**Graduate Institute of International Development, Agriculture and Economics**

# AN ASSESSMENT OF THE IMPLEMENTATION OF DISASTER RISK REDUCTION POLICIES IN THE AGRICULTURAL SECTOR OF JAMAICA AND DOMINICA

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# Dedication

I wish to dedicate this dissertation to my late mother, Jane Elizabeth Herbert Wiggins (1954-2018), a dedicated educator, who taught me the importance of education.

# Acknowledgement

I give thanks to God the Father, always, for everything, in the name of our Lord Jesus Christ (Ephesians 5:20).

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# List of Acronyms

| | |
|---|---|
| ADRM | Agriculture Disaster Risk Management |
| CARICOM | Caribbean Community |
| CCRIF SPC | Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company |
| CDB | Caribbean Development Bank |
| CDEMA | Caribbean Disaster Emergency Management Agency (CDEMA) |
| CRED | Centre for Research on the Epidemiology of Disasters |
| CSA | Climate-smart agriculture |
| DEC | District Emergency Committees |
| DFID | The Department for International Development (DFID) |
| DR | Disaster Risk |
| DRM | Disaster Risk Management |
| DRR | Disaster Risk Reduction |
| EC | Eastern Caribbean |
| ECCB | Eastern Caribbean Central Bank |
| ECLAC | The United Nations Economic Commission for Latin America and the Caribbean |
| EM-DAT | The Emergency Events Database |
| FAO | The Food and Agriculture Organization of the United Nations |

| | |
|---|---|
| GDP | Gross Domestic Product |
| GHGs | Greenhouse gases |
| HFA | Hyogo Framework for Action |
| IDB | The Inter-American Development Bank |
| IFRC | The International Federation of Red Cross and Red Crescent Societies |
| IPCC | The Intergovernmental Panel on Climate Change |
| JIS | Jamaica Information Service |
| LCDS | The Low-Carbon Climate-Resilient Development Strategy |
| MICAF | The Ministry of Industry, Commerce, Agriculture and Fisheries Jamaica |
| MOAFF | The Ministry of Agriculture, Food and Fisheries of Dominica |
| NDC | National Disaster Committee |
| NDMP | National Disaster Management Policy |
| NEPO | National Emergency Planning Organization |
| NGOs | Non-governmental organizations |
| NDP | National Disaster Plan |
| NRDS | National Resilience Development Strategy |
| ODM | Office of Disaster Management |
| ODPEM | The Office of Disaster Preparedness and Emergency Management |
| PADRM | Parish Agriculture Disaster Risk Management |
| PDC | Parish Disaster Committee |

| | |
|---|---|
| PEA | The Political Economy Analysis |
| PIOJ | The Planning Institute of Jamaica |
| RADA | The Rural Agriculture Development Authority of Jamaica |
| SDG | Sustainable Development Goals |
| SFDRR | Sendai Framework for Disaster Risk Reduction |
| SIDS | Small Island Developing States |
| STATIN | The Statistical Institute of Jamaica |
| UN | The United Nations |
| UNDP | The United Nations Development Programme |
| UNDRR | (formerly the UNISDR) The United Nations Office for Disaster Risk Reduction |
| UNFCCC | The United Nations Framework Convention on Climate Change |
| UNGA | The United Nations General Assembly |
| UNISDR | See UNDRR |

# Abstract

The Caribbean region continues to be impacted by the negative effects of natural hazards associated with tropical storms which have been costly to governments and contribute to a reversal in their sustainable development efforts. This has more so been the experience in the agriculture sector that has traditionally been the most important sector for Caribbean economies. Research shows that disaster risk reduction (DRR) has been effective in reducing the impacts of disasters. However, as countries have implemented DRR in their management of natural hazards associated with tropical storms, through the establishment of DRR legal and institutional frameworks, and received international support for DRR activities, few studies have been conducted on the effectiveness of these policies in reducing the vulnerabilities.

This study aims to assess the implementation of DRR policies in Jamaica and Dominica, using existing DRR frameworks in order to conclude on best practices, which will inform the development of resilience strategies for other Caribbean countries. Building on the body of knowledge available in this area, the research employed the qualitative case study approach to examine and compare existing DRR legal and institutional frameworks in Jamaica and Dominica. Priority areas were extracted from existing DRR frameworks and semi-structured interviews were conducted with officials and stakeholders to investigate their adoption at various levels to highlight best practices for policy development in the Region. The results indicate that mainstreaming in the agriculture sector and DRR would require disaster risk legislation, a diversified funding stream targeting DRR activities, and policies aimed at increasing disaster risk knowledge. Further research would require an in-depth examination of DRR policy implementation, in-country.



**Keywords:** Disaster risk reduction, Policies, Development, Caribbean, Agriculture sector


(13,742 Words)

# Chapter 1: Introduction

## 1.1 Introduction

A longstanding problem for governments has been the disruptions to development and losses in lives and property as a result of disasters (Hillier and Nightingale, 2013). Governments are forced to divert scarce resources aimed at reducing poverty to rebuilding after an event (Wisner *et al.*, 2004). It is predicted that natural hazards are expected to increase in frequency and intensity (Webster *et al.*, 2005; Villarini and Vecchi, 2013; IPCC, 2018) and as a consequence become costlier for national governments who are responsible for intervening to protect the most vulnerable.

Consequently, studies have found that by reducing and managing risk factors which are hazard, exposure and vulnerability, losses can be prevented, and disaster impacts reduced (Cardona *et al.*, 2012). This has resulted in a shift in government policy response from emergency management to disaster risk reduction (DRR) which may include the development of DRR policy and mainstreaming DRR into development policy and planning (UNDP, 2007).

Evidence suggests that governments in the Caribbean region have made progress in the establishment of legislative and institutional arrangements for disaster risk reduction (Carby, 2011). Nevertheless, ineffective implementation of DRR policies are being blamed on the existence of weak national institutional and legislative arrangements in many academic research (UNDP, 2007; Carby, 2011). However there has been very little studies conducted on the effective implementation of DRR policies in the Caribbean

region. Further, few studies are available on the progress of mainstreaming of DRR into sectoral policies such as agriculture.

## 1.2 General Background

*Location and Issues*

The Caribbean region located north of South America, east of Central America, and south of North America, consists twenty-six (26) island countries with a population of approximately 45 million persons. This region vulnerable to the risks of natural hazards associated with hurricanes including tropical storms, excess rainfall, flooding and landslides each year due to its location near the equator.

Tropical storms are the most frequently occurring natural hazards in the Caribbean region according to the EM-DAT (CRED, 2019) database which recorded 270 storms between 2000 and 2019. The most recent disastrous event took place during the 2017 Atlantic hurricane season which occurs from June 1$^{st}$ to November 30$^{th}$. The 2017 season saw economic losses, totalling over US$80 billion, to a number of countries including Dominica, Antigua and Barbuda and Puerto Rico as well as human losses of over 200 (CRED, 2019). Hence, there is great need for research on the impacts of disasters in the Caribbean and the processes that hinder or support the reduction of disaster risks.

*Disasters Impacts on the Achievement of the SDGs by Caribbean SIDS*

Moreover, it has been well established that disasters impact development (DFID, 2005). Caribbean Small Island Developing States (SIDS) have been recognised by the United

Nations as countries in special situations with unique challenges in relation to the achievement of the Sustainable Development Goals (UNGA, 2014). These challenges include their small size and vulnerability to disasters which are increasing in intensity due to anthropogenic climate change, disproportionately affecting SIDS. Caribbean SIDS are also heavily dependent on agriculture for their livelihoods (UNGA, 2014). The achievement of poverty eradication and economic growth goals are oftentimes reversed so that there is a critical need for effective DRR policies aimed at minimizing natural hazard impacts.

*Global Environmental Change and Justice Issues*

Furthermore, it has increasingly become accepted that global climate change has resulted from the emission of greenhouse gases (GHGs), predominantly, by developed countries. However, the impacts of climate change disproportionately affect developing countries such as Caribbean SIDS who are unable to cope with the increasing cost of these events (Paavola and Adger, 2006). It is also evident that while climate change occurs at the global or regional level, it is local communities and institutions that are overwhelmed by its effects.

Nevertheless, it is the country's government who are ultimately responsible for disaster management, and oftentimes lack capacity (financial, human and technical) and organisational capabilities that developed countries have to effectively respond to these emerging issues of environmental change. This presents an issue of justice and fairness for the global community, as the increasing costs of climate change are being borne by these developing countries rather than the developed countries, who have historically

been responsible for these costs and are benefitting from increasing emissions of GHGs. It is therefore international institutions that are expected to appropriately apportion the responsibility for climate change and resolve issues of justice and fairness in global environmental change.

*The Caribbean Response*

Meanwhile it is the governments of Caribbean SIDS that are responsible for protecting its vulnerable people from the harm caused by hazard impacts by ensuring that social justice is meted out to all citizens. While the history of natural hazards show that government policy had been traditionally one of recovery and reconstruction, research has indicated a shift towards the inclusion of DRR strategies. Reducing risks and vulnerabilities is seen as a key ingredient for these countries to achieve sustainable development.

Caribbean SIDS have therefore adopted DRR legislative and institutional arrangements such as Dominica National Disaster Management Policy (NEPO, 2001), Jamaica's National Disaster Risk Management Act 2015 (The Government of Jamaica, 2015), Dominica Office of Disaster Management, Jamaica Office of Disaster Preparedness and Emergency Management and other community level institutions.

Previous research on the status of DRR implementation in Caribbean region have indicated that countries have made some progress in a number of areas including the development of legislation and institutional framework (Carby, 2011). However, these improvements are not being manifested by reduced impacts after the passage of natural

hazards associated with hurricanes. Moreover, Caribbean studies rarely assess the implementation of these DRR policies to document best practices as this research aims to accomplish.

### 1.3 Justification for the study

Therefore, as the intensity and cost of disasters are expected to increase as a result of anthropogenic climate change, Caribbean SIDs would be required to ensure that DRR legislative and institutional arrangements are robust and can ensure that all sectors of the countries would bounce back from natural events with minimal disruptions. This would involve identifying and addressing weaknesses in DRR systems. Likewise, identifying factors that would encourage mainstreaming of DRR in sectoral policies, in areas such as agriculture, could serve as a guide to relevant agencies.

This study would add to the limited research assessing the implementation of DRR policy, legislative and institutional arrangements (Manyena *et al.*, 2013) and would serve as a guide for the development of DRR policies for similar countries in the Caribbean Region.

### 1.4 Research Aim

The aim of this study is to assess the implementation of DRR policies in Jamaica and Dominica, with particular emphasis on the Agricultural Sector, using existing DRR frameworks, in order to conclude on the best practices which can be used to strengthen or inform the development of DRR policies in the Caribbean region.

## 1.5 Research Questions and Objectives

**Table 1.1: The objectives of the study and research questions**

| Objectives | Research Questions |
|---|---|
| 1. To critically examine DRR policies in Jamaica and Dominica | 1. What DRR policies have been adopted in Jamaica and Dominica to reduce disaster risk and losses?<br>2. How are DRR policies being implemented at the various levels of Governance in Jamaica and Dominica? |
| 2. To analyse and compare effective implementation of DRR policies in Jamaica and Dominica | 1. What are the existing DRR frameworks that can be used to assess DRR policies? |
| 3. To highlight from evidence best practices for the development of DRR policies to Caribbean SIDS who are also vulnerable to disaster risks. | 1. What are the main elements that explain the successful implementation of DRR policies in Jamaica and Dominica? |

## 1.6 Structure of the Study

The paper is organised as follows: Chapter 2 presents a literature review on disaster risk reduction providing the important historical movements, the conceptual framework of DRR and its strategies and measures. In Chapter 3 we will discuss the methodology for this research. Chapters 4 and 5 presents the findings of the study and Chapter 6 contains a discussion of the major findings of this study and its conclusion. The final chapter also provides the implications for policy and future research. The research also includes sections containing the references used and the appendices.

# Chapter 2: Literature Review

## 2.1 Introduction

The aim of this literature review is to explore the concept of disaster risk reduction and provide the rationale for the implementation of DRR policies. The concept of disaster risk reduction has evolved since the 1970s into a cross and multi-disciplinary approach to reducing disaster risks and minimizing vulnerabilities in countries exposed to natural hazards.

Given the wide range of the field of disaster risk reduction, a detailed review is beyond the scope of this study. However, it will provide a reflection on the concepts of disaster and disaster risk reduction as well as linkage with the implementation of DRR policies.

## 2.2 Disasters

Disasters have received global attention in recent decades due to its diverse impacts that could include social, economic or environmental factors occurring at different levels (international, regional, national or local), which may develop slowly with some degree of predictability (hurricanes and tropical storms), or occur with no warning such as an earthquake. According to the EMDAT database (CRED, 2019), 315 global disasters occurred in 2018 which affected approximately 68.5 million people and resulted in 11,804 deaths and US$132 billion economic damages.

A contributing factor to this outcome was that low human development countries could ill-afford to protect their citizens from hazardous events or continue on their development path by reducing poverty (Pelling *et al.*, 2004). Research has also found that disasters impede the progress towards development (DFID, 2005). However, the implementation of appropriate DRR policies by Governments can limit future disaster impacts and promote economic resilience.

### 2.2.1 Definition of Disasters

The United Nations Office for Disaster Risk Reduction (UNDRR) formerly known as UNISDR (2017) define disasters as "*a serious disruption of the functioning of a community or a society due to hazardous events interacting with conditions of vulnerability and exposure, leading to widespread human, material, economic and environmental losses and impacts.*" However, there is a lack of consensus on the definition of the term disasters due in-part, to the changing perspectives overtime as subsequent research revealed new understanding and categorisations of hazardous events (Oliver-Smith, 1999).

### 2.2.2 Historical views of disasters

Disasters were viewed as an 'act of God' at the early stages of development and as a result, nothing could be done about it (Quarantelli, Boin and Lagadec, 2018). As society progressed, this 'supernatural paradigm' was replaced with the 'hazard paradigm', which is the idea that disasters were caused by nature (Wisner *et al.*, 2004). Additionally, the

response to these ‘natural disasters’ involved disaster policy promoting preparedness and the development of emergency response mechanisms (Cannon, 1994).

However, in the 1980s, a new paradigm emerged which rejected the hazard paradigm including the view that disasters were ‘natural’ and emphasised that the socio-economic development factors of a country were responsible for the vulnerability of its citizens to natural events thereby resulting in ‘disasters’ (Wisner *et al.*, 2004). The vulnerability approach, as it is now known, postulates that the risk of losses from the impact of hazards is directly linked to existing vulnerability.

As a result of this new approach, a new field emerged which saw a shift in the response to future hazardous events; from that of preparedness and recovery to disaster risk reduction and its measures. Hence, the examination of disaster risk reduction will commence with an exploration of the concepts of hazards, risk and vulnerability.

## 2.3: Components of Disaster Risk Reduction - Hazards, Risk and Vulnerability

### 2.3.1 Hazards

The UNISDR (2017) defines hazards as “*a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation*.” UNISDR (2017) further states that hazards can be formed from natural, anthropogenic (due to human negligence) or socio-natural processes.

Hewitt and Burton (1971) further classified hazards, which can be characterised as infrequent, severe, involving multiple households and disruptive, into five categories as shown in Table 1.1. Researchers also suggest that we are in a period where human effects on the earth are dominant, termed the Anthropocene, and that most disasters could be aggravated by human activity (Waters *et al.*, 2016; Gill and Malamud, 2017).

**Table 2.1: Classification of Hazards**

| Atmospheric | | Hydrologic | Geologic | Biologic | Technologic |
|---|---|---|---|---|---|
| **Single** | **Combined** | | | | |
| Excess rainfall<br>Freezing rain (glaze)<br>Hail<br>Snow<br>High winds<br>Extreme temperatures<br>Fog | Hurricanes<br>'Glaze' storms<br>Thunderstorms<br>Blizzards<br>Tornadoes<br>Rain and wind storm<br>Drought<br>Heat wave | Floods – river and coastal<br>Wave action<br>Waterlogging<br>Icebergs<br>Rapid glacier advance | Mass-movement including<br>Landslides<br>Mudslides<br>Avalanches<br>Erosion<br>Earthquake<br>Volcanic eruption<br>Shifting sands | Epidemic in humans<br>Epidemic in plants<br>Epidemic in animals<br>Locusts<br>Forest and grassland fires | Transport accidents<br>Industrial explosions and fires<br>Accidental release of toxic chemicals<br>Nuclear accidents<br>Collapse of public buildings |

Adapted from Hewitt and Burton (1971) and the Asian Disaster Preparedness Center (ADPC) (2003)

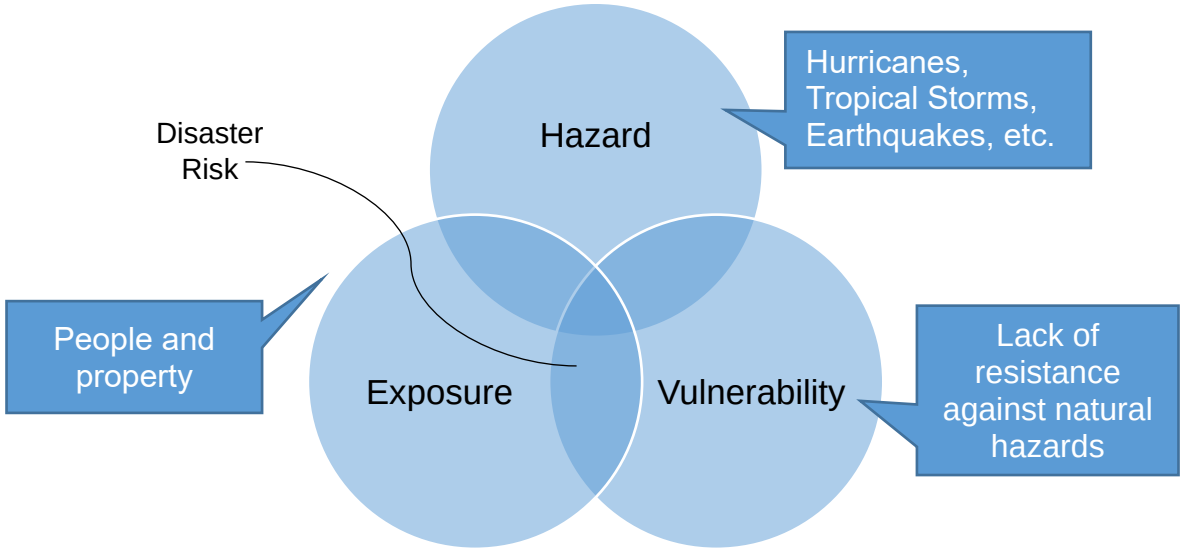
### 2.3.2 Risk

UNISDR (2017) defines disaster risk as "*the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity*". A popularly used equation for expressing this definition of disaster risk is written as follows (Wisner, Gaillard and Kelman, 2012):

$$DR = H \times V$$

where DR refers to disaster risk, H refers to hazards, V refers to vulnerability. This shows that hazardous events are theoretically not the main drivers of disaster risks but include for the most part the level of existing vulnerability and exposure of the society as illustrated in Figure 1.1.

Figure 2.1: Components of disaster risk illustrated




**Source:** (Asian Disaster Reduction Center, 2005)

### 2.3.3 Vulnerability

The concept of vulnerability has been explained in hazard literature as the factors that causes a person, group or system to be susceptible to the damaging impacts of a hazard. Vulnerability may therefore be an individual, household, community or national condition.

Given the growing body of literature and research on this concept, many definitions exist, some of which are presented in Table 1.2. It can be seen that most of these definitions are similar and articulate vulnerability as a result of *exposure to harm*, *present circumstances or location* and *capacity to cope*. Further research has been undertaken on the factors of vulnerability and their social, economic and political dimensions (Turner *et al.*, 2003; Adger, 2006; Füssel, 2007).

**Table 2.2: Commonly used definitions of Vulnerability**

| Author and Year | Definition |
|---|---|
| Cutter (1996) | *The likelihood that an individual or group will be exposed to and adversely affected by a hazard* |
| Turner *et al.* (2003) | *The degree to which a system, subsystem, or system component is likely to experience harm due to exposure to a hazard, either a perturbation or stress/stressor* |
| Wisner *et al.* (2004) | *The characteristic of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard* |
| IPCC Glossary (2014) | *The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.* |
| UNISDR (2017) | *The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.* |

## 2.4: The concept of "Disaster Risk Reduction (DRR)"

The concept of disaster risk reduction emerged from the realisation that reducing the impacts of disasters require moving beyond disaster and emergency response to the development of an integrated approach to disaster management (Cardona *et al.*, 2012).

This concept has evolved overtime and, today, recognise the linkage between disasters and development.

The Department for International Development (DFID) (2005) describes DRR as measures employed "*to curb disaster losses, through minimising the hazard, reducing exposure and susceptibility and enhancing coping and adaptive capacity*". On the other hand, UNISDR (2009) recognised the holistic approach of DRR as the "*concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events*".

From the latter definition the following are implied: firstly, that there is a problem, i.e. factors of disasters, which include, "*exposure to hazards and vulnerability";* secondly, it is of concern to people and property; and thirdly, that it requires analysis and management to increase '*adaptive capacity*' and '*lessen vulnerability'*. Achieving this aim seems to imply the presence of a system, institution or community agency which would be responsible for coordinating the implementation of these activities through various means to bring about this change. It can be inferred that the coordinating hand of government manages the DRR process (Wilkinson, 2012)

This process has been found to employ various strategies, including policies, since disasters have long been identified as a policy problem requiring the attention of governments. DFID (2005) classified these strategies as Policy and planning, physical

(prevention), Physical (coping or adaptive) and community capacity building (See Box 2.1 for detailed description).

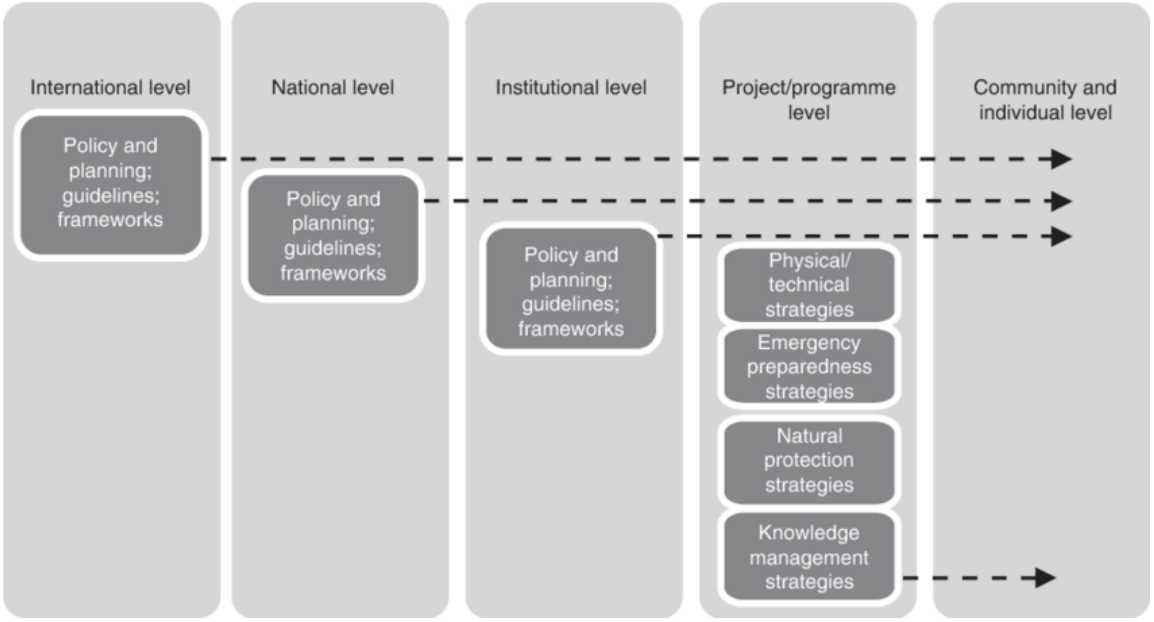
**Box 2.1: Classification of DRR strategies**

- **Policy and planning**: institutional, policy and capacity-building measures designed to increase the abilities of countries to manage disaster risks. Specific measures could include the development and implementation of Early Warning System (EWS), land-use planning that better incorporates flood risk and management of water supply, integrated warning and response system, and improving networks / links with local governments.
- **Physical (prevention):** building sea-walls as part of flood defence mechanisms and other measures including natural protection against floods e.g. reforestation of watersheds and installation of drainage pumps.
- **Physical (coping / adaptive):** flood shelters for use during a disaster event. Flood proofing of latrines and tube wells, construction of resilient roads and infrastructure, e.g. raised buildings and roads, design and construction of mechanisms to cope with flooding and other disasters.
- **Community Capacity building:** developing a disaster preparedness committee that would provide community training and develop community warning systems

*Source: DFID (2005)*

Various literature have also recognised that DRR strategies are implemented by several actors (government institutions, aid organisations, community-based entities) operating at different scales (before, during or post the event) and levels such as at the international/regional, national, institutional or community/individual level illustrated in Figure 2.2 (Burton *et al.*, 2012; Wisner, Gaillard and Kelman, 2012; Palliyaguru, Amaratunga and Haigh, 2013).

Figure 2.2: Classification of DRR measures at various levels




(Source: Extracted from Palliyaguru, Amaratunga and Haigh, 2013)

These strategies have also targeted specific sectors of the economy that are especially vulnerable to the impacts of natural hazards, such as the agricultural sector, and involve DRR mainstreaming into development plans.

## 2.5 Existing Disaster Risk Reduction Frameworks

DRR frameworks were developed for use in government, non-governmental organisations (NGOs) and development partners. These include Mitchell's multi-hazard DRR Mainstreaming Framework (2003), IDB Indicators of Disaster Risk and Risk Management (Cardona, 2005), ProVention's 'Measuring Mitigation' initiative (Benson and Twigg, 2004), and the UN Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015). A summary of these frameworks is presented in Box 2.2.

**Box 2.2: Selected DRR Frameworks**

**Mitchell's DRR Mainstreaming Framework** emphasised a stakeholder approach to reducing disaster risks in which mainstreaming of DRR is accomplished through the cooperation and collaboration with government agencies and organisations (Mitchell, 2003). It includes 20 indicators that collects data on the situation of DRR mainstreaming in the country with benchmarks to grade performance of the responses (Mitchell, 2003).

The **IDB's Indicators of Disaster Risk and Risk Management** is a quantitative approach to risk management (Cardona, 2005) that seek to identify areas for risk reduction, quantify elements of vulnerability within disaster prone countries and promote collaboration between agencies through information sharing. The framework consists of a system of indicators four composite indicators have been designed to represent the main elements of vulnerability and show each country's progress in managing risk. They are the 'Disaster Deficit Index', the 'Local Disaster Index', the 'Prevalent Vulnerability Index', and the 'Risk Management Index' (Cardona, 2005).

**ProVention's 'Measuring Mitigation' initiative** is no longer being supported by the UK government's Department for International Development (DFID) however it is grounded in ensuring that risks are 'mainstreamed' in the work of development organisations' projects and programmes and thus the overall development framework of a country (Benson and Twigg, 2004).

**The United Nations Sendai Framework for Disaster Risk Reduction 2015-2030**, the successor to the Hyogo Framework for Action 2005-2015, (UNISDR, 2015) was adopted by UN Member States in 2015 and outlines seven targets and four priorities for action to mitigate and reduce existing disaster risks by 2030 (See Appendix 1). Its aims to "substantially reduce of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries" by encouraging countries to develop and implement a systematic approach to disaster risk management.

A review of academic literature found that similar research on the effective implementation of DRR policies were generally evaluated in relation to governance structures and institutions together with the priority areas of the United Nations Frameworks (Manyena *et al.*, 2013; Jones *et al.*, 2014; Chipangura, Van Niekerk and Van Der Waldt, 2017; Mashi, Oghenejabor and Inkani, 2019). Nevertheless this research intends to go a step further by analysing other frameworks to determine priority areas which can be used to analyse the implementation of DRR policies.

## 2.6 Analytical Framework

Most of the issues discussed so far in this chapter presents a background for the analytical framework to be used in this study. This includes that DRR measures, specifically policies, can be adopted by governments to reduce the impacts of disasters which affect the most vulnerable.

The Political Economy Analysis (PEA) framework seeks to understand the processes that may hinder or support the adoption of DRR policies thereby contributing to a reduction or an increase in vulnerability (UNISDR, 2011). A political economy analysis of DRR policy implementation would enable a response for the questions of *how* DRR policy is being implemented in the study countries and the reasons *why* they differ in performance (UNISDR, 2011).

According to Wilkinson (2012), "*political economy analysis focuses on the institutions through which policies are developed and on understanding the links between politics and the economy, with a focus on power relations, incentives, and the influences within formal and informal processes".* Although many definitions exist for the term 'institution', which is typically associated with a country's governance structure, within PEA the term refers to the formal instruments, including legislation and policies to guide action, organisational arrangements such as the actors, roles and responsibilities, and mechanisms of accountability (Manyena *et al.*, 2013).

Research suggests that uneven implementation of DRR policies may be explained by a lack of political will and incentives, information deficiencies and coordination problems at various levels of governance (UNISDR, 2011; Wilkinson, 2012).

In relation to lack of political will and incentives, research suggest that a number of complex factors may constrain the provision of DRR public goods and services including competing priorities for government funds; lack of technical capacity and experience in dealing with some disasters; focus on improving recovery and reconstruction rather than DRR; rent-seeking and corruption which exists with formal regulation; opposition and resistance to forms of control and regulation from interest groups and citizens; and governments yielding to the influence of political pressure groups rather than implementing necessary DRR policies (UNISDR, 2011; Wilkinson, 2012).

Regarding information deficiencies, research indicates that informational problems may impact the performance of government DRR policies and these include factors such as the lack of knowledge regarding risks, policy options available for implementation, and uncertainty about the future outcomes of policy measures adopted (Gaillard and Mercer, 2012; Wilkinson, 2012).

Turning now to coordination problems among various actors in DRR policy, research has acknowledged that many actors are involved in achieving DRR outcomes which operate at different levels in government that have their own priorities and mandates (Wilkinson, 2012). Studies show that there are issues regarding power in multi-agency collaboration

and that understanding the dynamics of power is important for effective DRR policy implementation (VeneKlasen *et al.*, 2002; Mascarenhas and Wisner, 2012).

Furthermore, there are issues regarding decentralisation, which in some countries, are not formalized and are fully dependent on central government for funding to carry out local DRR activities (Wilkinson, 2012). Additionally, given that international organisations are requiring more participation and conduct of DRR activities at the local level, there are also issues regarding the lack of resources and technical capacity, to participate in community-based DRR (Gaillard and Mercer, 2012).

A review of the Hyogo Framework implementation in selected Caribbean countries indicated progress in some areas such as in the development of institutional and legal frameworks and community–based disaster management. This is despite weaknesses in areas such risk transfer at the community level and mainstreaming of DRR in important sectors of the economy due to lack of resources and weak institutions (Carby, 2011). This highlights the need for sustained efforts to DRR which calls for increased political will, better coordination of national institutions, and increased funding for DRM (Carby, 2011).

## 2.7 Conclusion

In conclusion, this chapter presented an overview of the key concepts of DRR and provided the justification and use of the institutional factor of political economy analysis for investigating the effectiveness of the implementation of DRR policies. It was

determined that the political economy analysis was used in similar research together with the United Nations DRR frameworks. This was aimed at understanding the processes which governments use to respond to the needs of the vulnerable people affected by disasters, including DRR policies.

In this context, this study aims to provide further research on DRR policies that have been implemented in Jamaica and Dominica and with emphasis on the agricultural sector, to conclude on their effectiveness and to highlight best practices for the development of DRR policies in other Caribbean SIDS.

# Chapter 3 Methodology

## 3.1 Introduction

The previous chapter presented the framework for the conduct of this study and indicated that by conducting this assessment, we can examine the processes, which promote or encourage these reductions to inform other countries in the Caribbean region that are also vulnerable. This will be based on the institutional factor of political economy analysis and will be structured by using key characteristics for successful DRR identified from internationally accepted DRR frameworks.

This chapter will provide information on the research approach used, study area, research methods, method for analysis the data compiled, challenges and limitation and ethical considerations for this study.

## 3.2 The Study Area

The study will focus on Jamaica and Dominica, which are located in the Caribbean Region.

Dominica is an island country of 286.5 square miles with a population of approximately 71,000 persons residing in ten parishes with St. George, which contains the capital city of Roseau (Central Statistics Office, 2011). Geographically, the island is mountainous and volcanic in origin and most of its population and infrastructure can be found on the coast. The administration of Dominica is divided into two parts: national and local.

The head of the national government is the Prime minister who is appointed by the non-executive President of Dominica. While there is no provision in the constitution of Dominica for local government, this consists of three municipal councils and thirty-eight (38) village councils and is overseen by Central government (Ministry of Social Services Community Development and Gender Affairs, 2002).

Economic activity in Dominica, once dominated by the agriculture sector as a result of banana exports, is now driven by the services sector and recorded an annual Real Gross Domestic Product (GDP) of US$500 Million for 2018 (ECCB, 2019).

Meanwhile, the mountainous island country of Jamaica has a total size of approximately 4,244 square miles and population of 2.7 million (JIS, no date). The country is divided into three counties, which are further subdivided into 14 parishes, and its capital, Kingston, is the largest city.

In Jamaica, the head of state is the Queen of England who is represented by a Governor General. The Governor General appoints the prime minister and also is responsible for assenting to parliamentary bills however it is the prime minister and cabinet that guides government policy. At the local government level, government business is further decentralised through local authorities, overseen by the Department of Local Government, and these entities are the Kingston and St. Andrew Corporation (KSAC), the Portmore Municipal Council and 12 parish councils (JIS, 2016). The economy recorded an annual Real Gross Domestic Product (GDP) of US$14.6 Billion for 2017, which was dominated by services industries (Statistical Institute of Jamaica, 2019b).

Figure 3.1 Map of Dominica


Source: (Ontheworldmap, no date)

Figure 3.2 Map of Jamaica


Source:(Statistical Institute of Jamaica, 2019c)

### 3.3 Research Approach

A qualitative research approach was undertaken by this study to assess the implementation of DRR policies in Jamaica and Dominica. The main reason was that the researcher is interested in understanding the descriptive process of DRR policy rather than the outcome (Maxwell, 2008). This stems from the discussion in the literature review where an in-depth examination of the processes involved, and the actors is required. While qualitative research has been criticised as being too subjective, not generalisable due to its use of small and purposefully selected samples and lacking quality (Hammersley, 2007; Silverman, 2017), the depth and richness of information it provides (Creswell, 2013) offers strength and longevity to this method.

The specific research approach employed in this study is the case study approach which is used to obtain in-depth insight into a contemporary event or phenomenon (Crowe *et al.*, 2011; Yin, 2014). According to Yin (2014), a case study is best suited to answering 'how' and 'why' questions regarding a contemporary event or phenomenon in which the researcher has little or no control. In this research, the case study approach will best answer the question of 'how' the DRR policies are being implemented by various actors and 'why' there are successes in the implementation of a particular strategy and also 'what' are the areas that need improvement (Crowe *et al.*, 2011).

### 3.4 Research Method

#### Qualitative Critical Content Analysis

For this study, the qualitative method using critical content analysis was adopted based on the tasks required to answer the research questions. There were two aspects to this method, which involved primary and secondary data as outlined in the sections below. The replicability of qualitative critical content analysis has been identified as a key feature that adds to the reliability and validity of results (Krippendorff, 2018).

### 3.4.1 Secondary Data Review

Critical content analysis involved a process of collating and analysing data based on a desktop study of all relevant information available regarding DRR in Dominica and Jamaica. Online sources included websites of the regional and nation disaster management agencies and other relevant government agencies, as well as websites of key international agencies involved in DRR such as the UNISDR preventionweb.org where preliminary reports and policies were obtained.

Further, academic sources were obtained through searches on Google, Scopus and the University of Reading library database using one or more of the following search terms: Dominica, Jamaica, disaster risk reduction, DRR policy, hurricanes, and agriculture. Moreover, interviewees were also asked to supply the researcher with relevant documents related to DRR. However, there were challenges in identifying contacts for this information, which was solved by establishing contact through a regional agency, Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC).

### 3.4.2 Primary Data

#### Semi-Structured Interviews

Primary data were compiled using semi-structured interviews which were conducted remotely face-to-face via skype or a forum agreed to by participants due to the location of the interviewees and were digitally recorded for better data management. Semi-structured interviews assume that the interviewer would not know what all the questions are (Lune and Berg, 2016).

#### Sampling Method and Tools

Interview participants were selected purposefully in the first instance based on their role in the disaster management agencies, their knowledge and experience and contacts. According to Creswell (2013), this is advantageous since it will give the researcher a better understanding of the problem and answers to research questions. From the initial contacts, snowball sampling was used to identify additional participants that the researcher had no knowledge of but were able to provide relevant information to the study. Lune and Berg (2016) highlighted that snowball sampling is the best way to identify participants that would be difficult to reach but may have opinions, which are relevant to the study.

The researcher conducted seven (7) semi-structured interviews from stakeholders working in the countries at the national (6) levels and further at the Caribbean regional (1)

level in DRR. The researcher submitted and was granted ethical clearance for the conduct of interviews. Although a number of gateways existed for making contacts with the proposed agencies within these countries and regional institutions, a direct approach was attempted in the first instance through email contact, which was obtained from the agencies' website. This was unsuccessful and no response was received. A supporting letter from CCRIF SPC together with contact information from this agency assisted in gaining interviews for this research.

The respondents that were successfully contacted, and provided permission for the conduct of the interview, were included in this research. They were also sent an information sheet with details of the study. A list of questions for the interviews was prepared based on the literature review and other research and can be found in Appendix 3.

The interview questions were sent to interviewees before the date of the interview to enable them to have some of the responses prepared. The interviews were digitally recorded and after the interview, recordings were transcribed and analysed.

### 3.5 Data Analysis

After the policy information and interview data were compiled and analysed, a comparison was conducted based on the literature review and frameworks. Data compiled were included in the context and response chapters. The most important sound bites from the

interviews were selected for inclusion in the response chapter as well as information which could explain the differences in DRR implementation in the two countries. The researcher also focused on differences and similarities between literature and data and reflected on the possible reasons for the outcomes.

### 3.6 Challenges and Limitations

There is concern that examining only two case studies would limit the generalizing capacity of findings, however care was taken to ensure that enough data was gathered using at least two methods to make general conclusions. Challenges were also seen in gaining the cooperation of interview subjects. It was very difficult to gain the cooperation of government officials given that responses were not received to initial emails sent. In this regard, the researchers contacted a number of gatekeepers to gain introductions.

### 3.7 Positionality and Ethics

For this research, an ethical clearance was requested and obtained from the University of Reading prior to conducting interviews (See Appendix 4). All participants were informed about the purpose of the interview, the intended use of the information obtained, confidentiality of information and anonymity to ensure that the University's standards on research ethics were maintained.

Participants were also informed that interviews would be recorded and were given assurance that these will be kept secure and would be destroyed six months after the interview on a specified date according to ethical standards of the University. A separate

code was assigned to the responses of individual participants. Further, the researcher advised the participants that if so desired the results of the study could be sent to them.

### 3.8 Conclusion

This chapter introduced the study countries and discussed the methodology for the conduct of this research. The discussion highlighted the justification for the use of the qualitative research approach, specifically the case study approach, to gain an in-depth understanding of the process of DRR policy implementation in Jamaica and Dominica.

The discussion further noted the research methods that were adopted for this study; that of critical content analysis which involved a secondary data sources, and primary interviews of DRR experts and the process used to compile this information.

A description of the procedure used to analyse the data was also presented as well as any challenges, limitations and ethical concerns to be addressed, since it was important to assure readers about the reliability of this study. The ensuing chapters will therefore present and analyse the data compiled using the methodology discussed in this chapter.

# Chapter 4: Context

## 4.1 Introduction

In the previous chapter, it was theorised that disasters negatively impact the development pathway of a country resulting in increased poverty and vulnerability and that governments intervene to protect the vulnerable population by implementing DRR measures. This chapter therefore presents a characterisation of the nature of disaster risk, in the context of hurricanes, for Jamaica and Dominica. Specific emphasis will be placed on the agriculture sector over the past decade in order to investigate the effectiveness of DRR policies implemented. Additionally, the chapter will discuss the IPCC predictions for Caribbean SIDS and its risk for the agriculture sector.

## 4.2 Natural Hazard and Risk Profile of Jamaica and Dominica

### 4.2.1 Natural Hazards

During the hurricane season, which occurs from June to November each year, an increasing number of tropical storms are formed and a few develop into hurricanes of different strengths. Since 1900, EMDAT (The Emergency Events Database) listed fourteen (14) Meteorological events for Dominica while for Jamaica there were thirty-one (31) such events (CRED, 2019).

The total economic cost of damages was estimated to be over US$5 billion over the period (See Table 4.1). For Jamaica events, within the last decade, occurred multiple times per year between 2000 and 2010. Meanwhile, for Dominica, the last two hurricane

events which occurred were similar in impact to an event in 1979. It is possible that there has been an increase in the magnitude and intensity of tropical storms.

**Table 4.1: Natural Hazards since the 1900s occurring in Jamaica and Dominica**

| Country | Disaster type | Number of Events | Total deaths | Total affected | Total damage ('000 US$) |
|---|---|---|---|---|---|
| **Jamaica** | Flood | 8 | 643 | 296,372 | 87,440 |
| | Flash flood | 1 | 15 | 551,340 | 30,000 |
| | Riverine flood | 4 | 72 | 56,000 | 51,000 |
| | Storm | 2 | 4 | 5,000 | 1,000 |
| | Extra-tropical storm | 1 | 0 | 125,000 | - |
| | Tropical cyclone | 28 | 604 | 1,579,705 | 2,662,182 |
| **Dominica** | Tropical cyclone | 14 | 2140 | 196,283 | 2,223,060 |
| | | | | | **5,054,682** |

Source: EM-DAT: The Emergency Events Database - Universite catholique de Louvain (CRED, 2019)

### 4.2.2 Hazard Impacts

As a consequence of increasing hurricane events, on a macro level, most sectors of the economy of affected countries have been impacted economically, financially and socially. Table 4.2 shows evidence of the impact of hurricanes and tropical storms on the agriculture sector since the early 2000s for Jamaica and Dominica. Loss of jobs and incomes, inputs for other sectors and destruction to critical infrastructure are some damaging results of these impacts.

Further macro level effects can be seen in Chart 4.1 which illustrates the contribution of the Agriculture sector as a percent of GDP since 2000 and shows a decline in the percentages for years in which major storms occurred such as the early 2000s, 2007 and 2017. Both countries saw increasing percentages from 2000 to 2017 which was probably

as a result of diversification through the production of non-traditional crops to be more resilient to food insecurity. However, this would require further research. Agriculture is noticeably, of higher significance in Dominica than Jamaica and increasingly so since the latter has transitioned into a 'diversified tourism-driven economy' (World Bank-LAC, 2012).

Table 4.2 also reveals that within Jamaica, a large number of crops are lost as a result of hurricane impacts and therefore there is loss of potential earnings. The data shows that while there appears to be no significant pattern of losses within the past decade, the cost of crop damage can be high nonetheless.

On a micro level, the poor are the most affected by natural hazard events and small farmers are usually numbered among the poor. While poverty rates in Jamaica in recent years increased to just over 20 per cent, poverty in Dominica was significantly higher at 39 percent in 2003 and 28.8 percent in 2009 (See Table 4.3).

**Table 4.2: The Impact of Hurricanes on the Agricultural Sector of Dominica and Jamaica for selected years using the Sustainable Livelihood Framework**

| Country | Year | Total Hectares of crops damaged | Number of farmers affected | Total Cost of damage to the agricultural sector |
|---|---|---|---|---|
| **Jamaica** | | | | **(J$M)** |
| | 2002 | 2,422.7 | 17,974 | 1,013.1 |
| | 2004 | 11,100.0 | 117,700 | 8,550.1 |
| | 2005 | 1,266.0 | 8,199 | 379.9 |
| | 2005 | 1,655.0 | 18,179 | 248.8 |
| | 2007 | 5,354.0 | 63,707 | 3,716.0 |
| | 2008 | 2,777.0 | 22,710 | 1,678.3 |
| | 2010 | 3,740.0 | 16,895 | 576.5 |
| | 2012 | 2,815.0 | 37,000 | 1,452.0 |
| | | | | |
| **Dominica** | | | | **(EC$M)** |
| | 2007 | 1,890.0 | 3,200 | 44.8 |

| Country | Year | Total Hectares of crops damaged | Number of farmers affected | Total Cost of damage to the agricultural sector |
|---|---|---|---|---|
| | 2011 | --- | --- | --- |
| | 2015 | --- | 4,343 | 127.3 |
| | 2017 | 100% | 25 percent of labour force | 380.2 |
| | | EC$M 350.6 (Crop loss) | | 149.2 |

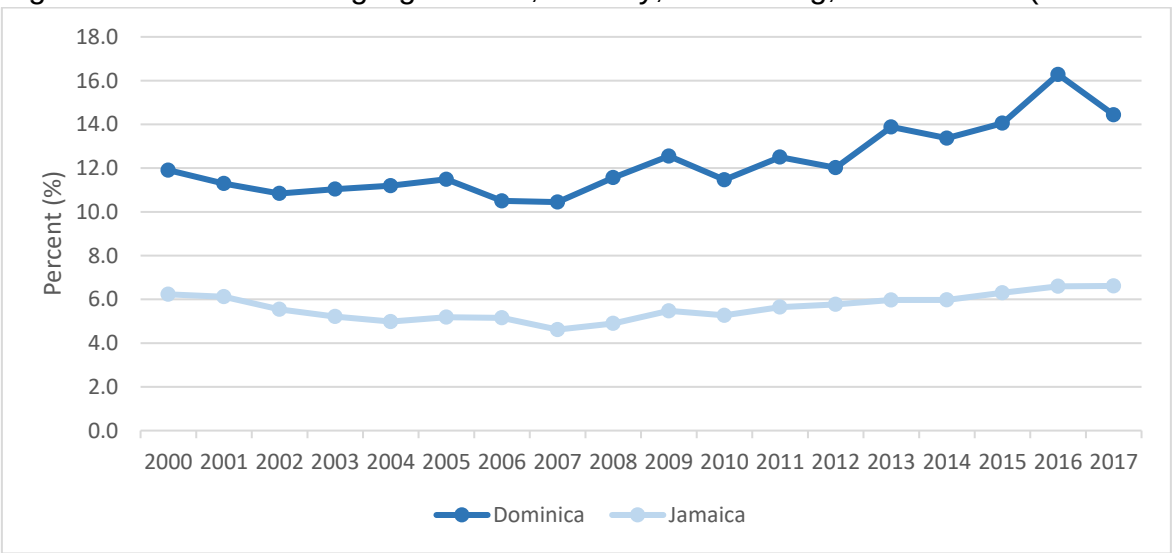
*Source: (Post Hurricane Damage Impact Assessment Reports, Various Years)*

**Table 4.3: Poverty Rates for Dominica and Jamaica for Selected years**

| Country | 2003 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| **Jamaica** | 19.1 | 16.5 | 17.6 | … | 19.9 | 24.6 | 20.0 | 21.2 |
| **Dominica** | 39.0 | 28.8 | … | … | … | ... | ... | … |

Sources: Statistical Institute of Jamaica (2017) and Dominica Country Poverty Assessment (CDB, 2008)

Figure 4.1: Chart showing Agriculture, forestry, and fishing, value added (% of GDP)




Source: (World Bank, 2019)

**Table 4.4: Agriculture, forestry, and fishing, value added (% of GDP)**

| Country | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| Dominica | 11.6 | 12.6 | 11.5 | 12.5 | 12.0 | 13.9 | 13.4 | 14.1 | 16.3 | 14.4 |
| Jamaica | 4.9 | 5.5 | 5.3 | 5.6 | 5.8 | 6.0 | 6.0 | 6.3 | 6.6 | 6.6 |

Source: (World Bank, 2019)

### 4.2.3 Vulnerabilities and Exposure

The literature review identified a number of components of vulnerability in relation to natural hazards (See Table 4.5). For the countries under study, the significant impacts of natural hazards over the years have been due to the high level of vulnerability and exposure of some communities within Jamaica and Dominica. Some communities in Jamaica are exposed to natural hazards associated with hurricanes due to their physical location in the flood plain of a river or stream. Similarly, agricultural production suffers from exposure due to farming locations on steep hillsides in the island's center. This may generate environmental vulnerabilities such as erosion and landslide hazards associated with hurricanes (ECLAC/UNDP/PIOJ, 2004).

Assessment reports have also indicated that the production of traditional agricultural crops that are exposed to high winds, such as bananas and sugar cane, on the flat coastal plain increases their susceptibility to flooding and wind damage associated with hurricanes (PIOJ, 2008).

Meanwhile, Dominica's damage assessment reports indicate that the physical topography of the island, the saturated soil conditions and the location of most of the population on the coast of the island have resulted in increased exposure to natural hazards (Commonwealth of Dominica, 2015). As the interior of the island is mountainous,

rainfall runoff is short which leads to flooding in coastal locations which intensifies natural hazard impacts.

Increasing hurricane events have also exposed a number of economic vulnerabilities which reduces their ability to rebuild and recover. This includes the high dependence on agriculture despite declining wages and market conditions, particularly for Dominica, and the absence of agricultural insurance that would cover exposure to natural hazard impacts.

Immediately after an event, there is often an over-reliance on imports when local produce are destroyed, which the poor are unable to afford or access. This results in a worsening of inequality, given the high poverty rates in rural communities and poor infrastructure.

**Table 4.5: Some risk factors identified in damage assessment reports that lead to damage and loss in the agriculture sector.**

| Hazard | Excessive or prolonged rainfall causing flooding and landslide activity |
|---|---|
| Exposure and Vulnerability | Agricultural crops grown in low lying areas |
| | Agricultural crops grown on steep hillsides |
| | Physical: underdeveloped and damaged infrastructure, degraded and eroded hillsides |
| | Economic: Low wages for farmers, lack of insurance, high poverty rates and inequality |

*Source: (Post Hurricane Damage Assessment Reports, Various Years)*

### 4.3 Vulnerabilities within the Agriculture Sector of Jamaica and Dominica

The vulnerabilities of the Caribbean agriculture sector has been well documented (Barker, 2012; Gould, 2015) especially in relation to the high risks of natural hazards such as hurricanes. An examination of this evidence for Dominica and Jamaica in Table 4.4 shows

that while the percentage contribution of Agriculture to GDP remained significant for Dominica increasing from 11.6 percent in 2008 to 14.4 percent in 2017, the contribution in Jamaica increased marginally between the two periods by 1.7 percent from 4.9 percent.

Further, the agriculture, forestry and fishing industrial group reported 15.2 percent of the population was employed in this occupation in Dominica while for Jamaica the percentage of persons employed was marginally higher at almost 16 percent. Because of the high risks there is evidence that employment in this sector has declined as compared to previous decades. This indicates a possible movement from the agriculture sectors into other sectors of the economy as a result of periodic declines in earnings as a result of the hurricane impacts which begs further research regarding this result.

Further evidence can be seen in the terms of trade for the two countries, as shown in Table 4.6, as imports of food increased dramatically by 87 percent in Jamaica for the 10 year period from 2004 to 2013 while domestic exports contracted by 6.3 percent. For Dominica, on the other hand, terms of trade showed much deterioration as imports of food increased noticeably by 62 percent from 2004 to 2013 while domestic exports experienced a sharp decline of 73 percent from 2004 to 2013 (CARICOM Secretariat Regional Statistics, 2019). These results suggest an increased over-reliance on food imports which may have implications for food security for these countries.

The type of crops grown is also indicative of the vulnerability of the agriculture sector of Jamaica and Dominica. The top five (5) agricultural crops grown in Jamaica were bananas, citrus, coffee, cocoa and pimento (MICAF Jamaica, no date) while Dominica's main agricultural crops were bananas, plantains, roots and tubers, fruits, and herbal oils

and extracts (CARICOM Secretariat Regional Statistics, 2019). Bananas are known to be highly susceptible to damage from high winds and has a crop cycle of nearly a year long which increases their vulnerability to tropical storms as compared to crops with shorter crop cycles (Mohan, 2017).

FAO (2008) characterised the agricultural sector of Dominica as consisting a large number of privately owned small farms which practice intercropping based on climatic conditions. Table 4.6 also shows the total area under farming and reveals that there has been a marked decline in the total active land under farming for Jamaica for all categories of agriculture between the two censuses. This suggests reduced agriculture output as a result of hurricane impacts, which may have implications for food security.

**Table 4.6: Selected Agricultural Indicators for Jamaica and Dominica**

| Selected Agricultural Indicators | Jamaica | Dominica |
|---|---|---|
| **Land Under farms** | 29% or 325,810 (2007)<br>39% or 421,550 (1996) Agriculture Census | 28% or 21,146 hectares (1995) Agriculture Census |
| **Total Land Area** | 1,094.5 Thousand hectares (STATIN) | 75.1 Thousand hectares |
| **% of Persons Employed in the Agriculture Industry** | 15.9% (2018) STATIN<br>205,200/1,345,900 | 15.2% (Census 2011) |
| **Food Exports(US$ Mn)** | $232.2 (2013)<br>$247.8 (2004) CARICOM | $3.8 (2013)<br>$14.3 (2008) CARICOM |
| **Food Imports (US$ Mn)** | $961.2 (2013) CARICOM<br>$515.1 (2004) CARICOM | $38.7 (2013) CARICOM<br>$23.9 (2004) CARICOM |
| **Food Exports as a % of total Exports** | 15.7% (2013) CARICOM | 10.8% (2013) CARICOM |

Sources: (Commonwealth of Dominica, 1995; Statistical Institute of Jamaica, 2007, 2019a; Central Statistics Office, 2011; CARICOM Secretariat Regional Statistics, 2019)

### Insurance

The evidence shows that in addition to diversifying the agriculture sector and transitioning to other sectors, countries have also purchased risk insurance policies provided by the

CCRIF SPC for tropical cyclone, earthquake and excess rainfall. According to CCRIF (2015), these products are provided at a low cost to ensure that countries can afford coverage. Moreover, CCRIF policies do not cover all losses as a result of natural hazards but government loss. While these countries do not have access to agriculture insurance currently, the CCRIF SPC has stated that it is in the process of providing insurance for agricultural losses due to drought and losses attributed to climatic disturbances with the fisheries and aquaculture sectors (CCRIF, no date).

On one hand, CCRIF SPC has made three (3) pay-outs to Dominica since its inception for damages after the earthquake event in 2007, for excess rainfall during Tropical Storm Erika in 2015 and following the passage of Tropical Cyclone Maria in 2017 (CCRIF, no date). On the other hand, excess rainfall events in Jamaica has, thus far, not triggered pay-outs.

### 4.4 Climate Change predictions for the Caribbean Region

Moreover, vulnerabilities are expected to increase for Caribbean SIDS which would require DRR interventions. The IPCC (2018) predicts that global temperatures would likely increase by 1.5°C above pre industrial levels between 2030 and 2052 due to human activity if there is no change to current behaviour. Hoegh-Guldberg et al. (2018) also predicts that the Caribbean region will experience 0.5–1.5 degrees Celsius of warming in comparison to a 1971–2000 baseline and an increased risk of drought.

Although, there has been no conclusive evidence to show that increasing sea temperatures are related to the recent trend in hurricane activity (Taylor *et al.*, 2012), a

study by Webster et al. (2005) concluded that global data indicate a trend towards more frequent and intense hurricanes, but more research was needed to provide a link with global warming.

### 4.5 Climate Change predictions for Dominica and the Agricultural Sector

In relation to the countries under study specifically, IPCC (2007) predictions of more intense hurricanes are expected to be the greatest threat to Dominica in the 21st century. In recent years Category 4 and 5 hurricanes have devastated the island that continues to recover from these impacts. It is also predicted that Dominica will experience more intense and prolonged rainfall during tropical storm events. Additionally, given the mountainous terrain of the country, increased incidence of flooding are expected as well as landslides and destruction of roads and other infrastructure.

In relation to agriculture, The Second National Communication of Dominica to the United Nations Framework Convention on Climate Change (UNFCCC) (Commonwealth of Dominica, 2012a) outlines that intense hurricanes are likely to have a damaging effect on agricultural production and infrastructure.

Climate change would also affect coastal population and as most of the population of Dominica reside in coastal areas, the expected rise in sea level would threaten people, property and critical infrastructure located in these areas and make them vulnerable to flooding and tropical storms. While the main crop of Dominica, bananas, would not be affected as much by higher temperatures due to its suitability to areas with higher temperatures, the Black Sigatoka or Black Leaf Streak Disease which is the main threat

to the banana industry, is predicted to become more aggressive with increased temperatures (Calberto, Staver and Siles, 2015).

Figure 4.2: Black Sigatoka or Black Leaf Streak Disease

Source: (Dominica News Online, 2015)

These projected impacts should indicate to policy makers the need for revised land policy to shift the population and infrastructure from vulnerable areas to more resilient land. It should also indicate that there is need for infrastructure development planning to reduce the effects of landslides and to ensure slower runoffs from hillsides during heavy rainfall.

### 4.6 Climate Change predictions for Jamaica and the Agricultural Sector

As it relates to Jamaica, the main climate change predictions are similar to those of the rest of the Caribbean and include sea level rises, increased temperatures, decreased summer precipitation, and intense tropical cyclone activity. The estimated future sea levels by 2100 is expected to climb from 0.18m to between 0.59m and 1.4m while the average temperature for Jamaica is predicted to be as much as 2.45 degree Celsius by 2080 and this is expected to be accompanied by frequent droughts (Selvaraju *et al.*, 2013).

The agricultural sector is expected to be impacted by the changing climate through crop yield loss, destruction of banana crops and livestock as well as agricultural infrastructure. For example, during tropical storms and hurricane events, disruptions to the fishing industry are expected due to swells generated by storm-force winds. Sea level rise is expected to impact the fishing industry through the reduction in the number of fishing beaches available to fishers.

### 4.7 Summary

To summarise this chapter, the literature review presented in Chapter 2 postulated that reducing vulnerabilities is key to reducing disaster risks and that it is the Government's responsibility to implement DRR policies to protect its citizens. Hence, this chapter has therefore outlined the evidence of vulnerabilities in Caribbean SIDS, as illustrated by Jamaica and Dominica, which are compounded due to natural hazards associated with hurricanes that are impacting the region each year. Moreover, climate change predictions for Jamaica and Dominica indicate that vulnerabilities are expected as more intense hurricanes and rainfall are likely.

The evidence from this chapter clearly provides justification for the governments of these countries to implement DRR policies for the agriculture sector to protect lives and livelihoods. The next chapter will therefore examine the DRR policies and the institutional arrangements that have been established in these countries and provide a critical analysis to conclude on best practices for the agriculture sector.

# Chapter 5: Response

## 5.1 Introduction

The previous chapter provided evidence of vulnerabilities in Caribbean countries to natural hazard impacts and over the past three decades. This provides a case for the provision of disaster risk reduction policies and strategies to reduce those vulnerabilities. Disaster risk reduction frameworks have been developed in recent decades to provide guidance to countries in reducing disaster risks.

This aim of this chapter is to examine the disaster risk reduction policies of Jamaica and Dominica from a political economy perspective. The first section will examine the existing DRR frameworks in order to determine the priority areas which will be used as a structure for the analytical section. Thereafter, an examination of the response for Jamaica and Dominica will be conducted, using these priority areas as a measure of progress in developing the DRR institutional framework.

## 5.2 Frameworks for DRR policies

The literature review recognised that there exists several frameworks for DRR policy implementation. Various international partners currently support these frameworks while some are outdated and no longer in use. Nevertheless, it is important for this study to examine the features of all existing frameworks to identify success factors.

In relation to Agriculture, mainstreaming DRR within key sectors appears to have found regional and international advocacy through agencies that have supported countries in the development and implementation of Agriculture DRR frameworks, plans and

strategies. Therefore this section will examine existing frameworks for DRR to highlight the important areas that can be used to identify successful DRR policies.

### 5.2.1 Examination of Selected Existing DRR Frameworks

#### Mitchell's multi-hazard DRR Mainstreaming Framework (2003)

In examining specific frameworks, a look at Mitchell's Framework shows that it focuses on DRR mainstreaming for building resilience to disasters. The framework consists of 20 indicators to be answered and subjectively graded by specific sources. Each indicator has primary and sub-indicators which are graded incrementally so that improvement leads to best practices in DRR. This is said to be a highly flexible and participatory process for national stakeholders. The priority areas for Mitchell's Framework are (1) Politics and Legislation, (2) Policy, (3) Knowledge and (4) Practice i.e. use of DRR measures. However, this framework lacks global recognition and is no longer supported.

#### ProVention's 'Measuring Mitigation' initiative

This framework focuses on the work of development organisations that execute development projects in hazard-prone countries to ensure that hazard risks are incorporated in their project design so that they do not create vulnerabilities, unintentionally (Benson and Twigg, 2004). ProVention's overall goal is aimed at risk reduction through: 1) *Building partnerships* and cooperation; 2) *Promoting* disaster risk management among senior government functionaries and policy makers; 3) *Developing and improving* the practice of disaster risk identification; risk reduction; and risk transfer/risk sharing; 4) *Knowledge and information sharing* about best practices, tools and resources for disaster risk management (World Bank, 2006).

It can be seen that these broad areas are similar to Mitchell's framework, however ProVention's was mainly designed for development partners rather than developing countries. While the ProVention Consortium is no longer being supported by its funding agencies, its work in the four major strategic areas has seen progress in DRR.

**IDBs Indicators of Disaster Risk and Risk Management**

This next framework aims to identify disaster risk factors which should be reduced through policy implementation and measures for vulnerability reduction so that the coping capacity within a country would be maximized when impacted by a natural hazard (Cardona, 2005). This framework, like those that were previously mentioned, is also outdated and no longer supported.

The main elements of vulnerability are grouped into four components or composite indicators (See Figure 5.1) which are used to show the level of risk reduction within a country. We can therefore summarise that the main elements within this framework that may suggest improved DRR are *reduced Economic and Financial vulnerability*, *improved social and environmental risk* at the sub-national level, *reduced vulnerability for disaster prone areas* and *improved national risk management capacities*.

Figure 5.1: Four components or composite indicators of Disaster Risk and Risk Management


Source: (Cardona, 2005)

**The United Nations Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030**

Finally, we examine the Sendai framework for Disaster Risk Reduction 2015-2030 which consist of seven targets and four priorities for action towards reducing disaster risks. This United Nations framework was adopted at the Third United Nations World Conference on Disaster Risk Reduction in 2015 and builds on the work started by the Hyogo Framework for Action (HFA) between 2005 and 2015.

The main priority areas of the SFDRR are *"1) Understanding disaster risk, 2) Strengthening disaster risk governance to manage disaster risk, 3) Investing in disaster risk reduction for resilience, and 4) Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction"* (UNISDR, 2015, p. 14).

Unlike the previously mentioned frameworks, the SFDRR is up-to-date, internationally accepted and endorsed and consists priorities and targets as well as indicators. This framework has also been linked to the work done by FAO in mainstreaming DRR within the Agricultural sector (See Box 5.1). This attribute is absent in other frameworks.

A matrix of selected DRR frameworks, as discussed above, highlighting common priorities can be seen in Appendix 2.

Box 5.1

The Food and Agriculture Organization of the United Nations (FAO) made a number of recommendations regarding priorities for the implementation of the Sendai framework for DRR in the Agriculture and Food and nutrition sector and these include the following:

1. *Understanding disaster risk in the agriculture and FSN sector*
2. *Strengthening risk governance in the agriculture and FSN sector*
3. *Investment in disaster risk reduction for the resilience of the agriculture and FSN sector*
4. *Improve effective preparation to respond and to "build back better" within the scope of recovery, rehabilitation and reconstruction in the Agriculture and FSN Sector*

Source: (FAO, 2017)

### 5.2.2: Identification of common characteristics for successful DRR implementation

The examination of selected DRR frameworks have revealed a number of common areas which have been recommended for successful DRR. These include the following:

- Priority Area 1: *Improved and strengthened disaster risk governance* and disaster management mechanism in which there are up-to-date legislation, policies and plans for disaster risk reduction at all levels of government with communication, coordination and participation of all stakeholders.

- Priority Area 2: *An understanding of what constitutes disaster risk* in various sectors of society and how it can be managed with information and knowledge sharing.

- Priority Area 3: *Improved practice of disaster risk reduction* ensuring that countries have learnt from and improved their disaster response and recovery efforts.

- Priority Area 4: *Improved access to funding* for disaster risk reduction

These results have strong comparisons with the priority areas used by other countries that have completed similar studies. These areas will therefore be used to examine the effective implementation of DRR in Jamaica and Dominica within the remaining sections of this chapter.

### 5.3 Improved and strengthened disaster risk governance

Given the recent hurricane impacts on Jamaica and Dominica, expectations were that there would be consequential developments in the DRR governance framework for various subsectors. A FAO study had identified Jamaica as one of the six countries with plans in place to address hazards in agriculture while Dominica was among countries with no plans at all (FAO, 2013).

Quite recently, Dominica has been implementing Climate-smart agriculture (CSA) with the preparation of a National Resilience Development Strategy (NRDS) 2030 and

participation in a number of projects supported by international partners at various levels (Green Climate Fund, 2018). There is recognition, however, of the importance of improving and strengthening disaster risk governance in these countries and within the agriculture sector.

### 5.3.1 Legislation, Policies and Plans

**Table 5.1: Political Economy Analysis of the DRR legislative framework for Dominica**

| National Legislation, Policy or Plan | Year | Includes Institutional Framework for DRR? | Includes DRR Strategies for the Agriculture Sector? | Includes localisation of DRR? | Includes funding of DRR activities? | Includes Public Information and Education activities? |
|---|---|---|---|---|---|---|
| **Dominica** | | | | | | |
| **Legislation** | | | | | | |
| The Constitution, No. 1027 of 1978 | 1978 | No | No | No | No | No |
| Emergency Powers Act 1987 | 1987 (rev 1990) | Yes | No | No | No | No |
| **Policies and Plans** | | | | | | |
| National Disaster Management Policy/ Plan | 2001 Rev. 2009 | Yes | Yes | Yes | Yes | Yes |
| Dominica's Low-Carbon Climate Resilient Development Strategy | 2012–2020 | No | Yes | Yes | Yes | No |

**Source: Authors own construct**

In relation to the legal framework, we take this term as synonymous with the formal mechanisms for disaster risk reduction. The table above summarises the extent to which these formal mechanisms included provision for DRR in Dominica. The review found that Chapter 15:03 of the **Emergency Powers Act 1987** (rev 1990) seemingly indicates political commitment for disaster risk management as it empowers the President to "make orders that would ensure the safety and security of the people".

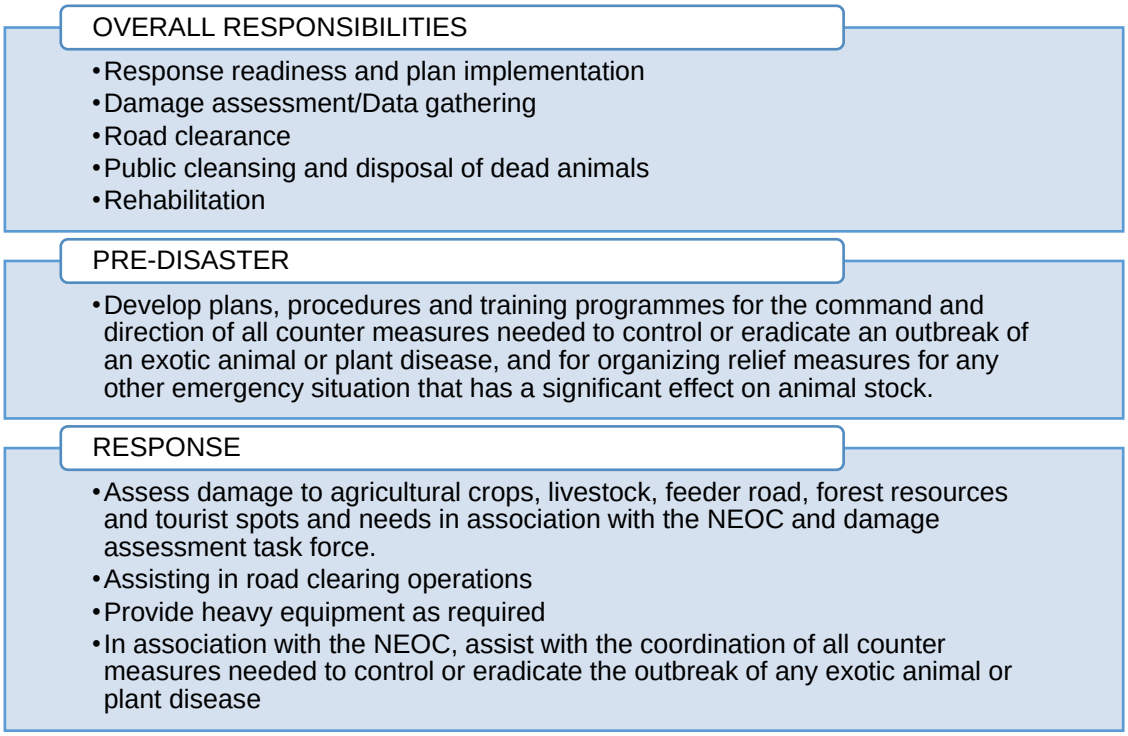
It is believed that this order has been responsible for the development of key policies and plans such as the National Disaster Management Policy (NDMP) and Plan of 2001, which was created specifically for disaster management and include policy documents to guide disaster prevention, mitigation, preparedness, response and recovery. The NDMP states that:

> *"It is the resolve of the Government of Dominica that, in the light of traditional and emerging threats from natural and man-caused disasters, Disaster Management is to be given the highest level of authority and be adequately resourced, so as to ensure the protection and safety of the people and assets of the country, the sustainability of our social and economic progress and our future survival as an independent nation".*
>
> (NEPO, 2001, p. 2)

The most recent revision of this plan occurred in 2009. This seems to indicate that a legislation is not required for DRR. It also shows the existence of political will for DRR, as recommended by the Sendai framework, through '*establishment and coordination of national and local platforms for disaster risk reduction*' (UNISDR, 2015).

Turning now to the agriculture sector, the National Disaster Plan outlines the responsibilities of the Ministry of Agriculture before and after a disaster event and their expected responses as seen in Figure 5.2. This response is very limited in that it makes no mention of DRR measures to be undertaken in this sector to reduce the impact of natural hazards. Dominica's Low-Carbon Climate Resilient Development Strategy, however, does include strategies for Climate Resilience as well as DRR in the Agricultural Sector under the Climate Resilient Development Pathway Component 1 – "*Promotion of Food Security through Climate Resilient Agricultural/Fisheries Development"* (Commonwealth of Dominica, 2012b).

Figure 5.2: Responsibilities for Ministry of Agriculture as outlined in the National Disaster Plan, Dominica




*Source:* (NEPO, 2001, p. 50).

**Jamaica**

**Table 5.2: Political Economy Analysis of the DRR legislative framework for Jamaica**

| National Legislation, Policy or Plan | Year | Includes Institutional Framework for DRR? | Includes DRR Strategies for the Agriculture Sector? | Includes localisation of DRR? | Includes funding of DRR activities? | Includes Public Information and Education activities? |
|---|---|---|---|---|---|---|
| **Jamaica** | | | | | | |
| **Legislation** | | | | | | |
| The Constitution | 1962 | No | No | No | No | No |
| The Emergency Powers Act (EPA) | 1938 | No | No | No | No | No |
| Disaster Preparedness and Emergency Management Act (Repealed)<br><br>National Disaster Risk Management Act | 1993<br><br>2015 | Yes | Yes | Yes | Yes | Yes |
| **Policies and Plans** | | | | | | |
| National Hazard-risk Reduction Policy | 2005 | Yes | No | Yes | No | Yes |
| The National Development Plan of Jamaica "Vision 2030" | 2030 | Yes | Yes | Yes | Yes | Yes |

**Source: Authors own construct**

In contrast to Dominica, Jamaica established the Disaster Preparedness and Emergency Management Act in 1993, which was repealed by the National Disaster Risk Management Act of 2015. This legislation established the emergency management body, the Office of Disaster Preparedness and Emergency Management (ODPEM) and outlined its responsibilities and functions, which includes the development of the National Disaster Risk Management Plan. It states that:

> *"There is hereby established for the purposes of this Act, a body to be called the Office of Disaster Preparedness and Emergency Management… [whose] functions shall include… encouraging and supporting disaster preparedness and*

*mitigation measures in all parishes in collaboration with local authorities, community-based organizations and nongovernmental organizations respectively."*

(The Government of Jamaica, 2015, pp. 6–8)

This is in stark contrast to the situation in Dominica in which the national disaster organisation and plan was initiated by a policy rather than legislation.

Regarding the Agriculture sector, while the National Disaster Risk Management Act 2015 does not mention the sector specifically, it does establish responsibilities for the Ministry of Agriculture. This is unlike the situation in Dominica which only assigned responsibilities for the Ministry of Agriculture in the event of a Disaster.

**Policy**

Looking now to policy interventions, data compiled shows that a National Hazard-risk Reduction Policy (2005) was developed for Jamaica which aims at establishing a programme for hazard risk reduction.

Additionally, the National Development Plan of Jamaica, "**Vision 2030 Jamaica**", includes as one of its national outcomes "*hazard risk reduction and adaptation to climate change*", which contains four specific National Strategies. Jamaica aims to "improve resilience to all forms of hazards; develop measures to adapt to climate change; contribute to the effort to reduce the global rate of climate change; and improve emergency response capability" (PIOJ, 2009).

Further, the disaster risk management plan for the agriculture sector (ADRM) was developed in 2009 by the Ministry of Industry, Commerce, Agriculture and Fisheries (MICAF) Jamaica to reduce the impact of natural hazards on agricultural livelihoods (FAO, 2013). Recently, in collaboration with the FAO, the ADRM framework and strategy was updated for Jamaica as a number of gaps were identified such as monitoring issues, unclear responsibilities, structures and roles and inadequate linkages with national mechanisms (FAO/RADA, 2019). The Rural Agriculture Development Authority (RADA) of Jamaica has responsibility for DRM in the Agriculture sector and operates under MICAF (FAO/RADA, 2019).

### 5.3.2 Institutional arrangements

Having discussed the legislation for DRR in Jamaica and Dominica we examine the institutions that were established for DRR. Good institutional arrangements are essential to ensure implementation of DRR policies.

#### Dominica

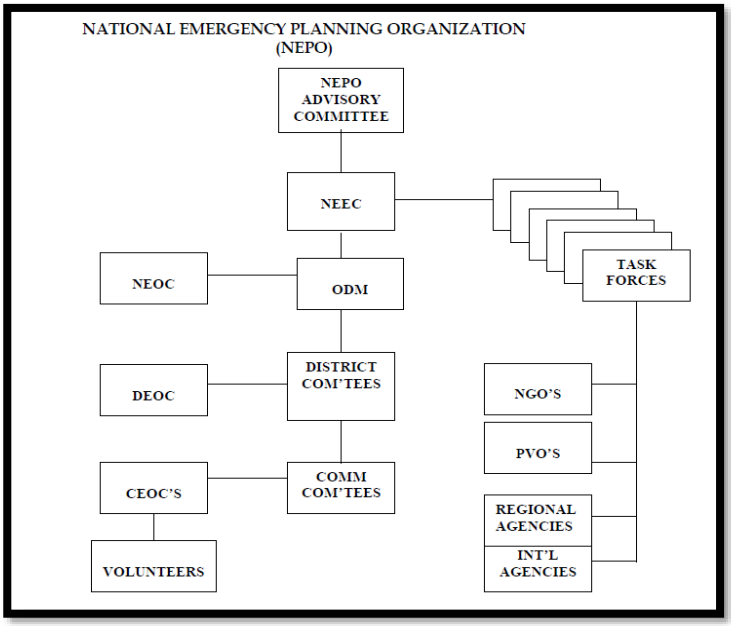
For Dominica, disaster management occurs at the national, parish and community levels. The National Disaster Plan 2001 established a number of key structures and institutions for disaster management and outlines the roles and responsibility of all stakeholders. Table 5.3 summarises the main institutions for disaster management established by the National Disaster Plan.

**Table 5.3: Institutions established by the National Disaster Plan 2001 in Dominica**

| Agencies and Committees | Chairperson/ Head | Responsibility |
|---|---|---|
| National Emergency Planning Organization (NEPO) | The Prime Minister | Planning and coordinating the management of disasters in the country |
| National Emergency Executive Committee (NEEC) | The Prime Minister | Oversee the management of its Secretariat, the ODM and the NEOC (activated when there is an emergency) |
| Office of Disaster Management (ODM) | Coordinator | Secretariat and implementation unit of NEPO |
| District Emergency Committees (DEC) | District Chairmen (7) | (1) Providing advice and assistance in implementing disaster preparedness measures<br>(2) Monitoring, on a continuous basis, existing disaster arrangements in his or her District |

The structure for disaster management in Dominica can be seen in Figure 5.3.

Figure 5.3: The structure of Political and Institutional arrangements for Disaster/ Emergency Stakeholders in Dominica.




**Source:** (NEPO, 2001)

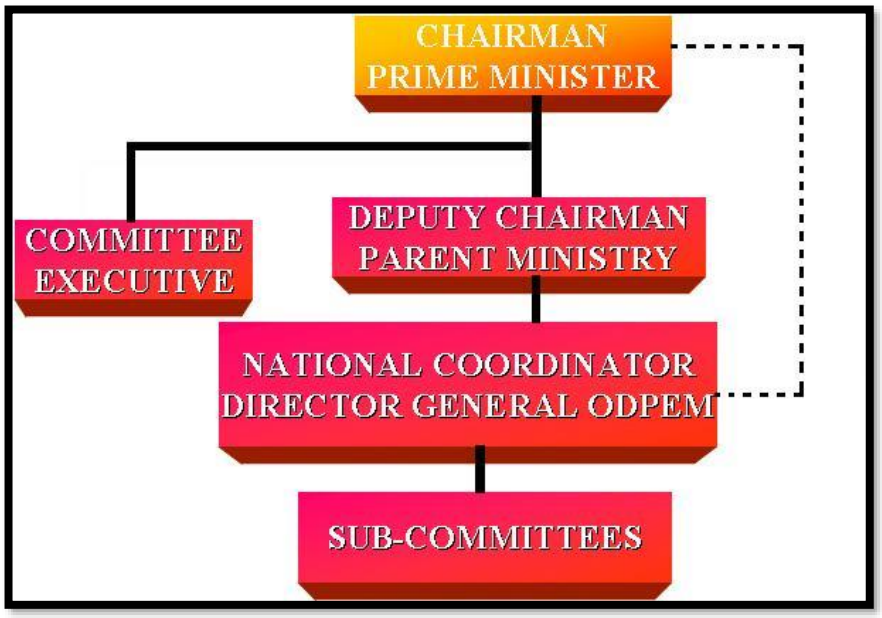
**Localisation**

The synthesised Table 5.3 outlines the actors and their responsibilities at the district level in relation to disaster preparedness measures. Moreover, there also exists a Community Disaster Programme to build capacity in response to disasters and to develop local response mechanisms at the community level. According to the National Disaster Plan (2001), training would be conducted at this level on how to reduce damage to protect themselves from hazards.

**Jamaica**

Similarly, the DRR institutional framework of Jamaica is organised into a four-tier structure which operates at the national, regional, parish and community levels and its actions are set out in the National Disaster Plan (1997). Figure 5.2 illustrates the political and organisational structure of DRR in Jamaica and Table 5.4 shows the institutions which were established for DRR.

Figure 5.2: The structure of Political and Institutional arrangements for Disaster/ Emergency Stakeholders in Jamaica




Source: (ODPEM, 2019)

At the national level, Jamaica has established a National Disaster Committee (NDC) and six (6) sub-committees with the Prime Minister as Chairman of the NDC having overall responsibility for disaster preparedness and management. The sub-committees are composed of members of the public and private sectors, NGOs and donor organisations who contribute to the policy and planning processes. The NDC meets once annually in order to review the disaster policy.

While the National Disaster Plan does not include DRM for the Agriculture Sector, specifically, Jamaica has had an ADRM plan in existence since 2009. This plan was recently revived with assistance from the FAO as implementation was preliminary only and it required strengthening with unambiguous roles and responsibilities (FAO, 2013). ADRM is implemented through a National committee with a framework and strategy which is driven by the Rural Agricultural Development Agency (RADA) (FAO/RADA, 2019).

Similar to the DRM framework, the ADRM institutional framework is organised at the regional, national, parish and local levels.

**Table 5.4: Institutions established by the National Disaster Risk Management Act 2015 in Jamaica**

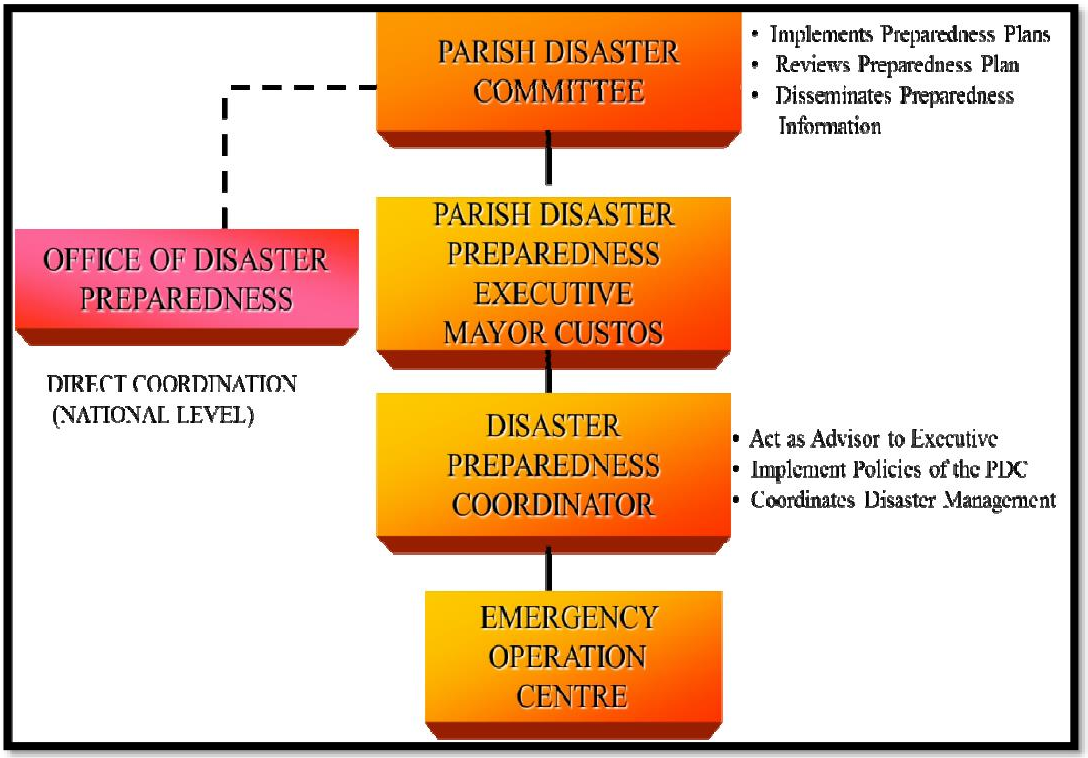
| Agencies and Committees | Chairperson/ Head | Responsibility |
|---|---|---|
| Office of Disaster Preparedness and Emergency Management (ODPEM) | Director General/ National Disaster Coordinator | Secretariat and implementation unit of the NDC |
| National Disaster Committee (NDC) | The Prime Minister | Approve disaster policy matters<br><br>Oversee the management of its Secretariat, the ODM and the NEOC (activated when there is an emergency) |
| National Disaster Risk Management Council | The Prime Minister | Disaster preparedness and management |
| Committees of the Council (7) | Various Ministries, agencies and the ODPEM | Equip, finance and staff disaster management agencies;<br>Conduct damage assessment;<br>Law enforcement, rescues and emergency transport;<br>Disaster management information and training; and<br>Coordinate Emergency Health |
| Parish Disaster Committees (PDCs) | Custos and Mayor of Parish<br><br>Parish Disaster Coordinator | Disaster management and disaster operations in the parish;<br>Reviewing and assessing disaster management plans and activities;<br>Community awareness of disaster prevention and preparedness; and<br>Coordination of resources etc. |
| Zonal Committees | Zonal Chairman | Public Education regarding disaster preparedness and emergency response;<br>Coordinate activities with PDC; and<br>Appoint shelter managers; etc. |

Source: Authors own construct

**Decentralization**

DRR at the Parish level is implemented by Parish Disaster Committees (PDCs), with coordination from the ODEPM and headed by the Custos and Mayor of the parish. Each parish also engages a Parish Disaster Coordinator with responsibility for disaster management and the formulation of a Disaster plan that is specific to the needs of the Parish and within the guidelines of the ODEPM. An Emergency Operations Center also operates out of the Parish Council Office. Figure 3 illustrates the institutional arrangement for Parish level DRM in Jamaica.

Figure 5.3: Parish Level Institutional Arrangement for DRR in Jamaica



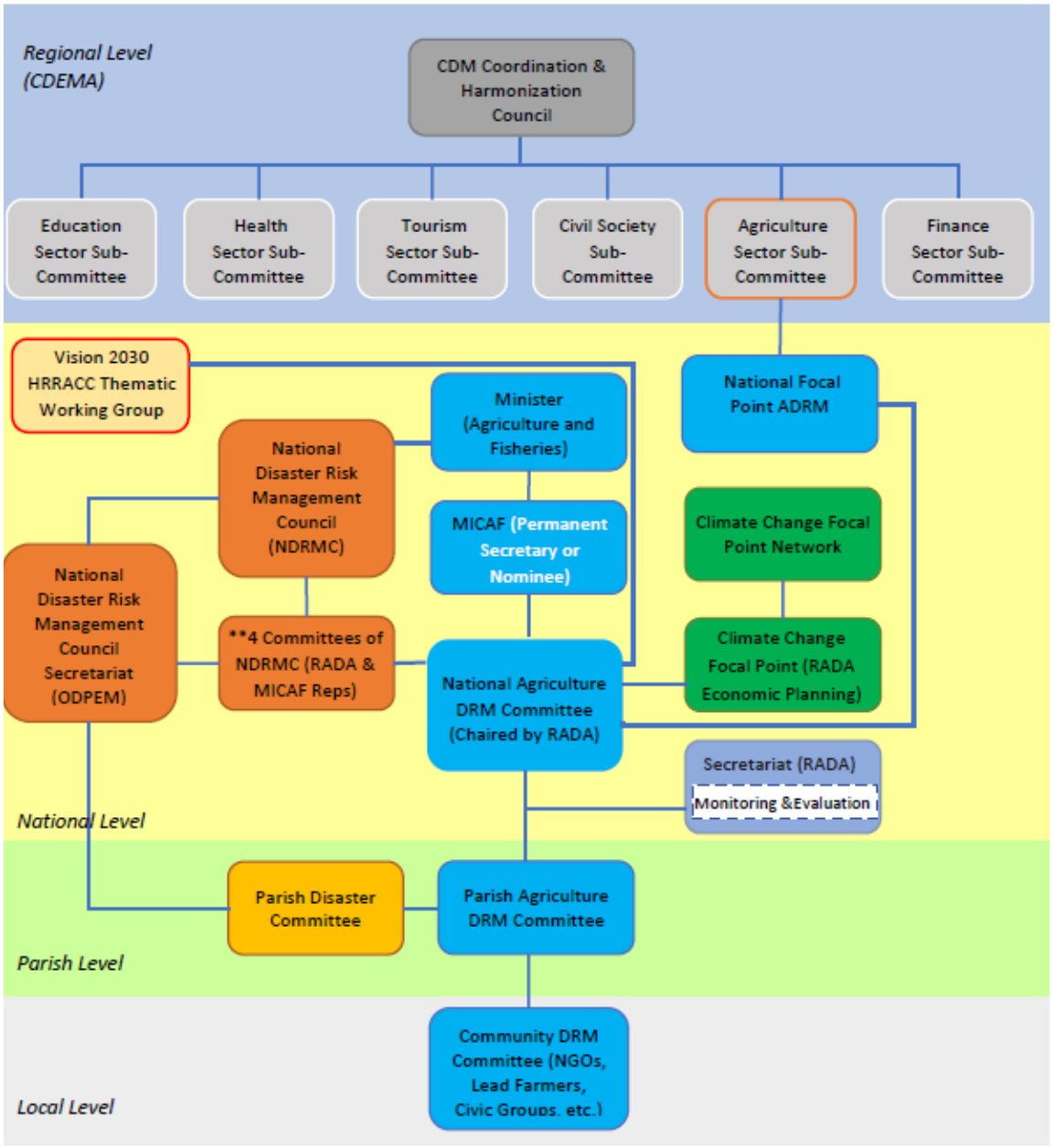

Source: (ODPEM, 2019)

Regarding the Agriculture sector, ADRM is implemented at the Parish level through the Parish Agriculture Disaster Risk Management (PADRM) committee consisting various agriculture sector stakeholders. The PADRM committee chairperson is a member of the

PDC and therefore provides a linkage with this grouping. Additionally, the PADRM reports to the national ADRM and can attend these meetings if so required.

Furthermore, at the community level a National Zonal Programme was developed to enable communities to cope with a disaster for 72 hours before external assistance arrives (ODPEM, 2019). The zonal chairman provides information relating to disasters to Parish Disaster Committees (PDCs) and arranges for resources to be dispatched when required. The National Zonal Programme is coordinated by a National Zonal Committee with responsibility for programme monitoring, public education, fundraising and communicating the mission of the programme.

Figure 5.4: Structure of the Agriculture Disaster Risk Management Institutional Framework of Jamaica




Source: (FAO/RADA, 2019)

## Analysis

Most DRR frameworks identified in the previous chapter have included the importance of a legal and regulatory framework for DRR. The Sendai Framework for Disaster Risk Reduction, in particular, has recognised that there should be greater focus on reviewing

and strengthening legal frameworks. According to Llosa and Zodrow (2011), legislation serves an important function of empowering agencies and institutions at the national and local levels to respond in an effective and accountable manner.

There is also recognition at the international level that well-developed legislation and policies create an enabling environment for the reduction of disaster risks due to natural hazards (IFRC and UNDP, 2014). Using the 2015 International Federation of Red Cross and Red Crescent Societies (IFRC) and the United Nations Development Programme (IFRC-UNDP) typology of DRM laws, legislation in Dominica can be categorised as one which prioritises emergency response to natural hazard events rather than the key DRM functions, while Jamaica's legislative arrangements appears to prioritise DRR. Moreover, the 2001 National Disaster Plan of Dominica is seemingly the driver of DRR rather than legislation.

With regards to the institutional arrangements, Dominica seems to utilize a top-down approach to the management of disasters with local level coordinators providing feedback to the national coordination body regarding the capacity at that level. The arrangement for Dominica appears to prioritise disaster response and coping strategies rather than DRR.

An additional weakness in institutional arrangements for Dominica was noted in sectoral taskforce. Government officers assigned to these taskforce appear to conduct their duties in addition to regular work, which may result in lack of progress due to lack of incentives to implement DRM.

The institutional arrangement as laid out in the NDP does not specify plans for the Agriculture sector. However, a source indicated that a draft revised ADRM Plan exists for Dominica which was prepared by the Ministry of Agriculture, Food and Fisheries (MOAFF) with assistance from the United Nations agencies.

In comparison, Jamaica's DRR and ADRM plan has been touted as one of the most comprehensive (FAO/RADA, 2019) and are notably linked with a similar structure. There are clear lines of communication and reporting as well as the inclusion of a monitoring mechanism which has also been acknowledged as critical to successful DRR. The importance of local level engagement in DRR has been firmly acknowledged as a successful approach to reducing disaster risks (UNISDR, 2015) and understanding what contributes to those risks and vulnerabilities at the level of impact rather than on the event (Wisner *et al.*, 2004).

Despite the acknowledged progress of ADRM in Jamaica, gaps and weaknesses have however been identified with the ADRM structure including issues of lack of detailed financing strategy, absence of terms of reference, composition of national committee lacking critical stakeholders, etc. (FAO/RADA, 2019).

### 5.4 An understanding of what constitutes disaster risk

The institutional frameworks of Dominica and Jamaica appears to acknowledge the importance of providing information to its citizens about disaster risks, preparedness and coping strategies. The Dominica NDP 2001 includes that:

> *"The National strategy for combating disasters is to continuously educate and inform the general public and emergency service agencies about disaster management issues".*

(NEPO, 2001, p. 4)

Meanwhile the main DRR legislation for Jamaica assigned responsibility to the ODPEM in relation to public education and awareness campaigns and includes the following:

> *"The Director General shall conduct programmes of public information and education on the mitigation of, preparedness for, response to and recovery from, emergency situations and disasters"*
>
> (The Government of Jamaica, 2015, p. 10)

In Jamaica, the public information programme is also delegated to Zonal Committees.

In practice however, respondents in both countries alluded to a deficit in risk information with more focus provided by government on disaster preparedness rather than how citizens can contribute to reducing risks. There was also a call for more training for stakeholders in the risk management process. This confirms with information stated in the literature review in relation to information gaps which result in the failure of government to implement successful DRR.

Further it was also noted, in the literature review, that information gaps which impacted successful DRR policy included the lack of knowledge regarding risks whereas, DRR was understood to involve the increasing risk knowledge. A source from Jamaica indicated that the main disaster agency had implemented a project, "*Building Disaster Resilient Communities (BDRC)*", for the period 2009-2012 which sought to increase community information and awareness about DRR through trainings, community structures and strengthening partnerships. This evidence supports that Jamaica has been addressing information asymmetries which may affect the successful implementation of DRR policy.

### 5.5 Improved practice of disaster risk reduction

In relation to the practice of DRR, over the past decade countries appear to have made efforts to improve their preparation, recovery and response to the impact of natural hazards. The policies examined in this chapter provided some evidence of better coordination through the national systems and involvement and participation from stakeholders at the community level. As identified in the literature review, coordination problems can affect successful DRR policy implementation as well as ineffective decentralization.

In practice, the respondent in Dominica indicated that collaboration among agencies in the country worked well as the country is small and the same officials would regularly attend the same meetings. Within Jamaica, one respondent indicated that there was need for stronger collaboration among agencies and that there were instances where DRR projects were implemented without their knowledge or input.

Regarding localisation, the review of institutional arrangements in the previous sections show that there has been greater local level participation through the formal institutional structures which were developed in both countries. This appears to work well in Jamaica with the added benefit of some level of financial autonomy at the lowest level, Zones, as the evidence shows that they also raise their own funds. On the other hand, in Dominica, local level structures were found to be fully dependent on the Office of Disaster Management for funding.

### 5.6 Improved access to funding

In relation to the funding of DRR activities, both countries have made provisions in their institutional arrangements and this indicates that there is some recognition of the need to allocate national funds for disaster recovery and preparedness as well as for DRR. In Jamaica, the DRM Act 2015 makes provision for the establishment of a National Disaster fund while for Dominica, the 2001 National Disaster Plan includes the establishment of a Disaster Relief Fund which is managed by the Minister of Finance. This evidence further indicates that disaster management rather than DRR is being pursued since there appears to be no provisions for the funding of DRR activities in the NDP. Instead, evidence indicates that there may be an overreliance on external funding for DRR activities.

In practice, however, countries have traditionally relied heavily on donor funding for DRR activities. It was noted in the literature review that competing priorities for government funds constrain the provision of DRR goods. Consequently, a respondent from the Disaster management agency of Jamaica related that DRR financing is obtained from the following sources:

- *The Government of Jamaica;*
- *Donor funding*
- *Agency budgets;*
- *National Disaster Fund – supports national recovery efforts;*
- *Private Sector – funds allotted for private sector DRR projects; and*
- *Sectors (e.g. Agriculture, Tourism, Housing etc.)*

This stream of diversified financing could possibly indicate that there is a change in practise from the traditional ways of financing and that Jamaica is learning from the experiences of previous events. The situation in Dominica on the other hand reveals continued dependence on donor funding for DRR related activities. It appears that successful DRR would entail a diversified stream of income for DRR activities rather than high dependence on donor support.

### 5.7 Summary

In summary, this chapter has critically examined the institutional arrangements for DRR in Jamaica and Dominica using the political economy analysis and priority areas from existing DRR frameworks to structure the discussion. It also examined whether countries have developed institutional arrangements for agricultural DRR at various levels.

What has emerged is that despite the importance of the agriculture sector to the region and its vulnerabilities, the region is still in an early stage of mainstreaming. Regarding DRR however, there appears to have been some successes within the priority areas identified, despite that the effects are currently immeasurable. These will be discussed in the final chapter of this research.

# Chapter 6: Discussion and Conclusion

## 6.1 Introduction

This study set out to assess the effective implementation of DRR policies, with specific emphasis on the agricultural sector, of Jamaica and Dominica using the institutional factor of the political economy analysis. Additionally the study employed the use of priority areas from existing DRR frameworks in order to conclude on the best practices, which could be used to strengthen or inform the development of DRR policies in the Caribbean region.

This chapter presents the main findings of the research discussion organised by the objectives of this study. Following this will be sections discussing the implications of this research for policy, future research and limitations of results. Section 6.6 will present the major conclusions of this research.

## 6.2 Main Findings by Objectives

### 6.2.1 To critically examine DRR policies in Jamaica and Dominica

The evidence presented suggests that the institutional arrangements that exists for Dominica might be more focused on disaster response and preparedness rather than on reducing disaster risks. This was identified by the institutionalisation of DRR in Dominica by the National Disaster Plan 2001, which appears to lack power to effect change; whereas the Disaster Risk Management Act 2015 provides for the establishment of the institutional framework for disaster risk reduction in Jamaica. It appears that legislation is not necessary for the implementation of DRR policy in Dominica.

Moreover, in relation to mainstreaming in the agriculture sector, Jamaica has had an agriculture disaster risk management (ADRM) plan since 2009 which had to be revived in 2019 since it contained a number of gaps. Dominica on the other hand has a draft policy, which has not been adopted. Nevertheless, Dominica has included some ADRM measures in its LCDS. Despite this strategy, it can be seen that Dominica has been lagging behind other countries in relation to ADRM.

It also appears that coordination is successful in Jamaica since the relevant institutions are oftentimes present on committees at the lowest level as well as on the National Council (see section 5.4 for more details). Dominica on the other hand appears to employ a top-down approach, as mentioned in the assessment of section 5.3, which lacks DRR strategies.

Furthermore, an examination of DRR funding within the legislative arrangements revealed that despite evidence of a Disaster Fund in legislations, there remains a heavy dependence on external financing for Dominica. It should be acknowledged, however, that the economic situation in Dominica, with high poverty rates (see Chapter 4 for more details), might have competing priorities for government funds as indicated in the literature review.

Additionally, evidence of better coordination in disaster policy was provided given the assignment of roles and responsibilities for the various actors in DRR at all levels.

Nevertheless, there were cases where some agencies were not involved in DRR projects in Dominica and in the case of Jamaica, an ADRM committee was found with the following issues: monitoring issues, unclear responsibilities, structures and roles and inadequate linkages with national mechanisms. Literature does indicate that these issues will arise in multi-agency collaborations and that there is need to understand power dynamics. These results suggests that countries should ensure that the roles and responsibilities of the various actors in DRR at the different levels are well documented and reviewed at different intervals.

### 6.2.2 To analyse and compare effective implementation of DRR policies in Jamaica and Dominica

It was concluded from the examination of existing DRR frameworks that the four major characteristics of effective DRR policy implementation were likely *an improved and strengthened disaster risk governance*, *an understanding of what constitutes disaster risk*, *improved practice of disaster risk reduction,* and *improved access to funding for disaster risk reduction.* These characteristics were notably similar to the FAO's priorities for the Agriculture and food and nutrition sector (See Box 5.1 for more details).

While the evidence from the research revealed that Jamaica could be considered relatively more effective in DRR policy implementation than Dominica, there were a number of deficiencies in each of the major characteristics determined that were discussed in Chapter 5. Key findings include deficiencies in institutional arrangements in Jamaica (in relation to communication among actors in the agriculture sector of DRR activities implemented), lack of legislative framework for Dominica, a lack of disaster risk knowledge, and being heavily depended on external financing for DRR activities.

Furthermore, DRR experts lamented that the underlying cause of poor DRR policy implementation in both countries is a lack of understanding and appreciation of DRR risks beyond the legislation and policy in every sector and for each individual. This can be categorised as an information gap which was noted in the literature review as a process that may hinder the implementation of DRR policies. One possible explanation for some of these deficiencies could be the continued focus on disaster preparedness and response, or the hazard paradigm, rather than disaster risk knowledge which should be introduced in each sector of society.

### 6.2.3 To highlight from evidence best practices for the development of DRR policies to CARICOM SIDS who are also vulnerable to disaster risks.

This section follows from the previous section in which there was reflection on the main elements from existing DRR frameworks that could be used to analyse and compare effective implementation of DRR policies in Jamaica and Dominica. While the findings of this study were mixed, in that there seems to be no clear evidence of effective DRR policy implementation (particularly in terms of reduced disaster impacts), some evidence of best practices for DRR policy implementation were found.

**Best Practice 1: A dedicated DRR Act which focuses on disaster risk reduction rather than disaster management with provisions for DRR.**

For the DRR mainstreaming within major sectors, legislation is likely to show evidence of high prioritisation by government and could possibly strengthen institutional arrangements for its implementation. This legal document should also contain the roles

and responsibilities for all actors in DRR and the establishment of DRR committees at the lowest level in the country. A clear outline of the lines of authority would reduce issues of coordination among agencies as there would be awareness of each other's activities within the DRR framework. These best practices in relation to the legal framework are consistent with the findings of the IFRC and UNDP (2015) "*Checklist on Law and Disaster Risk Reduction*".

**Best Practice 2: Diversified funding for DRR activities**

Evidence shows that a diversified funding stream is more viable than almost complete dependence on external donors with competing use of funds. Countries could also ensure that the DRR laws contain, if possible, budget appropriations for DRR activities, rather than disaster relief only (and in major sectors as well), which is likely to improve the enabling environment for DRR.

**Best Practice 3: A policy for the identification and assessment of risks in all sectors of the economy and at all levels.**

From these results, DRR should be incorporated in all relevant policies and plans. This could possibly result in changes to existing policies, such as education policy, whereby DRR education would likely be included in the curriculum of all educational institutions. This call for DRR incorporation in policies at all levels, simply reinforces what is already being highlighted by DRR experts and in discussions of this area.

### 6.3 Implications for Policy

An important implication of these results is that having a legal framework for disaster risk reduction matters, since it empowers the agencies it establishes, as opposed to a policy, which does not impose a penalty for non-cooperation. Additionally, this research has found that there is a lack of appreciation and understanding for disaster risk in relation to the participation of all citizens of a country. This has implications for the revision of educational policy to incorporate disaster risks in educational curriculum.

Perhaps the important implication in these findings is possibly that DRR policies, as well as mainstreaming within the agricultural sector, should be strengthened in Caribbean countries, as their current impacts (in terms of reducing vulnerability, achieving climate change goals and sustainable development outcomes or food security) are indeterminable.

### 6.4 Future Research

Further research on the implementation of DRR policies is critical for Caribbean countries as a number of instruments are currently being developed or revised in order to guide governments in the reduction of the negative impacts of natural hazards. These impacts have hindered their ability to achieve sustainable development and contributed to increasing vulnerabilities of the poor.

Future research should therefore entail in-depth examination of DRR policy implementation - in the countries rather than remotely. Additionally, qualitative methods could be employed such as focus group discussions with farmers and community level

stakeholders in DRR, workshops and in-depth interviews with stakeholders at all levels. This will create a better understanding of the issues regarding disaster risks within the countries and whether the current policies have effected change with respect to reducing hurricane impacts.

### 6.5 Limitations of Results

It is important to highlight that several limitations might have potentially affected the quality of these research findings and the researcher's ability in effectively responding to the research questions.

In the first instance, the researcher was constrained by the word limit, which might have compromised the depth of discussion into deeper issues such as community level implementation, sustainable development, climate change adaptation and food security. This type of study would have likely produced more impactful outcomes if it was conducted by an expert researcher.

With regards to the study design, it was recognised that the number of countries used to answer this research question may have been too small to draw conclusions. Additionally, this research could have gained from face-to-face interviews with DRR experts and a more experienced researcher to extract and utilize the rich data, which emerged from this experience.

It is probable therefore that the findings of this research could have been richer if there was greater access to research personnel and documents. There was some difficulty accessing relevant personnel to obtain information possibly due to lack of information on the current staff and relevant agencies. This could be overcome with on-the-ground implementation of this type of research.

### 6.6 Conclusion

This study set out to assess the effective implementation of disaster risk reduction policies in Jamaica and Dominica, with specific focus on the agricultural sector in order to conclude on best practices, which can be used to inform the implementation of similar policies in Caribbean countries that are vulnerable to natural hazards.

This discussion was very important for the Caribbean region as countries are impacted by natural hazards related to hurricanes, annually, and it has been recognised that governments are responsible for implementing effective DRR policies to protect the vulnerable citizens. Additionally, within the past decade Caribbean countries have been faced with the growing realities of climate change and its heavy economic, social and environmental cost, which are sometimes greater than the annual GDP of their economies and have great impacts on the large agricultural sector.

Despite the growing level of awareness by governments, the evidence shows that there have been little tangible results. The factors that were identified as hindrances to the implementation of DRR policies were similar to that which was presented in the literature review.

Nevertheless, the study has identified best practices in the implementation of DRR policies within Jamaica and Dominica. These include having a dedicated legislation with institutional arrangements for DRR, budget appropriations for DRR activities and clear roles and responsibilities for all actors in DRR. It is also recommended that policymakers should include disaster risk knowledge in education institutions to highlight its importance in at-risk countries.

The main limitations for this research were the word count limit, limited number of countries for this type of study and lack of access to government personnel and documents. Notwithstanding these limitations, this study adds to our understanding of the factors hindering or supporting the implementation of DRR policies and those specific to the agricultural sector in the Caribbean region.

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# Appendices

## Appendix 1

### Chart of the Sendai Framework for Disaster Risk Reduction
2015-2030

**Scope and purpose**

The present framework will apply to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors

**Expected outcome**

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

**Goal**

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience

**Targets**

- Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015
- Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015
- Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030
- Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
- Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020
- Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
- Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030

**Priorities for Action**

There is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas.

**Priority 1**
Understanding disaster risk

Disaster risk management needs to be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment

**Priority 2**
Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is vital to the management of disaster risk reduction in all sectors and ensuring the coherence of national and local frameworks of laws, regulations and public policies that, by defining roles and responsibilities, guide, encourage and incentivize the public and private sectors to take action and address disaster risk

**Priority 3**
Investing in disaster risk reduction for resilience

Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation

**Priority 4**
Enhancing disaster preparedness for effective response, and to «Build Back Better» in recovery, rehabilitation and reconstruction

Experience indicates that disaster preparedness needs to be strengthened for more effective response and ensure capacities are in place for effective recovery. Disasters have also demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of the disaster, is an opportunity to «Build Back Better» through integrating disaster risk reduction measures. Women and persons with disabilities should publicly lead and promote gender-equitable and universally accessible approaches during the response and reconstruction phases

**Guiding Principles**

- Primary responsibility of States to prevent and reduce disaster risk, including through cooperation
- Shared responsibility between central Government and national authorities, sectors and stakeholders as appropriate to national circumstances
- Protection of persons and their assets while promoting and protecting all human rights including the right to development
- Engagement from all of society
- Full engagement of all State institutions of an executive and legislative nature at national and local levels
- Empowerment of local authorities and communities through resources, incentives and decision-making responsibilities as appropriate
- Decision-making to be inclusive and risk-informed while using a multi-hazard aproach

- Coherence of disaster risk reduction and sustainable development policies, plans, practices and mechanisms, across different sectors
- Accounting of local and specific characteristics of disaster risks when determining measures to reduce risk
- Addressing underlying risk factors cost-effectively through investment versus relying primarily on post-disaster response and recovery
- «Build Back Better» for preventing the creation of, and reducing existing, disaster risk
- The quality of global partnership and international cooperation to be effective, meaningful and strong
- Support from developed countries and partners to developing countries to be tailored according to needs and priorities as identified by them

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The United Nations Office for Disaster Risk Reduction

(UNISDR, 2019)

**Appendix 2**

**Matrix of existing DRR Frameworks highlighting common characteristics for successful DRR policies**

| Mitchell's multi-hazard DRR Mainstreaming Framework (2003) | ProVention's 'Measuring Mitigation' initiative | IDB's Indicators of Disaster Risk and Risk Management | The Sendai Framework for Disaster Risk Reduction 2015-2030 |
|---|---|---|---|
| Politics and Legislation | Promoting disaster risk management among senior government functionaries and policy makers | Improved national Risk management – Institutional Framework; Governance and financial protection | Strengthening disaster risk governance |
| Policy | | | |
| Knowledge | Knowledge and information sharing | Improved national Risk management - Risk Identification | Understanding disaster risk |
| Practice | Developing and improving the practice of disaster risk | Improved national Risk management – Risk Reduction and Disaster Management | Enhancing preparedness for effective response and 'building back better' in recovery |
| | | Improved national Risk management – Governance and financial protection | Investing in disaster risk reduction for resilience |
| | Building Partnerships and Cooperation | Improved social and environmental risk at the sub-national level | |
| | | Reduced Economic and Financial vulnerability | |
| | | Reduced vulnerability for disaster prone areas | |

Source: Authors own construct

**Appendix 3**

## INTERVIEW GUIDE

## AN ASSESSMENT OF THE IMPLEMENTATION OF DISASTER RISK REDUCTION POLICIES IN THE AGRICULTURAL SECTOR OF JAMAICA AND DOMINICA

Introduction

### Basic Information

Could you describe the work of the institution with reference to DRR?

### DRR Implementation

What is your opinion on the status of implementation of DRR policy?

What do you think are the major challenges to the implementation DRR policy?

Can you tell me some possible solutions for these challenges?

What are some best practices to the implementation DRR policy that you can share with other countries, based on your experience in this area?

### Community level implementation

Can you explain how DRR policies and measures are implemented at the community level?

What best practices have you encountered in the implementation of DRR policies and measures at the community level?

### Mainstreaming DRR in agricultural sector

Do you think that there is adequate mainstreaming of DRR in the Agriculture Sector?

What do you think is required for mainstreaming DRR in agricultural sector?

What are some best practices in mainstreaming DRR in agricultural sector that you have encountered?

### Monitoring

What are your thoughts on monitoring of DRR implementation?

Can DRR monitoring be improved?

If yes, how can this be achieved?

**End of Interview**

## Appendix 4

**School of Agriculture, Policy and Development**

University of Reading


**Form 2. MSc PhD Staff Ethical Clearance Submission Form**

**PLEASE allow a minimum of 3 weeks for this process.**
**You must not begin your research until you have obtained consent as evidenced by this form returned from the APD student Office signed and dated. Ethical Clearance cannot be granted retrospectively.**

This form can only be used if the application :

- Does not involve participants who are patients or clients of the health or social services
- Does not involve participants whose capacity to give free and informed consent may be impaired within the meaning of the Mental Capacity Act 2005
- Does not involve patients who are 'vulnerable'
- Does not involve any element of risk to the researchers or participants
- Does not involve any participants who have a special relationship to the researchers/investigators

If any of the above apply, please refer to the APD Ethics Chair to decide whether an application can be made through the APD review process or whether the application needs to be referred to the full University Committee.

**It is the applicant's responsibility to check for any particular requirements of a funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.**

Full details of the University Research Ethics procedures are available at http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REethicshomepage.aspx and you are encouraged to access these pages for a fuller understanding. Some helpful advice is available on this link http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REwhatdoIneedtodo.aspx and the FAQs are particularly relevant.

**ALL QUESTIONS MUST BE COMPLETED.**

**APD Ethical Clearance Application Reference Number : 1065C**

1. **APPLICANT DETAILS:**

| | |
|---|---|
| Main applicant name: | Faustina Wiggins |
| Name of academic supervisor/project investigator: | Dr. Henny Osbahr |
| UR Email Address (decision will be emailed here): | f.n.wiggins@student.reading.ac.uk |
| MSc Student | ☒ |
| PhD Student | ☐ |
| Staff Member | ☐ |
| Other (please specify) | Click here to enter text. |

2. **PROJECT DETAILS:**

Title of project: An assessment of Disaster Risk reduction (DRR) policies in the Agriculture sector of Jamaica and Dominica

Please provide a lay summary of the project, including what is being investigated and why: The project will examine existing DRR policies that have been adopted by Jamaica and Dominica in order to conclude on best practices that can be used to inform DRR policy making for the rest of the Caribbean Region. It is hoped that this research will add to the growing number of studies of disasters in the Caribbean and the governance of disasters which are predicted to increase in frequency and intensity. Caribbean countries are vulnerable to the effects of natural hazards given that most have been designated small island developing states and do not have the capacity to recover from a natural hazard without international assistance. They will need robust policies that would enable them to build back better after an event and also to assure external funding agencies that they are achieving agreed to resilience building targets such as the Sendai Framework. The main aim of this study is to assess the adoption and implementation of disaster risk reduction policies in Jamaica and