline data
- ▶ Evaluate impact of disasters
- ▶ Promote and inform risk reduction

Country At-A-Glance

GDP US\$ 1.4 billion | Population 180,000 | Total Building Exposure US\$ (Replacement Value) 3.0 billion



Two representations of hurricane risk

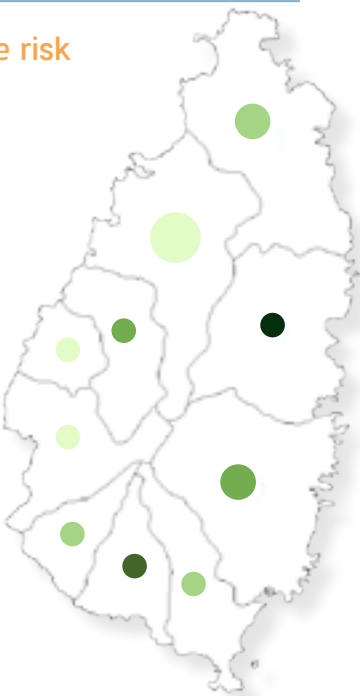


Provinces by ratio (AAL/Province Exposure)

lowest ratio highest ratio

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 Dennery which has a higher proportion of vulnerable structures due to construction types and/or potentially higher hurricane intensity.



Snapshot

- ▶ The **hurricane risk** in Saint Lucia is **more significant** than the **earthquake risk**.
- ▶ Annual Average Loss (AAL) from **hurricanes** is **US\$ 9.5M (0.7% of GDP)** and from **earthquakes** is **US\$ 2.6M (0.2% of GDP)**.
- ▶ The Probable Maximum Loss for **hurricanes** (250 year return period) is **US\$ 382M (27.2% of GDP)** and for **earthquakes** (250 year return period) is **US\$ 148M (10.5% of GDP)**.
- ▶ Single family, wood stud-wall frame with plywood/ gypsum board sheathing are the buildings most vulnerable to **hurricanes**, **accounting for 30% of AAL**.

COUNTRYDISASTER RISK PROFILES

SAINT LUCIA

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**.

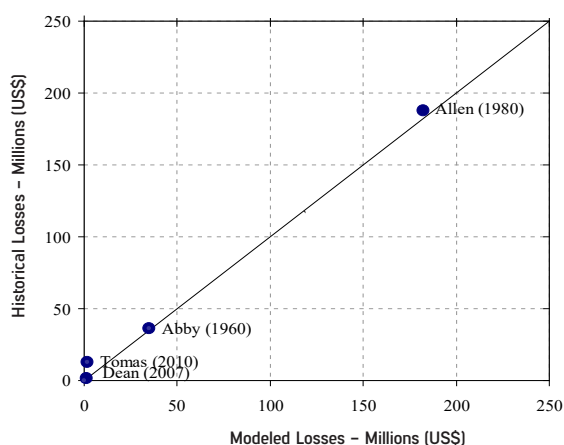
The map provides the value of residential and non-residential buildings in each province at risk from hurricanes and earthquakes.



Building Exposure

(in percentage of total)

- 0.4 - 5.0
- 5.1 - 10.0
- 10.1 - 20.0
- 20.1 - 50.0 (no province in this range)
- 50.1 - 54.0



What have been the historical losses?

Saint Lucia has suffered significant losses from hurricanes. The direct losses have been modeled to a high degree of accuracy in the risk profile. In 1980, Hurricane Allen struck Saint Lucia. If this historical event were to happen in 2016, it would cause a loss of US\$ 188M, amounting to 13.4% 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 Saint Lucia 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 cdrp@worldbank.org



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Annex 3. DRFTA Project Methodology of Quantifying Contingent Liability

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 geoReferenced 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 10in50 year loss or a 10in250 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.

