

Saint Lucia: Country Document for Disaster Risk Reduction, 2014





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Disaster Risk Reduction Terminology

The terminology used for the preparation of this document is that used by the United Nations Office for Disaster Risk Reduction (UNISDR) or terminology established in the national legal framework. A Glossary comprising the definition of these terms is provided in **Appendix 1**. The aim is to promote understanding and use of common disaster risk reduction (DRR) concepts, as well as support DRR efforts undertaken by the government, experts and the public.

A Disaster is:

A serious disruption of the functioning of a community or a society, causing widespread human, material, economic and environmental losses which exceed the ability of the affected community or society to cope using its own resources. (Source: UNISDR)

Disaster = Hazard Exposure x Vulnerability

Disaster Risk Reduction = Reduced hazard exposure and lessened vulnerability



Photo Credit: Hurricane Tomas After Action Report (2011)

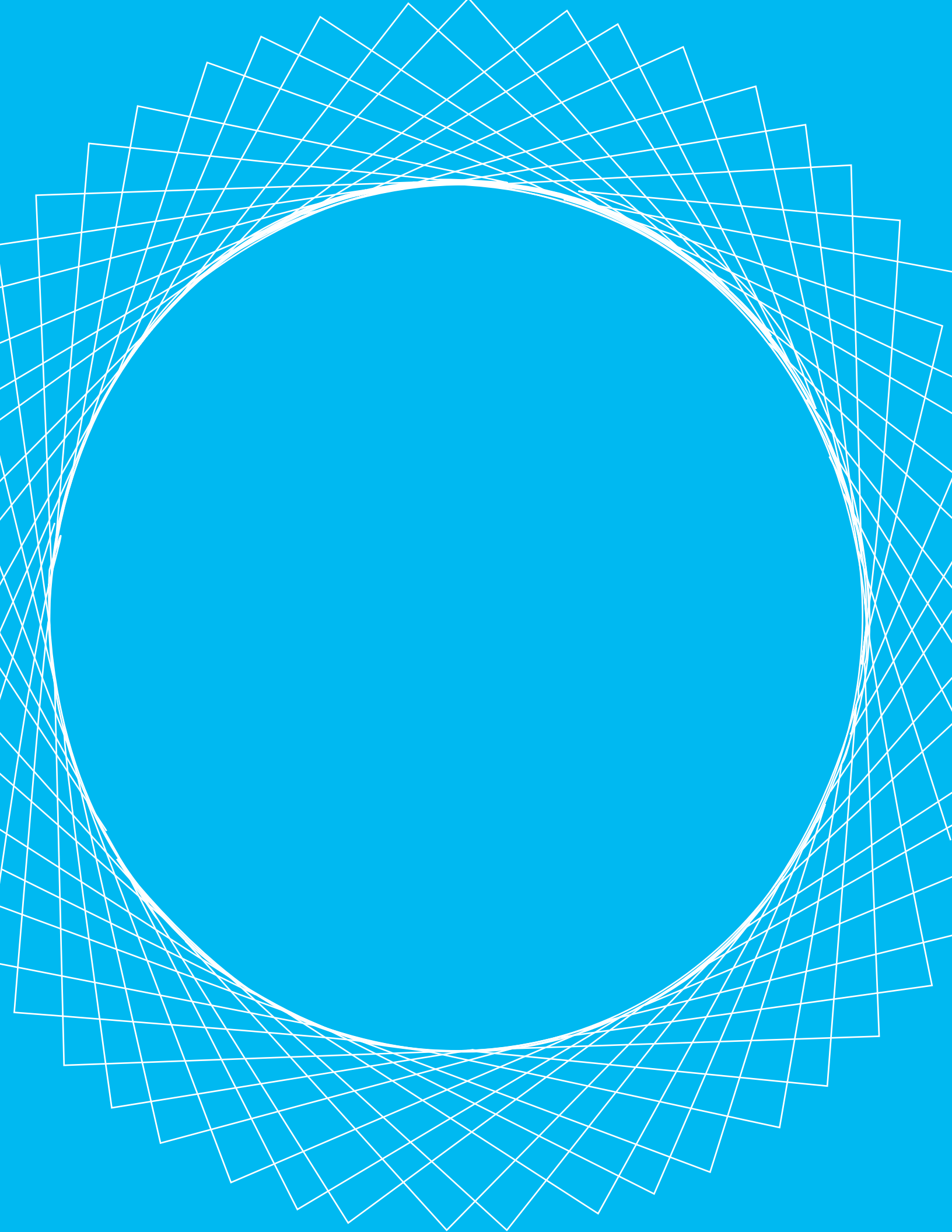


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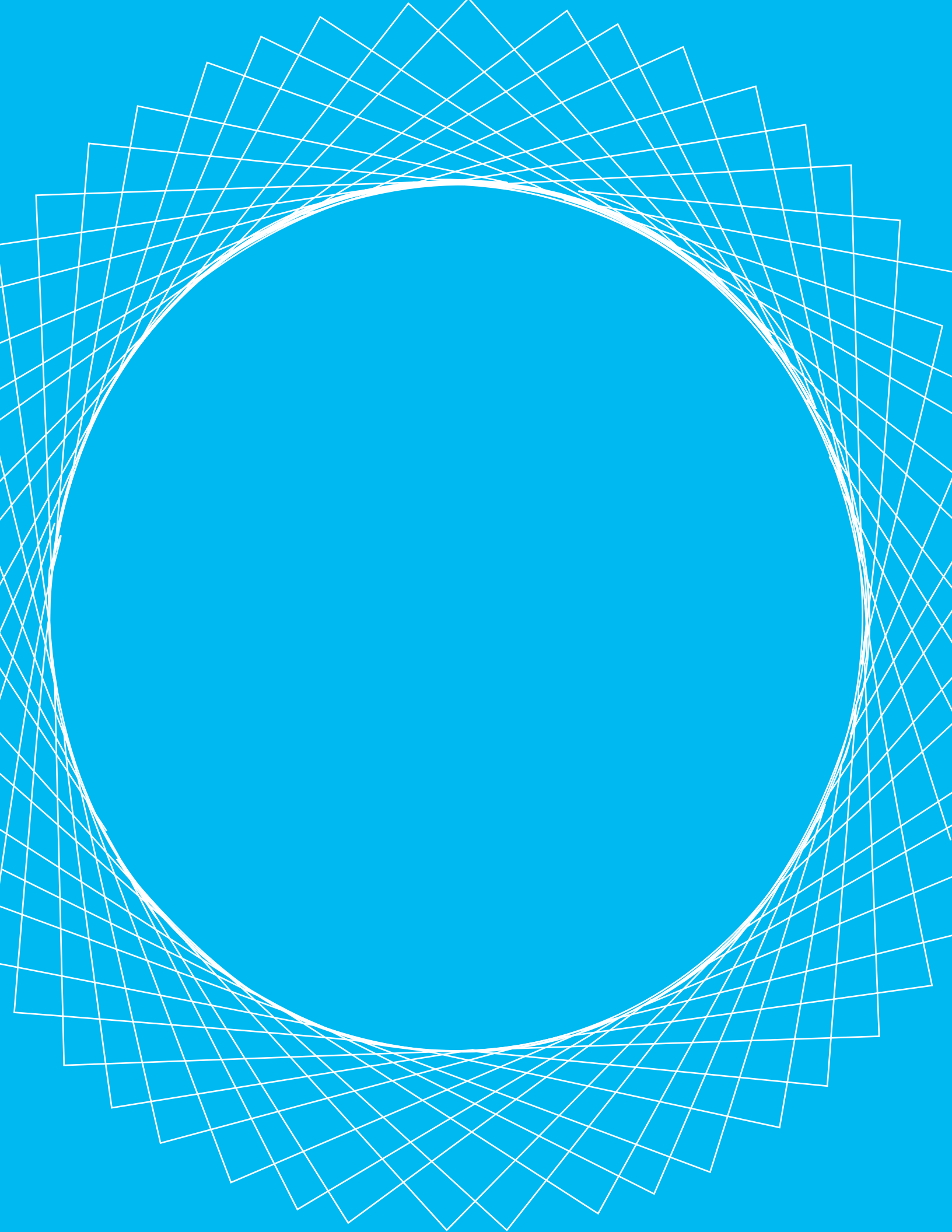
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1. Summary for Policy-Makers

Background

The updating of Saint Lucia's Country Document for Disaster Risk Reduction (SLU DRR - CD) was made possible through the United Nations Office for Disaster Risk Reduction (UNISDR) regional project, financially supported under the framework of the Disaster Preparedness and Prevention Programme (DIPECHO) of the Department of the European Commission for Humanitarian Aid Under the DIPECHO Action Plan for the Caribbean 2013-2014, Saint Lucia, in line with the expressed commitment of the Government of Saint Lucia (GOSL) to DRR, sought to update its country document for disaster risk reduction (DRR).

According to the National Hazard Mitigation Policy, the Government of Saint Lucia envisages...
"A nation highly resilient to hazard impacts and adaptable to hazard risks"

In updating the first SLU CP-DRR compiled in 2012, the NEMO sought to identify some of the foremost emerging issues to be revisited and addressed in the Country Document for Disaster Risk Reduction. These included biodiversity management, gender mainstreaming, renewable energy, and sustainable land management as well as the need to further integrate issues of climate change.

The updating of the SLU DRR – CD also took into consideration the application of the "Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean" (developed by the UNISDR) which supported the identification of key DRR actions at national, sub-national and local levels.

Purpose of the Document

The purpose of the updated SLU DRR - CD is to provide a comprehensive overview of the status of DRR in Saint Lucia and the progress made in reducing risk. The document also seeks to define national priorities and strategies and identify major challenges faced in reducing the loss of lives, as well as the impacts generated by economic, social and environmental risks.

The SLU DRR – CD is also an important reference document for the design of policies and strategies, for planning and implementation of DRR activities and for decision making for action by representatives of national systems, organizations and institutions that work on DRR in the country as well as international cooperation agencies.

It is expected that the document will be used to influence authorities at various levels of national management, as well as to facilitate the establishment of channels for mutual help and cooperation.

The SLU DRR - CD maintains the original design of being dynamic, flexible, and sustainable, and thus adaptable to changing circumstances and to the continuous inclusion of improvements and innovations, in its regular updating. It therefore seeks to identify and link existing DRR information in the country, both for current formulation and for regular updating.

The main elements of the updated SLU DRR – CD are highlighted in Box 1.1.

Box 1.1 Main Components of SLU CP-DRR

- a. International and regional context for DRR
- b. National circumstances that impact DRR
- c. Disaster inventory
- d. Risk identification and analysis - integration of vulnerability and adaptation assessments
- e. State of disaster risk in the country
- f. Priorities for DRR in the country
- g. Strategic directions for DRR

Conceptual Framework for Disaster Risk Reduction (DRR)

Disaster Risk Reduction (DRR) is the conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development¹.

The key elements of DRR are:

- a. **Risk awareness and assessment** including hazard analysis and vulnerability/capacity analysis;
- b. **Knowledge development** including education, training, research and information gathering;
- c. **Public commitment and institutional frameworks** including organizational, policy, legislation and community action;
- d. **Application of measures** including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
- e. **Early warning systems** including forecasting, dissemination of warnings, preparedness measures and reaction capacities **for a range of hazards**.

Methodology

The process of updating the SLU DRR – CD was inclusive and participatory, and coordinated under the leadership of the entity responsible for coordination of the national disaster risk management (DRM) system, the National Emergency Management Organization (NEMO). The process involved the collaboration of all the DRR actors, including national authorities responsible for DRR implementation in the country, key stakeholders working on DRR in all relevant sectors (such as health, education, planning, housing and development, economic affairs and finance, etc.), technical and scientific institutions, the private sector, civil society, District Disaster Committees, international cooperation agencies, DIPECHO partners, and members of existing DRR platforms, among others.

The phases in the process included:

- Joint review of the SLU CP-DRR prepared in 2012, through desk research, work meetings including focus group discussions and one-on-one interviews for identification of gaps and preparation of a draft updated SLU DRR – CD;

¹ United Nations Office for Disaster Risk Reduction (ISDR).

- Presentation of the draft document at two national validation workshops for validation of DRR priorities; and
- Circulation of a draft final SLU DRR – CD for final approval by the NEMAC, followed by approval from the Cabinet of Ministers.

Assumptions and limitations of the document were largely related to the availability, practicality of formats and quality of data and information.

National Circumstances

Saint Lucia is a Small Island Developing State (SIDS) located at latitude 13° 59' N, and 61° within the Lesser Antillean Arc of the Caribbean Archipelago, and situated on a volcanic ridge. The island covers a land area of 616 km², characterized by steep, rugged landscapes with deep valleys and fast flowing rivers.

The combination of the steep topography and young volcanic soils, constantly subjected to seasonal high rainfall, make the island very susceptible to soil erosion. Poor practices relating to disposal of waste, deforestation and land use also contribute to increased risk to disasters and weakened resilience.

“Disasters have the tendency to exacerbate poverty and undermine development planning, particularly poverty reduction strategies”

UN Secretary General Ban-ki-Moon

Large segments of the island’s population are located along the coastal belt, where low land agriculture and coastal resources are the main sources of livelihood. The narrow low land strip which circumscribes the island is characterized by concentrations of haphazard and unplanned human settlement and other development. The rapid urbanization of former rural areas of the island, manifested in approximately 60% of the population residing along the north-west corridor, has resulted in denser populations living in unplanned or informal settlements.

As is the case for Caribbean SIDS, global climate change is considered one of the most serious threats to the sustainable development of Saint Lucia and the projected impacts are expected to be devastating. The onset of the climate change phenomenon thus imposes new hazards associated with the direct impacts such as sea level rise on Saint Lucia and exacerbates existing ones.

A number of externalities have impacted and continue to impact the island’s economy. The development priorities of Saint Lucia provide opportunities for widening the scope of socio-economic and environmental sustainability to include considerations for disaster vulnerability and DRR. While the country’s vulnerability to disasters is projected to be exacerbated by climate change, the future vulnerability of Saint Lucia will also depend on its development path. In this context mainstreaming of DRR and climate change adaptation (CCA) that is, climate smart DRR, into development policies, plans and programmes now becomes a pre-condition for sustainable development.

DRR Legal, Regulatory and Institutional Framework

The policy, legal, regulatory and institutional framework governing DRR is quite varied and mixed, reflecting a highly evolved governance framework, though with a strong orientation to disaster preparedness, response and recovery, and lesser emphasis on disaster planning, prevention and mitigation.

The regulatory framework for DRM is given effect through the National Emergency Management Plan (NEMP)², which finds authority in the Disaster Management Act, 2006 [Replaces Act No 13 of 2000], and the national CDM Strategy. Also of importance are some key related regulations such as the draft Physical Planning Regulations under the Physical Planning and Development Act (2001); national building codes/standards³; and draft Environmental Impact Assessment (EIA) Regulations, which all have significant implications for DRR within the context of development planning. Worthy of note also are emerging trends in international and regional standards and regulations for operations within certain sectors such as agriculture, tourism, education and health, which have a stipulated requirements for disaster risk management.

With the exception of the Hazard Mitigation Policy, all of the other disaster management policies identified have a strong focus on disaster preparedness and response, with limited reference to the planning, mitigation and prevention components of DRR. There are also a number of other public and sectoral policies which implicitly address the concepts of disaster risk management (DRM) and disaster risk reduction (DRR), key of which are the National Environmental Policy and Strategy (NEP/NEMs), National Water Policy, National Land Policy, Climate Change Policy and Adaptation Plan and the National Social Protection Policy.

The institutional framework for national disaster management in Saint Lucia comprises the National Emergency Management Organization (NEMO), supported by a network of volunteers comprising thirteen (13) National Committees and eighteen (18) District Disaster Management Committees, operating under the jurisdiction of the NEMO, and involved in the planning and response to disaster impacts. Additionally, there is the National Emergency Management Advisory Council (NEMAC) which provides the overall mechanism for coordination of disaster management activities in Saint Lucia.

Further, the NEMO organizational structure allows for the involvement of Social Transformation Officers to act as Ex-Officio members of the District Disaster Committees. The Local Government Councils are also integral to the functioning of the District Committees.

State of Disaster Risk in Saint Lucia

Conditions of risk for Saint Lucia have been identified in several documents emanating from reviews and assessments including, the National Hazard Mitigation Policy, the Disaster Management Policy Framework, the Risk Management/ Vulnerability Benchmarking Tool (B-Tool) Report for Saint Lucia⁴ and the CDEMA Disaster Management Audit Country Report for Saint Lucia (2010).

The Saint Lucia Disaster Catalogue provides a formal historical compilation on disasters, categorizing the history making events based on time period, and by type of disaster event. First produced in 1999⁵, the catalogue requires regular updating as events occur. The National Risk Register compiled in 2006 also categorizes the range of hazards to which the country was exposed at that time.

2 The National Emergency Management Plan (NEMP) and its sections and subsections can be accessed on the Government of Saint Lucia Official Website: <http://www.stlucia.gov.lc/nemp>.

3 The Impact of Climate Change on Design Wind Speeds [Cabinet Approved 1151/2009].

Engineering Guidelines for Incorporating Climate Change into the Determination of Wind Forces [Cabinet Approved 1151/2009].

4 USAID/OECS, 2007. Risk Management/ Vulnerability Benchmarking Tool (B-Tool), National Assessment: Saint Lucia.

5 A. L. Dawn French, 1999. Disaster Catalogue for Saint Lucia.

Hazards/Threats

The catalogue listing of disaster events, and the aforementioned assessments all corroborate that Saint Lucia, by virtue of its geographic location, physical formation and fragile ecosystems, is highly exposed to a number of natural and anthropogenic/human-made hazards, which have the potential to cause loss of lives, severe damage to infrastructure and other economic assets, as well as cause adverse effects on livelihoods. The types of hazards/threats to which Saint Lucia is vulnerable are identified in **Table 1**.

Table 1.1 Types of Hazards/Threats Identified for Saint Lucia

Natural	<ul style="list-style-type: none"> ▪ Geological hazards: earthquakes, volcanic activity and emissions, and seismic related geophysical processes, such as mass movements, landslides, rockslides and surface collapses, debris or mud slides, and tsunamis. (Hydro-meteorological factors are important contributors to some of these processes.) ▪ Hydro-meteorological hazards: include tropical cyclones, thunderstorms, coastal storm surges, floods including flash floods and drought.
Anthropogenic/ Human –made	<ul style="list-style-type: none"> ▪ Socio-natural hazards: Environmental degradation (deforestation, uncontrolled/rapid unplanned and informal development, and poor waste management) leading to collapse of public health, security and safety – mass casualty; transportation accidents (air, sea or land); Civil disturbance; Disruption of Energy and Supplies; Structural Emergency ▪ Technological hazards: Pollution, fires, explosions, toxic spills, mining and geothermal prospecting in highly sensitive environmental areas, among others. ▪ Pollution from unexploded arms and munitions, obsolete chemicals/POPs. ▪ Data and information impairment
Emergencies affecting Public Health and Safety	<ul style="list-style-type: none"> ▪ Illnesses and epidemics of major occurrence. Examples include: avian flu, traditional and haemorrhagic, malaria, dengue, cholera, among others. ▪ Phytosanitary emergencies - pestilence. ▪ Vector borne diseases such as dengue, and non-endemic illnesses with the onset of climate change ▪ Biological (GMOs, LMOs, SMOs)
Climate Change Impacts	<ul style="list-style-type: none"> ▪ Extreme weather events ▪ Sea level rise ▪ Coastal Erosion

The island is also highly susceptible to the vagaries of international trade and exogenous economic and financial shocks. Safety and security issues are now high on the global and regional agendas and so need to be elevated on the national agenda. Terrorism, biosecurity, food security, and the environmental health and security implication of “open borders” are but some of the concerns.

Historically, hurricanes, storms and flooding have been the most likely hazards to affect Saint Lucia. Flooding has been of major concern particularly in low-lying areas as well as coastal villages and has resulted in the displacement of people and the destruction of property



Figure 1.1 Damage due to Hurricane Tomas

in communities. Droughts have also affected the quantity and quality of available water supplies to local communities and productive sectors of the economy. About eight (8) major land slippages, have also resulted in significant loss of lives (for example the 1938 Ravine Poisson Landslide), and the destruction of homes, dislocation of approximately 145 families, loss of biodiversity particularly from landslides at La Sorcière, and costs totaling over two million Eastern Caribbean Dollars (EC\$2M) as a result of Hurricane Tomas in 2010.

Damage Assessment and Needs Analysis (DANA) Policy (2007) and more recently the use of the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC) Damage and Loss Assessments (DaLA) methodologies, bear out the issue of the increasing cost of disaster events, related to loss of lives and property, human injury, destroyed tourism and general infrastructure, crops and livestock, and household and commercial and industrial assets. For example, Tropical Storm Debbie in 1994, resulted in losses of over EC\$230 million⁶. The Tropical Wave of October 1996 also incurred an estimated EC\$12 million in damages to property and infrastructure particularly in Soufrière, Anse la Raye, Vieux Fort and Castries. Damage sustained from Tropical Storm Lili in 2002 was estimated at \$20 million and colossal losses of over EC\$900 million were reported for Hurricane Tomas in October 2010.^{7,8}

Vulnerability

The plethora of documentation on disaster management widely endorse that Saint Lucia's vulnerability to devastating natural and anthropogenic/human-induced disasters, can be attributed to *"a dynamic set of risks that emerge from antecedent conditions determined by physical, social, economic, environmental and political factors"*.⁹

Examples of such factors and processes that increase the susceptibility and exposure of a community, structure, service or geographic area to hazards; include (a) its small geographical area, which accounts for the fact that disasters take country-wide proportions; (b) its location in some of the highest risk areas of the planet, such as mid-ocean ridges with strong volcanic and seismic activity, tropical cyclone belts, and direct exposure to the forces of the oceans; and (c) the fact that it is dependent on few sources of income, in the agricultural sector or in tourism, for a substantial part of its gross national product (GNP). These sources of income have been severely reduced for months by a single catastrophic event.

Criteria and methodologies for analysis of vulnerability have not been clearly defined for specific hazards/risks, except in the vulnerability and adaptation (V&A) assessments for the Second National Communication (2010) on Climate Change for Saint Lucia. The Vulnerability and Capacity Assessments (VCAs) coordinated by the Saint Lucia Red Cross (SLRC), involved the use of criteria and methodology outlined in a Community Disaster

Summary of Economic Loss in Saint Lucia as a result of Hurricane Tomas

The Economic Commission for Latin America and the Caribbean (UNECLAC) reports total cost of damage and losses to the different sectors amounting to EC\$907.7 million (US\$336.2 million). The total impact represents 43.4% of GDP; with the scale of impact nine times agricultural GDP, three times tourism GDP, 62% of exports of goods and services, 19% of gross domestic investment and 47% of public external debt.

6 GOSL. 2003. Draft Hazard Mitigation Plan for Saint Lucia. NEMO.

7 Government of Saint Lucia, 2006. Natural Hazard Mitigation Plan.

8 UNECLAC, 2011. Saint Lucia, Macro socio-economic and environmental assessment of the damage and losses caused by Hurricane Tomas.

9 Adapted from Study Report "Facing Hazards and Disasters: Understanding Human Dimensions. National Academies Press". <http://www.nap.edu>

Response Team (CDRT) field guide, based largely on that for Damage Assessment and Needs Analysis (DANA). The Vulnerability Assessment Benchmarking Tool (B-Tool) developed by the OECS Secretariat, is a quantitative assessment tool which evaluates capacities in the six phases of risk management. Both the CDEMA CDM Audit and the HFA Monitor utilize a more qualitative assessment methodology. Key indicators are proposed by the HFA in the HFA Monitor that enable assessment of progress made in DRR.¹⁰

Some limited national and local assessments based on hazard data and vulnerability information are available, and include risk assessments for key sectors¹¹. However, there are still no systems in place to monitor, archive and disseminate data on key hazards and vulnerabilities and the absence of a comprehensive national multi hazard database/archive with protocols for information sharing impede the use of mechanisms to inform the local and regional DRR effort. Mechanisms for the systemic research, recording and analysis of the hazards which have impacted Saint Lucia and the impacts of these hazards also need to be established.

A comparison of the various capacity assessments undertaken to date utilizing the qualitative outputs for the various capacity areas/tools reveals severe limitations in the areas of human capacity, technical tasks and contents, financial resources and information management.

Cognizant that DRM programmes are multi-disciplinary and multi-faceted, the country needs to have access to capacity development programmes that would enhance institutional and community capacity at all levels (systemic, institutional and individual).

Risk Assessment for Country DRR

Defining criteria for disaster risk (DR) analysis/management is for the most part difficult, due to the lack of a comprehensive conceptual framework of disaster risk that facilitates DR evaluation and intervention from a multidisciplinary perspective.

The country, in keeping with the Disaster Management Act No. 30 of 2006 has developed a National Risk Register. There is also a Saint Lucia National Climate Change Risk Register, dated October 28, 2008.¹² Hazard/risk mapping is available for some of the phenomena including landslide, drought, and floods.

Hydro-meteorological hazards and health emergencies were given high risk ratings. Geodynamic/Geological and socio-natural hazards were rated between medium to low risk, with the exception of deforestation, which was rated a high risk hazard. Technological hazards were deemed to be medium risks, but terrorism was unrated.

Saint Lucia is a country with limited experience in the area of disaster risk analysis. Prioritization of risks has been limited to the sphere of climate change and areas of intervention have been proposed in this regard through the SNC process, and presented in the SNC Report.

However, the current broad level risk assessment/analysis indicates that the country presents predominant conditions of high exposure and susceptibility, social fragility and lack of resilience that favour risk accumulation and incapacity to respond to disasters. It is also apparent that while the country's risks from a macro-economic

¹⁰ <http://www.preventionweb.net/english/hyogo/hfa-monitoring/national/?pid:73&pih:2>

¹¹ The V&A assessments conducted for the SNC highlighted the vulnerabilities of several critical sectors including; water resources; land resources; agriculture; coastal sector; marine resources; forest terrestrial resources; health; financial services; and critical infrastructure.

¹² Information provided in the document is deemed valid only at the date of publication as risks are intended to be monitored on an ongoing basis.

and financial perspective in terms of responding to catastrophic events may decrease, the country still does not have resources to face catastrophic events.

Priorities outline below for addressing risk have been presented in the Disaster Management Policy Framework approved by Cabinet in 2009¹³, and are consistent with those emanating from the B-Tool Assessments, SNC and HFA monitoring reports:

- Timely, coordinated and focused direction of resources towards the disaster management system's effective operation.
- Maintaining institutions that are technically capable of efficiently executing the comprehensive disaster management programme.
- Developing local expertise capable of operating and maintaining the disaster management system.
- Ensuring that the public is well informed and educated about disasters, their consequences and preventive and mitigation measures.
- Creating an environment in which the private and non-government sectors contribute meaningfully to the comprehensive disaster management effort.

Some key issues for consideration with regard to risks (Global Assessment Report, 2011)

- The sheer scale of recurrent and probable maximum losses should be enough to shock governments into action.
- Governments are liable for a significant part of total expected losses – and they rarely have the contingency financing to match this liability.
- Governments need to decide how much risk they are willing to retain and how much they can afford to transfer.
- A balanced portfolio of prospective, corrective and compensatory risk management strategies is the most cost-effective way to reduce disaster risks and support development.

Strategic Guidelines for Country DRR

One of the aims of adopting a DRR approach is to help countries transform to a sustainable disaster resilient development path. The need for Saint Lucia to invest in DRR is clear, as risks are increasing. This has been made evident in the increasing occurrence and the demonstrable severe impacts of multiple disasters, resulting in rising socio-economic losses associated with sharp rises in damage to housing and critical local infrastructure and public assets such bridges, schools and health facilities. The further exacerbation by the impacts of climate change is also a likelihood.

A national CDM strategy has been endorsed through high level consultations in country since 2001, but there seems to be limited progress in integrating disaster management into the planning process, as the required political leadership to champion the process and technical capacity to implement the type of interventions identified has been inadequate to enable the requisite paradigm shift.

13 Objective of the Policy is to advance an approach to disaster management that focuses on reducing risks - the risk of loss of life, economic disruption and damage to the environment and property, especially to those sections of the population who are most vulnerable due to poverty and a general lack of resources.

The country document for Saint Lucia (prepared in 2012) and the Criteria applied under the 2013-2014 DIPECHO Action Plan were used to identify DRR opportunities. The documents highlight the need for legal and institutional strengthening, information, education and communication, early warning systems, hazard, risk and vulnerability assessments as key areas for attention (Figure 3). Capacity strengthening, baseline data development, Early Warning Systems and local disaster management were among the most highlighted opportunities for intervention.

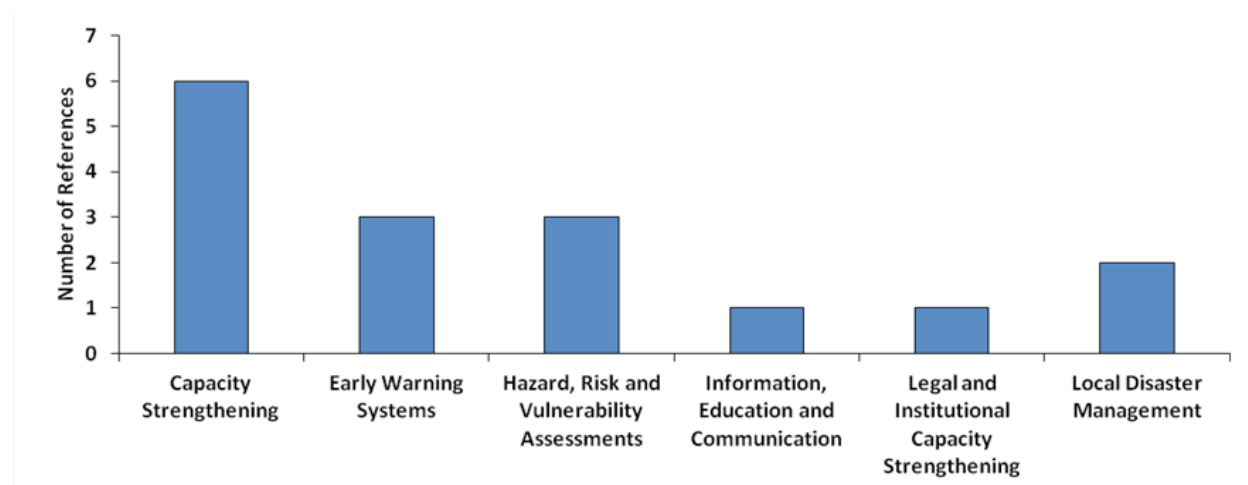


Figure 1. Key DRR Focus Areas for Saint Lucia

As it relates to the legal and institutional frameworks, the following opportunities were presented:

- Overall governance structures need to be improved to facilitate inputs from the local to national level as well as the necessary coordination among DRR partners.
- There is a need for the development of institutional and community capacity (systemic, institutional and individual), including expanding the information and knowledge base, in terms of up-to-date scientific information, and local knowledge and expertise that remain key requirements for DRR.
- The DRR approach requires strengthening of the national multi-sectoral platform. This platform would drive a DRR policy, planning and implementation framework that is transparent, fully participatory and accountable. This will require fully developed, coordinated and coherent action on DRR across different sectors, public and private sector, and between central and local governments.
- Adequate resource allocations in the budgets for the efficient and effective functioning of the DRR mechanisms.
- Regulate urban and local development with DRR instruments and mechanisms such as building codes and land use planning

The area of information, education and communication corresponds to the section of the CD that deals with knowledge management. Highlighted in this regard was the need for education and awareness and research and knowledge management as ways to enhance resilience at various levels of society. Participants at the national validation workshops proposed public awareness and education campaigns as primary mechanisms. Specific actions were suggested for addressing the drivers of risk by targeting the schools, community groups, farmers and seeking out champions for the DRR cause at the Cabinet level.

As it relates to hazard, risk and vulnerability assessments, there are still no structured systems in place to formally monitor archive and disseminate data on key hazards and vulnerabilities. There is also the absence of a comprehensive national multi hazard database or archive with protocols for information sharing which impedes the use of mechanisms to inform the local and regional DRR efforts. Infrastructure for the systematic research, recording and analysis of the hazards which have impacted Saint Lucia and the impacts of these hazards also need to be established. There is a need to improve information on how the characteristics of hazards are changing with detailed risk assessments from diverse sources of knowledge. The regular updating of the national risk register is thus seen as a critical action required for supporting risk forecasting.

Capacity to undertake predictive analysis is also another area to be addressed and would require, proper instrumentation for data collection and data management, including the development or expansion of computerised databases. There is a distinct need to define risk scenarios for other non-climate related hazards, based on a holistic approach that will enable multi-hazard analysis and promote more effective, fit-to-purpose solutions/ interventions. Due consideration must also be given to the fact that risk is clearly most detailed at a micro social or location/site specific scale.

Risk mapping of vulnerable groups will also help to profile each of these groups within the context of the vulnerable situations in which they live and to identify their coping and adaptive capacities. The mapping will also help to identify hotspots of high vulnerability in Saint Lucia.

Three priorities identified during the national consultation on the revised CD were within the DRR elements of risk awareness and knowledge development and include 1) enhance the National Disaster Inventory System to systematically record hazards, assess and monitor damage and loss at all scales using probabilistic models, and regular updating of the National Risk Register to enhance risk forecasting; 2) undertake risk mapping to include social and ecological vulnerability; and 3) conduct risk trend analysis, multi-hazard analysis and, Vulnerability and Capacity Assessments (VCA).

Further elaboration of the strategic directions and guidelines are presented within the context of the five (5) elements of DRR in Table 1.2.

Table 1.2 Strategic Priorities and Guidelines

DRR Elements	Strategic Direction	Strategic Guidelines/Actions
Risk Awareness and Assessment	Improve Information on how hazards are changing with detailed risk assessments from diverse sources of knowledge	<ul style="list-style-type: none"> f. Enhance the national disaster inventory system to systematically monitor losses and assess risks at all scales using probabilistic models g. Undertake risk mapping of social vulnerability h. Conduct multi-hazard analysis and vulnerability and capacity assessments
Knowledge Development	Build Adaptive Capacity: with new skills, knowledge and resources	<ul style="list-style-type: none"> i. Enhance systems for Research and Systematic Observation (RSO) j. Conduct structured and targeted Public Education and Outreach (PEO) Programmes k. Establish effective systems for information sharing and dissemination
Public Commitment and Institutional Frameworks	<p>Improve DRR governance by empowering and supporting communities to address root causes of vulnerability</p> <p>Build participatory risk governance capacities</p>	<ul style="list-style-type: none"> l. Demonstrate political leadership and will by placing policy responsibility for DRR and CCA in a core ministry of national development m. Harmonize national and sectoral policies to achieve coherence in policies to stimulate and enforce DRR processes n. Commit resources for the upkeep and upgrading of the NEMO and other components of the national disaster management framework for implementation of DRR functions

DRR Elements	Strategic Direction	Strategic Guidelines/Actions
Application Measures	Investment in hazard mitigation/resilience building measures in all public and private development	<ul style="list-style-type: none"> o. Provide for a Mitigation Officer to coordinate and champion Mitigation p. Increase capital investment for climate sensitive/ disaster resilient/ resistant critical infrastructure and national assets q. Enhance programmes for social protection (e.g. poverty reduction and employment) to include resilience building r. Environmental/health management through protection of ecosystems and natural resources (e.g. watersheds, forests, reefs, beaches, wetlands)
Early Warning Systems	Improve forecasting, dissemination and preparedness measures and reaction capacities	<ul style="list-style-type: none"> s. Enhance and expand sphere of early warning systems especially for storms and floods t. Improve and expand data monitoring networks

Conclusions and Recommendations

Disaster and climate change impacts are cross-sectoral in nature and are usually manifested in effects on the country's natural resources, national infrastructure and assets and the population. These impacts may however, be further exacerbated by the local risk realities emanating from physical, social, economic, environmental and political factors. There is growing recognition of the need for disaster prevention, mitigation or preparedness to be more formally and routinely integrated into the appraisal of projects or programmes, particularly those financed by public investments, for example, infrastructure, health and education.

However, costs for rehabilitation post disaster, still continue to simply recur as opposed to cost reductions from having incorporated climate resilience and mitigation measures in projects and programmes.

The Global Assessment Report (GAR), 2011, states that while great strides have been made in reducing loss of life, for at least weather related disasters, the reality remains that disaster-related socio-economic losses continue to rise. This is particularly so in developing countries where damage to housing and critical local infrastructure and public assets such bridges, schools and health facilities has risen sharply¹⁴. It is therefore

"The good news is that a natural hazard does not automatically have to lead to a disaster," Mr. Ban Said. "Countries such as Bangladesh, Cuba, Jamaica, Madagascar and the Philippines have shown that good building designs, proper land-use planning, public education, community preparedness and effective early warning systems can reduce the impact of severe weather events."

UN Secretary-General Ban Ki-moon 30 September 2008.

apparent that the risk of losing wealth to natural disasters is beginning to outpace wealth creation, and as advocated, DRR must of need be incorporated in all sustainable development strategies.¹⁵

As financial resources continue to decline, the GOSL, like all other governments, will be driven to increasingly give consideration to resilience building. Key challenges in enhancing resilience to climate and disaster risks

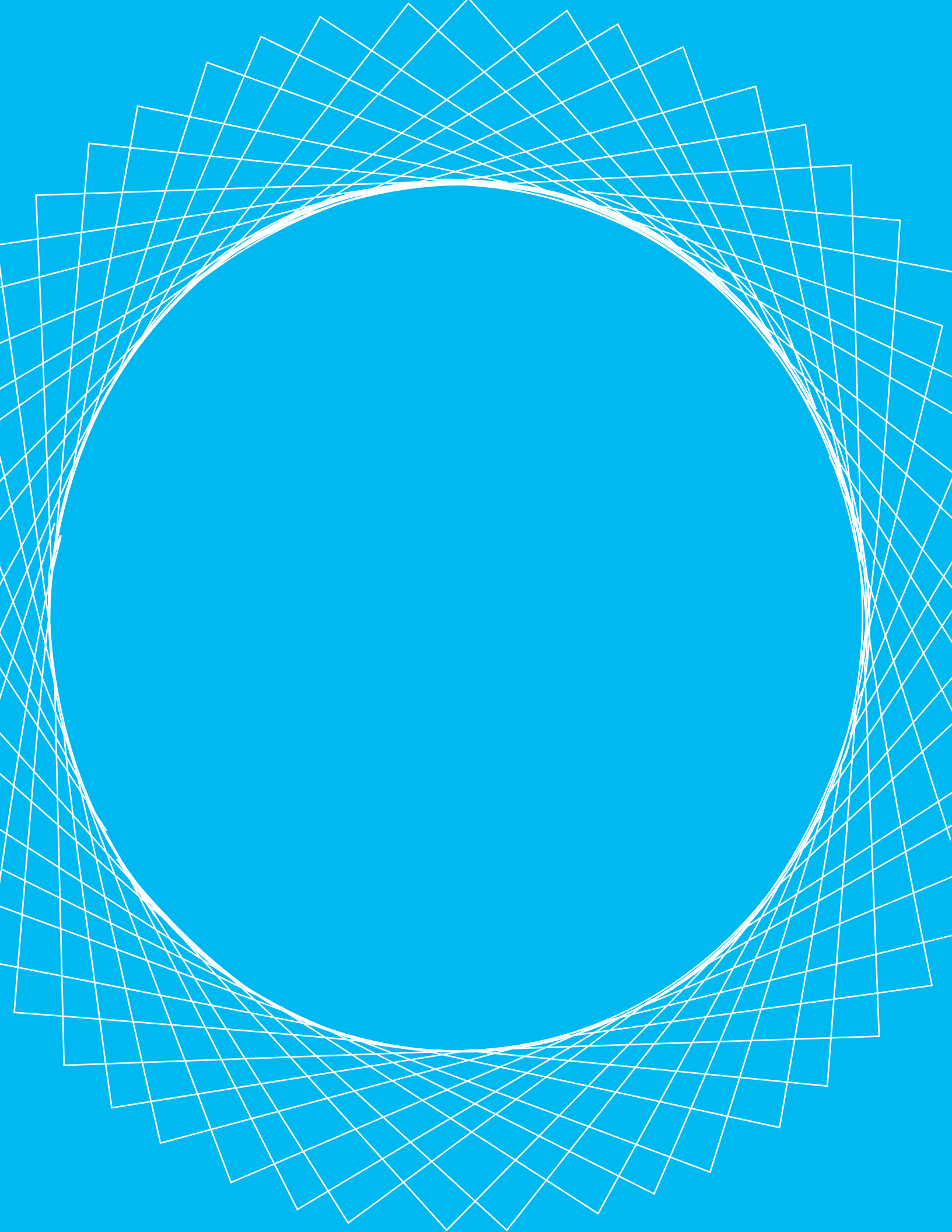
14 Over the past three decades, the risk of economic loss as a result of floods rose by over 160 per cent, while economic loss incurred as a result of cyclones surged by 265 per cent in member countries of the Organisation for Economic Cooperation and Development (OECD). UN.2011 Global Assessment Report (GAR) on Disaster risk reduction (DRR) – Revealing Risks, Redefining Development. UNISDR.

15 Nassir Abdulaziz Al-Nasser, President of the General Assembly for RIO +20 Conference in thematic debate on disaster risk reduction: "addressing disaster risk reduction is therefore inseparable from the broader sustainable development agenda".

in Saint Lucia include managing the overall disaster risks to ensure social protection, maintaining economic resilience and minimizing environmental degradation; protecting vulnerable and critical infrastructure, promoting sustainable land use planning and reforestation; ensuring security of water supply and water resources; and collecting and analyzing climate change and disaster related data and information in a comprehensive and sustainable fashion in order to be able to respond to the challenges posed by climate and disaster shocks and stresses.

It is clear that a re-shaping of the policy mix to reflect the changing climate and disaster context is needed to provide a strategic framework for action that will promote environmentally sound development. This will be largely enabled through the resourcing and empowering of local/community level institutions for building the resilience of citizens and the State.

The NEMO, as the coordinating agency for disaster mitigation and prevention, has been recognized as the agency which is best positioned to drive the process to generate the level of commitment required by the GOSL, national agencies, and in particular those responsible for national development, to collaborate with development partners, to effect a fully coordinated response to DRR implementation. The NEMO will also need to advocate for requisite and concrete resources (human, technical and financial) to be committed and reflected within the National Budget to support the implementation of DRR activities and for investments in DRR, for the realization of sustainable disaster-resilient development.



2. Introduction

2.1 BACKGROUND

The updating of Saint Lucia's Country Document for Disaster Risk Reduction (SLU DRR - CD) was made possible through the United Nations Office for Disaster Risk Reduction (UNISDR), regional project financially supported under the framework of the Disaster Preparedness and Prevention Programme (DIPECHO) of the European Commission Department for Humanitarian Aid and Civil Protection (ECHO).

The 2013-2014 DIPECHO Action Plan for the Caribbean aims to establish greater collaboration and coordination between partners, allowing programming of common outcomes and the harmonization of practices. Furthermore, it focuses on improving communication and dissemination of Disaster Risk Reduction (DRR) key contributions in the region, by capturing evidence of success on how DIPECHO projects have allowed the most at risk communities to anticipate, withstand, adapt and sometimes, recover quickly from disasters. Under the DIPECHO Action Plan for the Caribbean 2013-2014, Saint Lucia is one of the countries that agreed to the updating of its country document for disaster risk reduction (DRR).

The commitment of the GOSL to DRR is enshrined in the Hazard Mitigation Policy [Document of the Saint Lucia National Emergency Management Plan] which envisages... *"a nation highly resilient to hazard impacts and adaptable to hazard risks"*.

In undertaking the updating of the **SLU DRR-CD**, the National Emergency Management Organization sought to identify some of the foremost and emerging issues to be revisited and addressed in the Country Document. These issues were largely recognized as elements for sustainable development, especially in the SIDS context, and included biodiversity management, gender mainstreaming, climate change adaptation, renewable energy/promotion of a green economy, and sustainable land management, especially in light of the finalization or current and ongoing revisions of national documents such as the Disaster Management Act (2006), the Revised 2nd National Biodiversity and Action Plan (Revised 2nd NBSAP), the National Land policy and the National Social Protection Policy.

The preparation/updating of the **SLU DRR-CD** also takes into consideration the application of the "Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean" which supported the identification of key DRR actions at national, sub-national and local levels.

2.2 PURPOSE OF THE COUNTRY DOCUMENT

The purpose of the Country Document is to provide a comprehensive overview of the status of DRR in the country, the progress made in reducing risk, the definition of priorities and strategies, the major challenges faced in reducing the loss of lives, as well as the economic, social and environmental impacts risks generate. The Country Document allows objective assessment of progress made and of the processes implemented for the reduction of vulnerability and the strengthening of resilience to risks caused by natural hazards. The Country Document is also an important reference document for the design of policies and strategies, for planning

and implementation of DRR activities, and decision making for action by representatives of national systems, organizations and institutions that work on DRR in the country and international cooperation agencies. It is expected that the document will be used to influence authorities at various levels of national management, as well as to facilitate the establishment of channels for mutual help and cooperation.

The **SLU DRR-CD** has been designed to be dynamic, flexible, and sustainable, thus adaptable to changing circumstances and to the continuous inclusion of improvements and innovations, in its regular updating. It therefore seeks to identify and link existing DRR information in the country, both for current formulation and the regular updating of the Country Document.

The main elements of the SLU DRR-CD derived from the key outputs of the process are highlighted in Box 2.1.

Box 2.1 Main Components of SLU CP-DRR

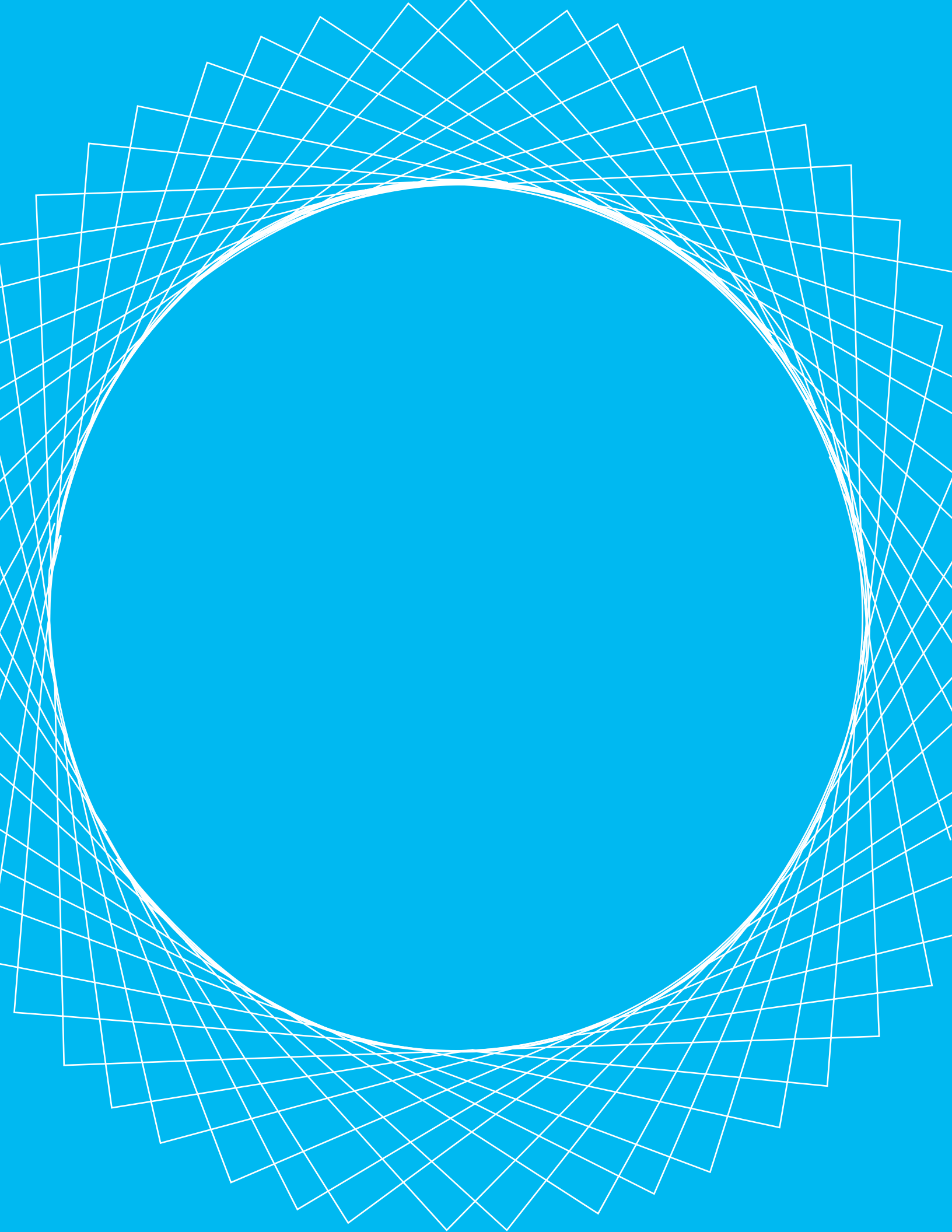
- International and regional context for DRR
- National circumstances that impact DRR
- Disaster inventory
- Risk identification and analysis- integration of vulnerability and adaptation assessments
- State of disaster risk in the country
- Priorities for DRR in the country
- Strategic directions for DRR

2.3 CONCEPTUAL FRAMEWORK FOR DISASTER RISK REDUCTION (DRR)

Disaster Risk Reduction (DRR) is the conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

The key elements of DRR are:

- a. **Risk awareness and assessment** including hazard analysis and vulnerability/capacity analysis;
- b. **Knowledge development** including education, training, research and information gathering;
- c. **Public commitment and institutional frameworks**, including organizational, policy, legislation and community action;
- d. **Application of measures** including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
- e. **Early warning systems** including forecasting, dissemination of warnings, preparedness measures and reaction capacities.



3. Methodology

The updating of the DRR – CD is recognized and appreciated as the result of the combined input and participation of a wide range of stakeholders across the various sectors of the Saint Lucian economy, including government agencies, statutory bodies, non-governmental organizations and civil society. The process, which commenced in July 2014, was executed under the oversight of the UNISDR Regional Liaison Officer in Barbados and the UNISDR Project Coordinator - Regional Office for The Americas, in collaboration with the local project counterpart –the National Emergency Management Organization (NEMO), represented by its Director.

The phases in the process included the review of the structure and content of the CP-DRR prepared in 2012, and the application of the “*Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean*”¹⁷, developed by the ISDR. The process also included presentation of the Draft updated Country Document at national workshops for validation of DRR priorities, and circulation of a Draft Final DRR-CD for final approval by the NEMAC, followed by approval from the Cabinet of Ministers.

3.1 PROCESS

The methodology used in the process of updating the DRR Country Document replicated that used in the preparation of the first SLU CP-DRR in 2012 as outlined in **Figure 3.1**, with some variations detailed as follows:

The SLU CP-DRR prepared in 2012 was first reviewed with participants using a participatory process involving a broad range of DRR stakeholders, during a series of consultations/work meetings, in order to revise the content of the document. Stakeholder groups were able to provide substantive feedback to the key content and structure of the first SLU CP-DRR, as well as responses to the “*Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean*”. The focus of the Criteria was to provide a holistic profile of DRR at the national level, and facilitate the identification of national DRR priorities, in accordance with the capacities and circumstances, to reflect the national situation.

The draft Updated Country Document was further reviewed at two national validation workshops. The main purpose of the national workshops was to validate and further revise the information available in the Draft Updated Country Document. **The objectives of the workshops were:**

- Provide an overview of the Country Document for Disaster Risk Reduction process
- Present and revise the draft version of the Country Document
- Obtain agreement on the content of the document
- Identify immediate DRR priorities and implementation actions for DRR in Saint Lucia

The expected outcomes of the workshops were:

- Obtain comments and recommendations for the revised DRR Country Document

¹⁷ Version updated in 2014 with a more sub-national focus.

- Agreement that the DRR Country Document can be finalized based on the comments and recommendations provided during the workshop.
- Identification of immediate DRR priorities at national level with suggestion for resources and timeframes for implementation.

A participatory approach was used to achieve the objectives and expected outcomes of the national validation workshops. Given the size of the document, a brief presentation on each section of the document was provided to the participants. The presentation also focused on the revisions recommended by various stakeholder groups during the consultative process. The presentation was followed by group work to assess the structure of each section, to identify any gaps and any inaccuracies in the information presented. Plenary sessions were used to present the findings of the groups and to provide any overarching comments or recommendations from the stakeholders. Participants were encouraged to provide comments or recommendations for improving the sections of the country document in their individual worksheets.

In relation to the identification of key actions for DRR at national/sub-national level, participants were further engaged in a plenary to validate the priorities identified during the consultation process and to define the necessary actions, as well as resources and timelines that will be required to achieve progress.

3.1.1 Participants

The process of updating the Country Document was inclusive and participatory, under the leadership of the entity with responsibility for coordinating the national disaster risk management (DRM) system, that is, the NEMO. The process involved the collaboration of a broad range of actors, including national authorities responsible for DRR implementation in the country, key stakeholders working on DRR in all relevant sectors (such as health, education, planning, housing and development, economic affairs and finance, etc.), technical and scientific institutions, the private sector, civil society, international cooperation agencies, DIPECHO partners, and members of existing DRR platforms, among others. The report on the stakeholder consultations, which can be accessed through the NEMO portal, provides information on the stakeholders consulted.

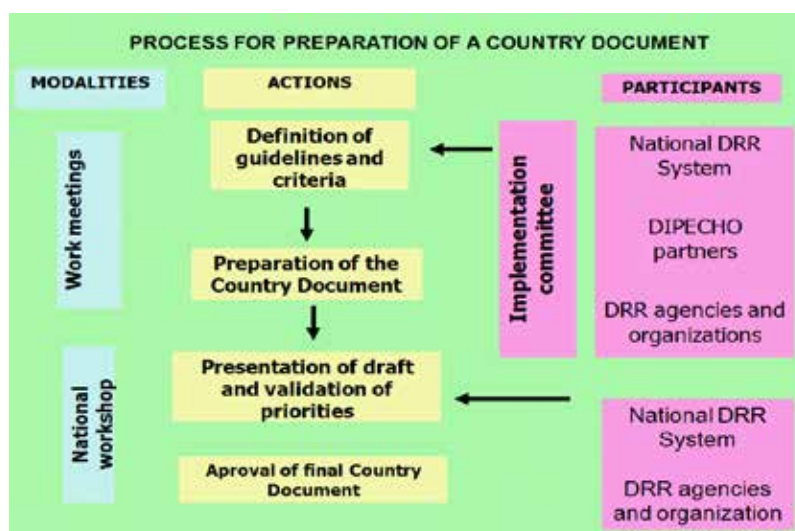


Figure 3.1. Initial Process for Elaboration of Country Document for Disaster Risk Reduction

3.1.2 Modalities

The process of updating the SLU CP-DRR was facilitated mainly through the modalities of desk research, work meetings including focus group discussions and one-on-one interviews, and national workshops involving the participation of all the actors. Other modalities utilized during the process of development of the document included telephone discourses and the use of other e-media, such as e-mail and Skype. Two broad-based national workshops were held in the north and south of the island respectively on October 7th and 9th, 2014, to obtain feedback at the policy, technical and community levels for validation and finalization of the draft Updated Country Document.

A revised version of the CD-DRR, incorporating the recommendations from the national workshops, was submitted to the UNISDR Regional Liaison Officer in Barbados, the UNISDR Project Coordinator - Regional Office for The Americas, and the Director of the NEMO, for further review and feedback. A final draft of the document incorporating feedback received was subsequently submitted to the NEMAC electronically, and a hard copy of the Executive Summary and a ballot form requiring signatures indicating final approval, was circulated to same.

The acceptance of the CD-DRR by the NEMAC as a nationally approved document assures the speedy approval of the Document by the Cabinet of Ministers by end of year 2014.

3.1.3 Information Needs

Information requirements for the updating of the CD-DRR for Saint Lucia included reports, data and information on the state of disaster risk and the management of risk reduction at the national level. Key information sources with regard to knowledge, experience, and perceptions of the national system for DRM, platforms or committees participating in the process of CDM and HFA progress reporting and background documents used to inform the updating of the SLU CD-DRR, have been compiled to contribute to a repository for DRR information.

3.1.4 Phases of the process

The three-stage process, recommended in the standardised format and guidelines for elaboration of the first Country Document (SLU CP-DRR), was adopted with slight variations in the actions within the stages. These comprised:

- First Stage: Planning
- Second Stage: Participatory updating of the Country Document
- Third Stage: Consultation and approval

3.1.5 Actions undertaken

The following were the actions undertaken at each stage:

First Stage - Planning:

- I. Preparation of the work plan and schedule.
- II. Identification and contact with participants and key stakeholders.

- III. Adaptation of *“Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean”*¹⁸.
- IV. Definition of methodological aspects: issues for analysis and the design of tools for information synthesis and analysis.

Second Stage - Joint updating of the Country Document:

- I. Information gathering from direct and indirect sources.
- II. Consultations/work meetings to gather additional information and recommendations.
- III. Synthesis of the information compiled.
- IV. Analysis of the information.
- V. Updating of the Country Document.

Third Stage - Consultation and approval:

- I. Presentation of the draft Updated Country Document to key stakeholders.
- II. National workshops to validate and gather final inputs.
- III. Endorsement and approval of the Country Document by NEMAC and Cabinet of Ministers.

3.2 ASSUMPTIONS AND LIMITATIONS

The main assumptions made in undertaking the assignment were as follows:

- Information and data would be accessible, readily available, in usable formats, and where necessary be up-to-date.
- There was sufficient level of sensitization and awareness, and understanding of DRM issues and DRR concepts, to generate ownership of and obtain buy-in for project implementation, which would be demonstrated in commitment and cooperation towards project implementation. This in turn would allow for the full range of information to be gathered in order to undertake as comprehensive a review and updating as possible.
- Stakeholders would be willing to share information, and where information gaps existed would assist in generating the required information through other means.
- Using a participatory approach to ensure a shared vision on the project’s direction, methods and results would lead to better stakeholders’ understanding of the project and its benefits and help overcome any skepticism with regard to unfamiliar aspects of project implementation.
- The outcomes of the risk assessments and application of the *“Criteria for Identifying Key Actions for Disaster Risk Reduction (DRR) Planning in Latin America and the Caribbean”* would provide a reasonable basis for determination of DRR priority areas and design of strategies.

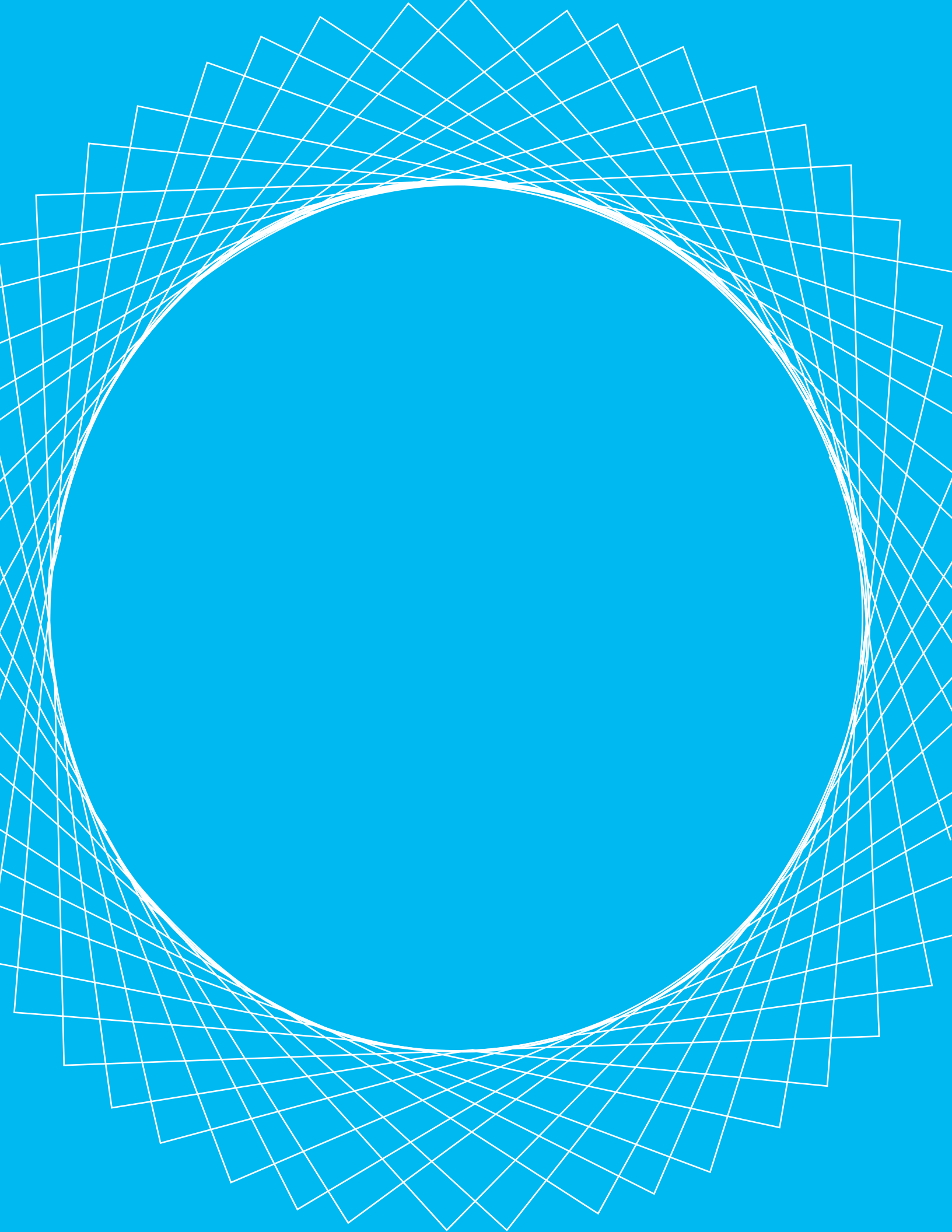
These assumptions in conjunction with the following limitations would have impacted the quality of the output:

- An apparent pervasive culture of a reluctance to share information, particularly within the national realm, hence difficulty in obtaining relevant information/documents from some key stakeholders.
- An inadequate research and systematic observation framework, resulting in an inadequacy of data to support the process.

¹⁸ Version updated in 2014 with a more sub-national focus.

- The inadequacy of the existing information, with regard to the level of coverage, currency and the availability of data in varying formats and at varying scales of capture.

To overcome most of these limitations and to permit the timely undertaking of comprehensive assessments within the given time frame, the Consultant had to adapt the methodology in order to collect substitute/ alternative data and information. The intent was to attain the best possible level of accuracy through the innovative use of the existing information supported by anecdotal evidence and expert judgment from the consultative process.



4. International and Regional context for DRR

4.1 INTERNATIONAL DRR CONTEXTII

The definition of an international context for DRR began with the UN International Decade for Natural Disaster Reduction (IDNDR), during the 1990s, which prompted governments, donor agencies and other key players to begin to emphasize mitigation and “comprehensive disaster management”. As a follow-up of the IDNDR, the *United Nations International Strategy for Disaster Reduction* (UNISDR) was adopted by the member states of the United Nations in 2000, in an effort to ensure the implementation of the “*Yokohama Strategy and Plan of Action for a Safer World*” which had been adopted since 1994. This strategy aims to achieve substantive reduction of disaster losses and build resilient communities and nations, as an essential condition for sustainable development.

Other global platforms and strategies which define the context for DRR include the European Community Humanitarian Organization (ECHO), which recognizes disaster preparedness and prevention within its mandate for humanitarian aid and the more recently, the *Hyogo Framework for Action (HFA) 2005–2015: Building the Resilience of Nations and Communities to Disasters*,¹⁹ among others. The goal of the HFA is “the substantial reduction of disaster losses, in lives as well as the social, economic and environmental assets of communities and countries” and is the reference framework for DRR public policy.

The Global Platform for Disaster Risk Reduction²⁰ is also an international element of the ISDR System. It is responsible for raising awareness and reiterates commitments, for sharing experience on implementation among stakeholders and Governments, addressing gaps, and for providing strategic guidance and coherence for implementing the HFA. The *Children’s Charter for Disaster Risk Reduction developed for Africa, Asia and Latin America and the Panama Declaration on Disaster Risk Reduction*²¹ have also served to advance initiatives for disaster risk management in the education sector.

Recent World Disaster Risk Reduction Campaigns such as “Disaster risk reduction begins at school” (2006-2007), “Hospitals safe from disaster” (2008-2009), “Making Cities Resilient – My city is getting ready!” (2010-2015), all of which follow on the themes of the previous campaigns through the global advocacy initiative called “One Million Safe Schools and Hospitals”, are also contributing to the dialogue on DRR.

The international context for DRR is also enshrined in agreements such as the *Johannesburg Declaration, Mauritius Strategy for Implementation* (MSI) of Agenda 21, and the *Millennium Declaration* and Millennium Development Goals (MDGs), which are driving development aid and development agendas worldwide. Reducing disaster risk is deemed necessary to achieve the MDGs, particularly those related to poverty

19 <http://www.unisdr.org/hfa>

20 The Global Platform for Disaster Risk Reduction is replacing the Inter-Agency Task Force with its same mandate and open-ended participation by Member States. www.preventionweb.net/globalplatform

21 The Children’s Charter for Disaster Risk Reduction was launched during the Global Platform for Disaster Risk Reduction held in May 2011 in Geneva. See: http://www.childreninachangingclimate.org/database/CCC/Publications/children_charter.pdf

reduction and environmental sustainability. Saint Lucia is also committed to the implementation of the Barbados Programme of Action (BPoA)²¹. The BPoA and the MSI underscore the particular vulnerability of SIDS in the face of climate change and outline specific response measures to be taken at global, regional and national levels.

Saint Lucia is also a signatory to the United Nations Framework Convention for Climate Change (UNFCCC) and several other multi-lateral agreements such as United Nations Convention for Combating Desertification – Land Degradation (UNCCD), and United Nations Convention on Biodiversity (CBD), which in one way or the other will impact on how DRR concepts are implemented.

4.2 REGIONAL CONTEXT FOR DRR

The Caribbean Community (CARICOM) development agenda is based on sustainable development, which encompasses economic, social, environmental and governance dimensions, with the sub-regional development agenda of the Organization of Eastern Caribbean States²³ (OECS) further espousing the sustainable development agenda within the dimension of human development. The BPoA calls for the integration of natural and environmental disaster policies into national development. The *St George's Declaration of Principles of Environmental Sustainability (SGD) in the OECS* (1979), embodies the commitment of governments of the Eastern Caribbean to “environmentally sustainable development as essential for the creation of jobs, a stable society, and a healthy economy”, and by extension, speaks to disaster risk reduction and reducing the adverse impacts of climate change.

Like in most Caribbean SIDS, the last two decades, have seen radical changes in the policy environment for the region, where issues of disaster risk management (DRM) and DRR were not seen as priority, to where the linkages between DRM and development are being explored in the context of all of the three components of sustainable development: economic development, social development and environmental protection. DRM has slowly begun to infiltrate the various spheres of public policy, programmes and plans. The work of intergovernmental bodies such as the Organisation of American States (OAS), the Organisation of Eastern Caribbean States (OECS), and the Caribbean Disaster Emergency Management Agency (CDEMA), is particularly noteworthy in this regard. The OAS/USAID Caribbean Disaster Mitigation Project (CDMP) in 1993 was one of the first of its kind in the region. In addition, the *Kingston Declaration* (2005) purposed to improve DRM capabilities in the region, while the *Saint Marc Plan of Action*, an agreement of the Association of Caribbean States (2007) gives cognizance to disaster reduction as an important element in the achievement of the Millennium Development Goals, particularly with respect to poverty reduction and environmental sustainability; as well as in the adoption HFA.

Of particular importance is the Comprehensive Disaster Management (CDM) Strategy and Programming Framework, conceptualized for the Caribbean in 2001, by the Caribbean Disaster Emergency Response Agency (CDERA). Comprehensive Disaster Management expanded the focus of disaster management from the prevailing relief and response mode to include disaster risk mitigation considerations into the planning and development stages, and expanded the range of partners in the DRM framework to facilitate this. The

22 The Programme of Action for the Sustainable Development of Small Island Developing States (BPoA) adopted at the SIDS conference in Barbados in 1994, sets forth specific actions and measures to be taken at the national, regional and international levels to support the sustainable development of Small Island Developing States (SIDS).

23 The mission of the OECS is: “To be a **Center of Excellence** contributing to the sustainable development of OECS Member States by supporting their strategic insertion into the global economy while maximizing the benefits accruing from their collective space.”

Enhanced CDM Framework (2007-2012), followed by the Regional Comprehensive Disaster Management (CDM) Strategy and Programming Framework (2014 – 2024)²⁴, reoriented the focus to “building resilience of nations and communities to hazard impacts”, through the expansion and replication of several on-going best practices in the following priority areas:

- a. Hazard mapping and vulnerability assessment
- b. Flood management
- c. Community disaster planning
- d. Early warning systems
- e. Climate change adaptation
- f. Knowledge enhancement

The *Regional Framework for Achieving Development Resilient to Climate Change* (2009-2014) also establishes the direction for the continued building of resilience to the impacts of GCC by CARICOM states and is aimed at building mechanisms to systematically address development challenges posed by climate change. The Framework builds on the significant contributions of projects such as Caribbean Planning for Adaptation to Climate Change (CPACC), Adaptation to Climate Change in the Caribbean (ACCC) and Mainstreaming Adaptation to Climate Change (MACC) and Special Adaptation to Climate Change - Implementation of Pilot Adaptation Measures in Coastal Areas (SPACC).

Regional Platforms for Disaster Risk Reduction are also promoted by the UN/ISDR Secretariat and partners for information sharing and coordination among existing bodies. The 2013-2014 DIPECHO Action Plan for the Caribbean aims to establish greater collaboration and coordination between partners, allowing programming of common outcomes and the harmonization of practices. Furthermore, it focuses on improving communication and dissemination of Disaster Risk Reduction (DRR) key contributions in the region, by capturing evidence of success on how DIPECHO projects have allowed the most at risk communities to anticipate, withstand, adapt and sometimes, recover quickly from disasters. Under the DIPECHO Action Plan for the Caribbean 2013-2014, countries are to prepare/update country documents for disaster risk reduction (DRR).

Also of particular note is the sectoral work carried out with regard to evaluation of disaster risks in sectors such as health and education, with the use of tools such as the *Health Sector Self-Assessment Tool for Disaster Risk Reduction*²⁵, which was developed based on a regional survey to determine where countries in Latin America and the Caribbean stood in terms of disaster preparedness, mitigation and response.

4.3 NATIONAL DRR CONTEXT

Primary agreements which underpin disaster management at the national level include:

- a. Articles establishing the Caribbean Disaster Emergency Management Agency (CDEMA)
- b. International Ship and Port Facility Security Code (ISPS Code)
- c. Association of Caribbean States (ACS)- Agreement to Create the Special Committee on Natural Disasters

24 www.cdema.org/CDMStrategy2014-2024.pdf

25 http://new.paho.org/disasters/index.php?option=com_content&task=view&id=1443&Itemid=807

- d. Memorandum of Understanding between International Federation of Red Cross (IFRC) and Red Crescent Societies (RCS) and United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in regards to the International Federation assuming a Leading Role in Emergency Shelter in Natural Disasters.

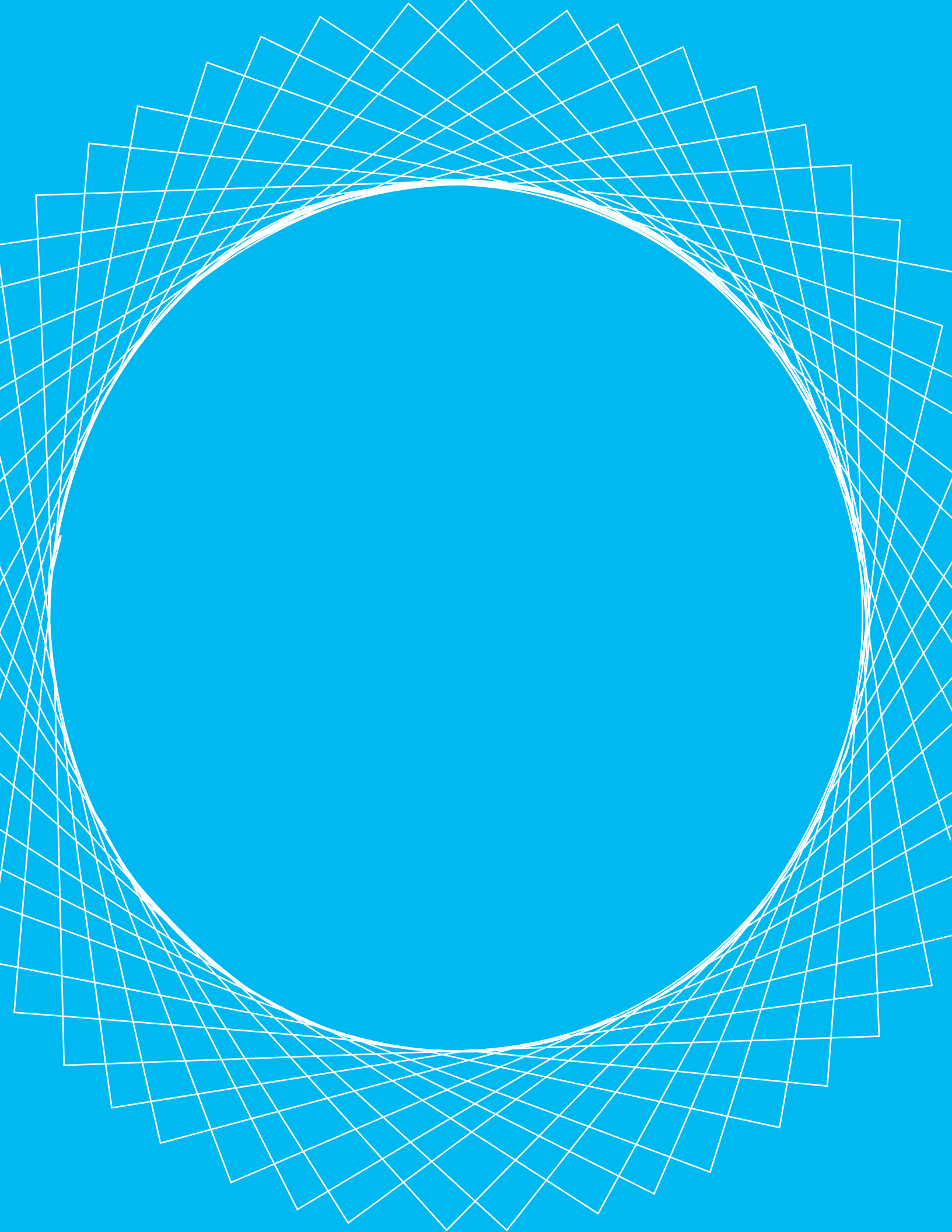
Further, the country is signatory to approximately twenty-six (26) multilateral environmental agreements, many of which have implications for DRR, particularly in sectors such as agriculture, fisheries, forestry, health, and sustainable development. A compilation of key agreements and instruments, the focal agencies/points and the particular relevance of the agreement/instrument to the current disaster management framework is presented in the NEMP.

In 2004, the country approved the formulation of an environmental policy as the key mechanism for implementation of the SGD. The National Environmental Policy (NEP) and the National Environmental Management Strategy (NEMS) surpassed the SGD, incorporating all other related policies, plans, programmes and strategies, including those developed under international and regional agreements. Hazard risk management is also a key element of the NEMS. Also worthy of note, is that as far back as 2004, the country had begun the process of promoting Integrated Development Planning (IDP) and had formulated a preliminary set of indicators in this regard.

As part of the UN/ISDR systems, a National Platform for Disaster Risk Reduction has been initiated for implementation of the HFA, 2005-2015, with the Director of the NEMO as the National Focal point. The HFA is intended to assist efforts at the national and community level for resilience building in order to better cope with the hazards that threaten development gains. To date however, the main activity has been the compilation of HFA progress reports.

The National CDM Strategy and Framework is a derivative of the Regional Enhanced CDM Strategy and Programming Framework which is explicitly connected to all of the above mentioned international and regional agreements, strategies and platforms, including the HFA.

The means to better facilitate international support for DRR at the regional and country levels are now imperatives. Experience to date indicates the need for greater effort to improve at the national level, coordination among national agencies/organizations and regional cooperation agencies to develop synergies and the development of a more holistic understanding of disaster risk reduction, environmental management and sustainable development, and their interaction.



5. National Context and DRR legal, normative and institutional framework

This chapter briefly describes the country's physical characteristics, climate and demographics, followed by an overview of the socio-economic situation under which the updated DRR-CD was prepared. The chapter also includes an outline of the normative framework of the country for DRR, with a particular focus on organizational levels and coordination mechanisms between state and non-state actors. The chapter provides the background against which the analysis of disaster risk and vulnerability and adaptation is to be addressed for the updated DRR-CD.

5.1 PHYSICAL ENVIRONMENT

5.1.1 Geographic location

Saint Lucia is situated in the Lesser Antillean Arc of the Caribbean Archipelago at latitude 13° 53' north and longitude 60° 68' west and situated on a volcanic ridge between Martinique to the North and St. Vincent and the Grenadines to the south (**Figure 5.1**). The island is 42 km long, 22 km wide, and has a land area of 616 km², and is characterized by mountainous and rugged topography, with steep slopes cut by fast-flowing rivers.



Source: Google Earth

Figure 5.1: Saint Lucia Map and Location in the Caribbean Archipelago

5.1.2 Physiography

Saint Lucia is characterized by very rugged topography, with a central ridge of mountains, including Mount Gimie, the highest peak at 950m, and numerous steep off-shoot ridges extending towards the coast.

The island comprises thirty-seven (37) main watersheds²⁶; ten of which are small multiple drainage basin complexes²⁷ (Figure 5.2). They all radiate from the central mountain ranges of the interior towards the coast, and activities occurring in one area can very rapidly have negative environmental impacts on surrounding ecosystems and in particular, changes taking place in upper watershed areas very rapidly impact on lower watershed and coastal areas. Within these watersheds, twenty-five (25) water catchments are harnessed for domestic water supply²⁸, with most of the water consumed or used on the island coming from runoff from catchment areas in the upper reaches of seven (7) catchments which have their headwaters mainly in the mountainous south-central area of the island.

The island's soils have been divided into three mineralogical groupings²⁹, allophanes, kaolinities and montmorillonites. The allophone group is representative of younger soils and occupies the highest rainfall areas particularly in the south. Kaolinitic soils occupy the older land surfaces in high rainfall areas in the north and finally, the montmorillonites are located in the drier and some intermediate areas. The interior soils tend to be inherently more stable to surface erosion (good aggregation on account of the extent of weathering), but are easily degraded once the forest cover particularly on steep slopes are removed. The montmorillonitic (expanding lattice) clays dominate the thin soils around the coastal areas and are highly erodible once the vegetation is disturbed.

As a result of the rugged topography and the absence of intermediate collection points for surface water, such as lakes and ponds, the majority of rainfall flows to the sea with very little opportunity for ground water storage. The natural forested areas make a significant contribution to the interception of this rainfall, allowing infiltration into the sub surface, thereby contributing to the sustaining of base flows in the river systems beyond the rainy periods.

Approximately 30% of Saint Lucia's land area is pastoral and arable land with less than 10% of the total land area occurring on slopes of less than five (5) degrees³⁰. As a result, the application of some type of soil conservation measure is necessary on more than 90% of the land area for any type of use³¹.

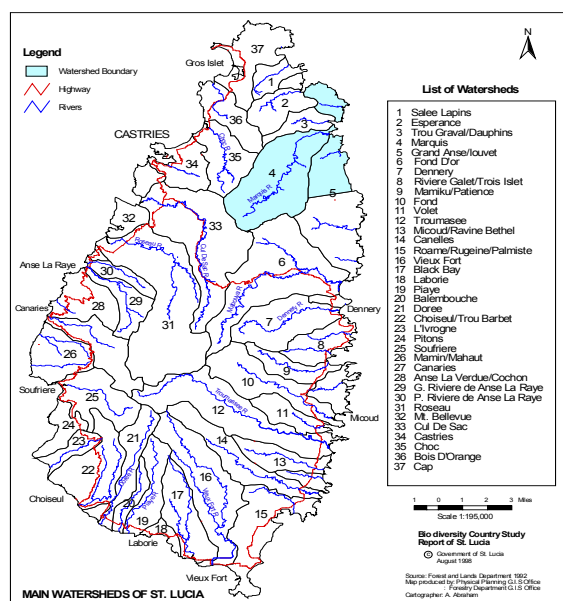


Figure 5.2. Watersheds and Rivers in Saint Lucia

Source: Biodiversity Country Study Report

The forest reserves are regarded as exceptionally well preserved in the country, comprising mainly rainforest ecosystems. Preliminary findings from the National Forest Demarcation and Bio-Physical Resource Inventory Project (2009) demonstrate the diverse forest types (habitats) in Saint Lucia and large variety of biodiversity which they support, as well as the protection afforded to the island's water resources. Between 1990 and 2000, it is estimated that the island lost 36% of its forest cover as a result of clearing of natural vegetation for agriculture, construction and other development purposes³². Current efforts are focused at increasing this cover within the Government Forest Reserve (protected forests), in an attempt to redress this loss.

The combination of the steep topography and young volcanic soils, constantly subjected to seasonal high rainfall, make the island very susceptible to soil erosion. Vulnerability to disasters such as landslides is further exacerbated by poor land management practices. In addition, the narrow coastal strip which circumscribes the island is characterized by concentrations of haphazard and unplanned human settlement and other development, posing a growing threat to the sustainability of the fragile terrestrial, coastal and marine ecosystems. For example, coral reefs in Saint Lucia are under threat from high levels of sedimentation and other land based pollutants, with an average loss of 47% of coral reef cover in shallow waters and 48% in deeper water observed between 1995 and 2001 in reefs along the central west coast, particularly those bordering the town of Soufriere. Near shore fisheries are also threatened³³.

5.1.3 Climate and Weather

Saint Lucia experiences a tropical maritime climate. Located within the north-east Trade Wind belt the island is normally under an easterly flow of moist, warm air with an average temperature of 27°C (79° F) and relative humidity of 75%. Temperatures rarely rise above 33° C or fall below 20° C³⁴. The highest temperatures are recorded around August to October, and the lowest in the months of January to March.

The amount of daily sunshine received over Saint Lucia is at a maximum from February to May and at a minimum around September. Radiation values vary widely over the island and this is mainly due to cloud cover. As such, elevated regions with greater cloud cover receive less direct radiation than the low-lying coastal regions.

The island experiences two climatic seasons, a wet season which extends from June to November, while the dry season runs from December to May. Tropical disturbances (waves, depressions, storms, hurricanes), account for the greater amount of the recorded rainfall during the rainy season. Local convectional showers and other weather systems account for the remainder. Rainfall amounts show annual and spatial variation with the orographic effects quite pronounced as illustrated in **Figure 5.3**³⁵. Mean annual rainfall varies from 1,450 mm in a relatively flat coastal region such as Hewannora in the south, to 3,450 mm to an elevated interior region such as Edmond Forest³⁶.

32 GOSL, 2008. Water Quality Monitoring Report for Selected Areas, prepared by Susanna De Beauville.

33 *ibid*

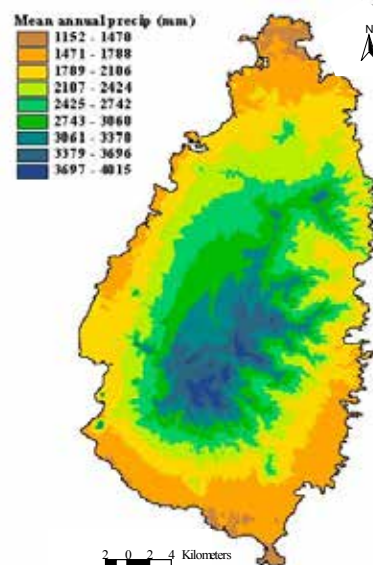
34 Cited from Saint Lucia's Second National Communication (SNC) to UNFCCC (2010).

35 Isaac C. and C.P.A. Bourke. 2001. Ecological Life Zones of Saint Lucia. *Global Ecology and Biogeography*. Vol. 10. Issue 5.

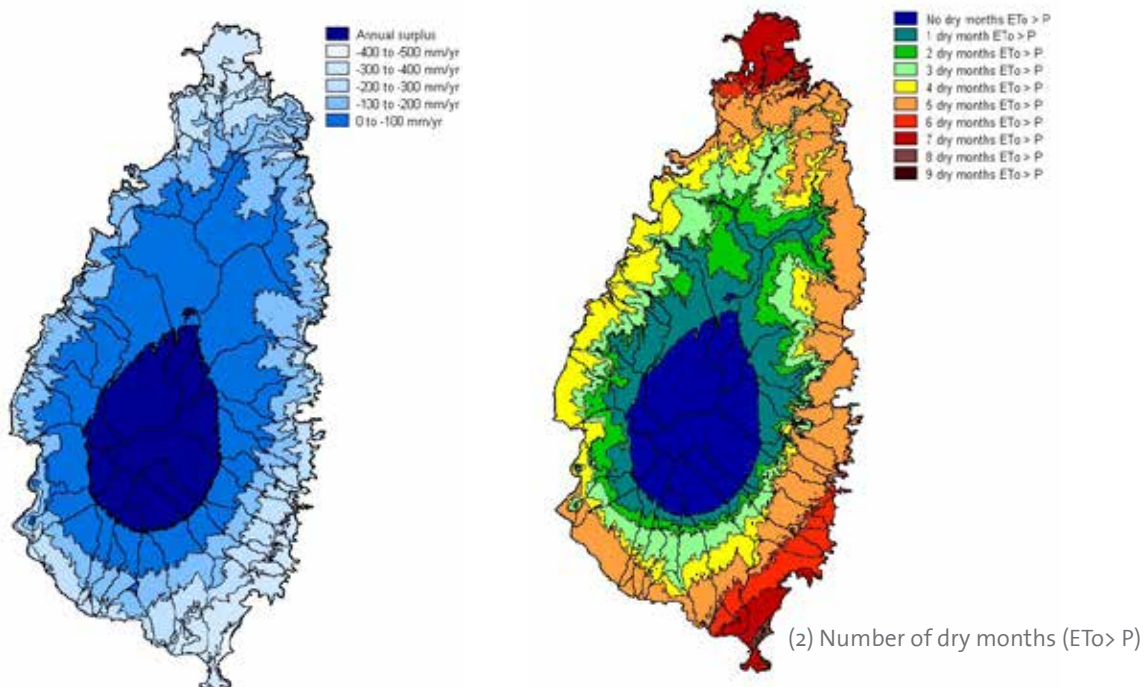
36 Cited from Chase, Vasantha, Luvette Louisy and Martin Satney, 2008. Watersheds in Saint Lucia: Trends and Issues. SFA 2003 - Economic and Agricultural Diversification and Poverty Reduction through Integrated Natural Resources Management (INRM-SFA2003) (INRMP). Financing Agreement EuropeAid/119973/C/SV/LC.

Wind speeds are highest on average during the months of January to July, when the average is 24 km h⁻¹. Between August and December the speeds are less, averaging 16 kmh⁻¹. Higher gusts are occasionally experienced with the passage of tropical disturbances and cyclones.

Figure 5.4 shows spatial distribution of areas with high annual cumulative moisture deficit and number of dry months. These scenarios, against the backdrop of un-sustained river base flows, have serious implications for the island’s water supply, in terms of water availability at both the community and national level. A further aggravation with regard to the national water supply are the various kinds of activities³⁷ taking place in upper watershed areas, which continue to rapidly impact on lower watershed and coastal areas, and have negative environmental impacts on surrounding ecosystems, in particular, the quality of surface water.



Source: Isaac & Bourque, 2001
Figure 5.3 Spatial Distribution of Mean Annual Rainfall for Saint Lucia



Source: Cox, Christopher, A. 2003.
Figure 5.4 Estimated Annual Water Deficit Distribution for Saint Lucia

37 These include among others, unsustainable agricultural practices, unplanned human settlements and poor solid waste management.

5.1.4 Climate Change

Global Climate Change (GCC) is considered one of the most serious threats to the sustainable development of SIDS in the Caribbean and the projected impacts are expected to be devastating. The main impacts of climate change identified for Saint Lucia include changes in precipitation patterns manifested in longer dry spells (droughts), excessive rainfall (flooding) causing landslides, more intense storms, increased hurricane intensity, excessive heat and storm surge, especially due to hurricane activity, with storm surges expected to exacerbate with sea level rise. Climate change projections for Saint Lucia have been prepared by the Climate Studies Group of the University of the West Indies (UWI) and are based on regional climate change models³⁸. Predictions include a decrease in annual rainfall; increase in frequency of Category 4 and 5 hurricanes from 1.4 to 3-4 per year by 2025; more severe droughts; despite less rain overall, more rain during storms; among others.

It is well recognized that the special characteristics of small islands like Saint Lucia, already pose serious challenges to the attainment of sustainable development. Among these characteristics are relatively small size; an open economy with a negative balance of trade; a limited natural resource base; fragile ecosystems; limited human capacity and resources; limited technological capability; and low adaptive capacity. These characteristics also make these islands inherently prone to the large range of potential impacts from climate change. Climate change has to be recognized as a major concern with respect to food security, water resources, natural resources productivity and biodiversity, human health, desertification, and coastal zones. The unavoidable consequences of climate change are further coupled with the fact that the majority of the country's human settlements and centres of economic activity are located in the coastal lowlands³⁹, and over 28% of the population is economically and socially vulnerable - under the poverty line.⁴⁰

The onset of the climate change phenomenon thus imposes new hazards on Saint Lucia and exacerbates the impacts of existing hazards. Climate change is thus expected to bring enormous and unpredictable impacts, likely to trigger disasters that have cross-cutting and multi-sectoral impacts.

5.1.5 Biodiversity

Saint Lucia possesses a high degree of diversity not only in the ecosystems and habitats found on the island, but also in the variety of biological resources present, some of which are endemic to the country. The island's rich biological resources are, in the main, important for food, livelihoods, industry and other ecosystem services, and are therefore, critical for human well-being and socio-economic development. Forest and wildlife resources in particular are important for the variety of products and services which they provide and that support the spectrum of social and economic activities⁴¹ of the island including the conservation of water and soil resources, providing key habitat protection for terrestrial biological diversity, timber and non-timber forest products (NTFPs) and increasingly an important contributor to the tourism sector through ecotourism.

38 GOSL, 2009. Saint Lucia: Current Climate, Future Projections. Prepared by the Climate Studies Group Mona, Department of Physics, University of the West Indies, Mona Campus, Jamaica; for Second National Communication Project of the Sustainable Development and Environment Division, Ministry of Physical Development and the Environment, Saint Lucia.

39 The high vulnerability of coastal communities to GCC and sea level rise seen in inundation of coastal areas; loss of land, habitat, and ecosystems, as well as ecosystem services and consequently socio-economic losses: including reduction of access to communities; threats to sanitation and health; abandonment of community infrastructure; reduced investment on coastal areas; loss of life and livelihoods; and, loss of traditional values and resources.

40 GOSL, 2005/2006. Saint Lucia Poverty Assessment Report. Prepared by Kairi Consultants.

41 UNDP, 2010. Importance of biodiversity and ecosystems in economic growth and equity in Latin America and the Caribbean: an economic valuation of ecosystems.

With the exception of the rainforest and montane forest formations, terrestrial environments are significantly impacted by human activity. Loss of large tracts of land, especially forest lands, due to landslides associated with climate related events contribute to habitat loss and fragmentation, and overall biodiversity loss.⁴² Hurricane Tomas in 2010⁴³ demonstrated that deforested areas are of high risk by both landslide and flow slide. The resultant soil erosion and land degradation were perceived as major causes of biodiversity loss. Increasing incidence of wildfires is also a concern for forest biodiversity loss.

Climate change has also impacted biodiversity and its ultimate contribution to human well-being and socio-economic development through changes in flowering seasons for agricultural crops which have been observed as well as coral reefs bleaching in some areas of the country. Nutrient pollution has also been observed to affect freshwater aquatic species and marine life (GOSL, 2009)⁴⁴.

Additionally, invasive alien species (IAS) are now globally recognised as the second most important threat to biodiversity and also impose enormous costs on agriculture, forestry, fisheries, and other enterprises, and on human and animal health, as well as ecosystem services. Rapidly accelerating trade, tourism, transport, and travel – the infamous “four (4) Ts” - over the past century have dramatically enhanced the spread of invasive species, allowing them to surmount natural geographic barriers.⁴⁵

5.2 SOCIO-ECONOMIC CONTEXT

5.2.1 Population and demographics

Saint Lucia’s population is predominantly of African and mixed African-European descent, with small East Indian and European minorities. The estimated population for Saint Lucia stated in the 2010 Census was 166,526, with 51.1% female and 48.9% male. The population distribution by age reveals 24.1% of the population under 14 years and 33.3% between 14 and 34 years, indicating that Saint Lucia has a youthful population. Persons over 60 years make up 8.6% of the population, with 75% of this age group being female. Saint Lucia’s island wide population density is approximately 796 persons per square mile, with large segments of the island’s population located along the coastal belt, where low land agriculture, coastal resources, reefs, fisheries and tourism are the main sources of livelihood.

Approximately 60% of the population resides along the north-west corridor. The island’s population is rapidly becoming urbanized, with approximately 41% of the total population residing in the city of Castries and 55% of the population residing in the Castries-Gros Islet corridor (**Figure 5.5**).

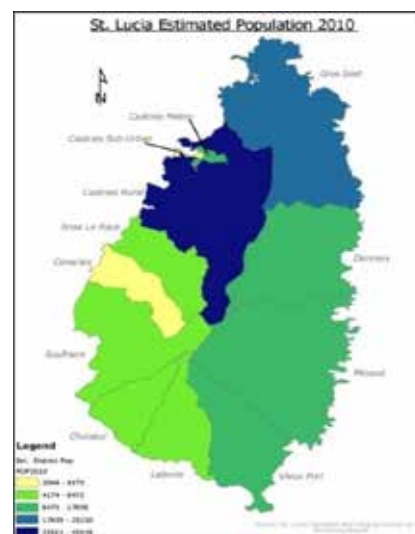


Figure 5.5 Saint Lucia Population 2010
Source: Population Census Report 2010

42 GOSL, 2014. Revised 2nd National Biodiversity Strategy and Action Plan, prepared by Agrico Ltd.

43 UNECLAC, 2010. Macro Socio-Economic And Environmental Assessment Of The Damage And Losses Caused By Hurricane Tomas: A Geo-Environmental Disaster Towards Resilience.

44 GOSL, 2009. Saint Lucia’s Fourth National Report to the Convention on Biological Diversity. Saint Lucia.

45 Krauss, Ulrike, 2010. Critical Situation Analysis (CSA) of Invasive Alien Species (IAS) Status and Management, Saint Lucia. Carried out under the project Mitigating the Threats of Invasive Alien Species in the Insular Caribbean Project No. GFL / 2328 – 2713-4A86, GF-1030-09-03. Forestry Department Ministry of Agriculture, Lands, Forestry and Fisheries (MALFF) Union, September 2010.

The rapid urbanization of the former rural areas of the island, with denser populations living in unplanned or informal settlements and has led to increased risks with regard to natural and man induced disasters.

5.2.2 Socio-Economic Status

Table 5.1: Saint Lucia at a Glance, provides some key social and economic indicators of performance.

Table 5.1 Saint Lucia at a Glance

Population		165,595			
Area		616km ²		Habitable Area	539.1 km ²
Basic Demographics			Population Density		Urban Population
Birth Rate (per 1000)	13.1		Per sq. km - 839.2		2008 - 41%
Death Rate (per 1000)	7.7				2010 - 74%
Infant Mortality Rate	13.43				Avg. Annual Growth 2004 -2010
Structure of Economy			Age Structure		
%GDP (2010 est.)			0-14 years: 24.4% (male 20,035/female 19,021)		
	2000	2009	2010	15-64 years: 66.4% (male 51,593/female 54,843)	
Agriculture	7.0	4.2	3.2	65 years and over: 9.2% (male 6,668/female 8,107)	
Industry	19.2	16.7	16.6		
Manufacturing	4.7	4.3	3.9		
Services	73.8	79.1	80.2		
Prices and Employment (2010)			Poverty Statistics (2005/2006 vs 1995)		
Inflation Rate (period average)	1.9%				<u>05/06</u> <u>1995</u>
Unemployment Rate (average)	20.6 %		% poor		28.8 25.1
			% indigent		1.6 7.1
			Rural Poverty		29.6% -
			Urban Poor		16.3% -
			Vulnerability		40.3% -
School Enrolment (2010)			Central Government Fiscal Operations (MEC\$) FY10/11		
Primary School Enrolment	18,594		Total Revenue and Grants		858.3
Secondary School Enrolment	15,655		Current Revenue		789.5
Tertiary	2,929		Total Expenditure		1,032.7

Source: Adapted from World Bank, 2010 and PPCR Report, 2011⁴⁶

St. Lucia's economy grew moderately in the last three decades, averaging around 3.5% annually between 1981 and 2013. Real GDP in 2013 is estimated at US\$1.3bn⁴⁷. At the global level, there are a number of externalities that have impacted and continue to impact the island's economy, such as changing trade regimes, rising fuel prices and the international financial crisis.

Global trading arrangements have eroded traditional markets for trade in primary products, (in particular bananas), and cheaper imports continue to threaten local industries and increase the food import bill and balance of trade deficit.

46 Adapted from Sources: World Bank, 2010. Saint Lucia at a Glance; GOSL, 2010. Economic and Social Review; GOSL, 2011. Strategic Plan for Climate Resilience for Saint Lucia.

47 Inter-American Development Bank, 2013. Private Sector Assessment of Saint Lucia.

Over the last two decades, the country's economy has undergone significant adjustment from being agrarian-based to service-based, with the services sector, and in particular tourism, leading economic growth. Manufacturing and industry have remained as important productive sectors. The construction sector too has contributed immensely to GDP and employment. For the foreseeable future, Saint Lucia's economic growth and development will continue to be centered around tourism, agriculture, infrastructural development and commercial sectors, with tourism being at the core of the development thrust.

In recent years, there has been a rapid increase in the exposure of economic assets and earning potential to physical hazards. Consequently, while economic assets and jobs are being created, the risk of losing these economic assets and livelihoods from a disaster is increasing. The country was struck by Hurricane Tomas in 2010 which led to loss of life and significant damage to infrastructure and agriculture. The estimated total damage caused by the storm was 34% of GDP, and the economy has remained fragile since.

Despite the magnitude of potential costs and loss of income, reducing disaster risks is still often perceived as a lesser priority than fiscal stability, unemployment or inflation. Notably, the impact of disasters, when all costs are calculated, can represent major losses for government for example in livelihoods, infrastructure, health, housing and education.

Interestingly, the emerging sectors of banking and insurance, though tied to the international financial systems, and as a result tend to respond to anomalies at the global level, still present opportunities to manage disaster risks through mechanisms for risk transfer, thus assisting in making those key economic sectors more resilient to disaster related impacts.

5.2.3 Human Development (Poverty and unemployment, Education)

Country data in **Table 5.1** also show good social indicators, including low levels of maternal and infant mortality, low fertility, increasing life expectancy, and access to universal primary and secondary education,. However, these exist alongside high and increasing levels of poverty – 25.1% in 1995 and 28.8% in 2005/06⁴⁸, one of the considerable social gaps and deficiencies, primarily in rural areas, and linked to high unemployment and underemployment rates⁴⁹.

Poverty in Saint Lucia has been primarily a rural phenomenon. Poverty data from the Census Report (2010)⁵⁰ show prevalence rates for poverty in excess of 35% in the rural districts of the south and south-west of the island (Anse-la-Raye/Canaries, Choiseul, Vieux Fort), with some pockets in the north-east of the island (**Figure 5.6**). Further, 40.3% of the population was deemed to be vulnerable⁵¹. As in most countries around the world, children bear the brunt of poverty. Over 50% of the

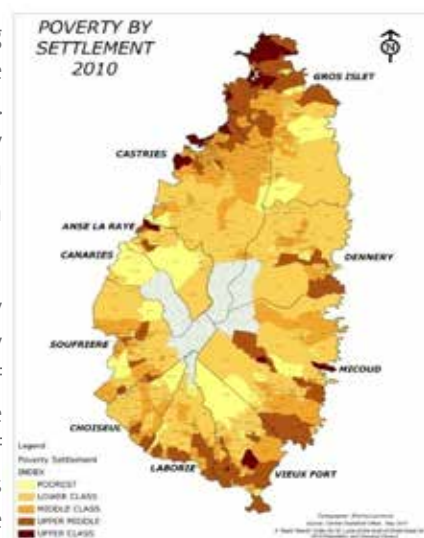


Figure 5.6 Geographic Distribution of Poverty in Saint Lucia

Source: Population Census Report 2010

48 GOSL. 2006. Saint Lucia Poverty Assessment Report, Prepared by Kairi Consultants.

49 The Poverty Assessment (2005/06) identified the ripple effect of decline in banana earnings into other areas of the economy, spreading poverty beyond the agricultural sector and contributing to increased poverty and vulnerability in rural communities.

50 GOSL. 2010. Population and Housing Census Preliminary Report, updated April 2011. Central Statistics Office.

51 Vulnerability in this case measures the proportion of the population that would be susceptible to falling into poverty as a result of an unanticipated event such a natural disaster or adverse economic shock; computed using an estimate of 25% above the poverty line (EC\$ 6,357.50 per annum) as the criterion of vulnerability.

poor are under the age of twenty (20) and the incidence of poverty is higher among children than among adults. The incidence of poverty is slightly higher among men than among women, 29% and 25% respectively. The incidence of poverty among female headed households (21.2%) is about the same as among male headed households (22%).⁵²

Unemployment remains high, particularly among the youth. The economically active population is estimated at one third of the population, with 22% employed in agriculture, 25% employed in manufacturing and 53% in tourism and other services.⁵³ Declines in the key economic sectors, such as agriculture, have also exacerbated the effects of unemployment and poverty, the combined impact of which has contributed to a slowdown in economic activity in Saint Lucia over the last three years.

The country's Education Sector Development Plan (2009- 2014) has placed considerable focus on the quality, relevance and diversification of education. The country has been able to achieve universal primary and secondary education, the latter milestone attained in 2007/2008. The net enrolment rate in public primary schools increased from 88% in 2011/12 to 90% in 2012/13, and there continues to be both under-aged and over-aged students in the primary schools.

In 2010, the net secondary enrolment rate was 90.8% for males and 95.2% for females, compared to a net enrolment rate of 87.7% in 2012/13, with secondary enrolment, especially among boys much lower⁵⁴. An increasing trend in dropout rate, dominated by males has also been registered. Males accounted for as high as 70% of the total dropouts in 2010/2011⁵⁵. Adult literacy stands at 95%⁵⁶.

A positive correlation has been demonstrated with increasing incidence of poverty and increased vulnerability to impacts of disasters and climate change impacts (e.g. rainfall changes, sea level rise and storm surge)⁵⁷. The HFA governance structure also recognizes that issues such as increased population densities, environmental degradation, and global warming, adding to poverty, make the impacts of natural hazards worse.

UN Secretary General Ban-ki-Moon further advanced that *"disasters have the tendency to exacerbate poverty and undermine development planning, particularly poverty reduction strategies"*⁵⁸. Thus, *"addressing disaster risk reduction is inseparable from the broader sustainable development agenda."*⁵⁹ Hence, the interrelationship between poverty and disaster establishes the basis for the identification of potential threats of disaster related impacts to the welfare of the vulnerable segments of the population (e.g. the poor) and implicitly provides a means for addressing issues relevant to disaster management and disaster risk reduction, using poverty reduction platforms.

52 Saint Lucia Population & Housing Census 2010

53 *ibid*

54 World Bank Report, 2012.Trading Economics.

55 GOSL, 2013. Education Statistical Digest, 2013. Available at: <http://www.education.gov.lc/index.php/research-statistics.html>

56 *ibid*

57 See Footnote 9

58 2011. UN Secretary General, Nassir Abdulaziz Al-Nasser, Ban-ki-Moon's address to meeting leading up to Rio+20

59 *Ibid*.

5.2.4 Gender, youth and children

The variety of risks to which the various groups within the rubric of gender, youth and the elderly are exposed, further underscores their high level of vulnerability to the impacts of natural and man-made disasters. These risks range from unemployment, especially among the youth, household vulnerability associated with adult illiteracy, poor housing and sanitation facilities and limited community organizational capacity and household assets to buffer against unforeseen events. Interestingly, such risks tend to be associated with prevailing high levels of poverty and illiteracy. The level of exposure to such risks is more severe among the youth and the elderly population. For example, youth unemployment not only leads to loss in productivity but also to a higher prevalence of youth at risk⁶⁰.

In general, unemployment among women and youth is much higher, than the corresponding level for men, especially those with a primary school education and with few marketable skills. Therefore, it is imperative that due consideration be given to ensuring increased opportunities for the overall participation of women and youth in interventions for DRR.

Notwithstanding the growing trends in the empowerment of women and a seemingly marginalization of males within the country, it has been recognized that men and women are affected differently by socio-economic and cultural factors such as poverty and literacy, and that these may influence their respective roles in responding to the DRR phenomenon. In particular, women, given their multiple roles in society, may bring particular knowledge and experience to bear in adaptation to vulnerability in this regard.⁶¹ Over 40% of households in Saint Lucia are headed by women who have the main responsibility for the economic welfare of their families, participating in the various economic sectors.

However, within the dynamics of gender, similar levels of vulnerability for males and females are being observed, though higher levels of indigence was reported for poor men in at least one community, as residual employment tended to favour females.⁶² Inequities in the distribution and access to health services amongst the various population age groups are also noteworthy.

It has been shown that initiatives aimed at social protection are vital to help build partnerships with organizations involved with gender issues, vulnerable populations and disaster risk reduction. They also help create platforms for development of processes to create disaster resilience that is sensitive to gender and the at-risk/vulnerable populations in the society – children, youth, elderly. Gender-specific causes of poverty and environmental degradation also warrant further study and understanding.

5.3 GOVERNANCE STRUCTURE

5.3.1 Political structure and organisation

Saint Lucia is one of the four Windward Islands and a member of the Organization of Eastern Caribbean States (OECS) and the Caribbean Community (CARICOM). The island gained independence from Great Britain on

60 Aldrie Henry-Lee Ph.D., 2004. *Social Protection and Poverty Reduction in the Caribbean - Examining Policy and Practice*. Saint Lucia Country Review.

61 Worthy of note, is that 2012 International Day for Disaster Reduction (GA resolution 64/200 of 21 December 2009), places the spotlight on women and girls who play a key role in community DRR, by making their communities more resilient to disaster and climate risks and helping to protect development investments.

62 The Social Protection and Poverty Reduction in the Caribbean, Saint Lucia Country Review. 2004.

February 22nd, 1979, but continues to maintain a Westminster style government with a constitution which guarantees human rights and civil liberties and a well-established parliamentary democracy. The country has a multi-party structure, dominated by two political parties, with elections constitutionally due every five (5) years. Its bicameral parliament comprises the Senate or Upper House comprising eleven (11) members⁶³ and the House of Assembly comprising seventeen (17) district representatives selected by popular vote from single-member constituencies.

The Head of State of Saint Lucia is the Governor General, who represents the British Monarch. The administrative arm of Government comprises the Office of the Prime Minister, the Office of the Attorney General and fourteen line Ministries⁶⁴. The current Prime Minister, the Honourable Dr. Kenny D. Anthony, leader of the Saint Lucia Labour Party, was sworn into office following the country's general elections in November 2011. Whereas the Ministerial Portfolios and configurations of the Ministries undergo changes based on decisions of the Prime Minister, certain key portfolios of relevance to Disaster Risk Reduction include NEMO which resides within the Office of the Prime Minister, finance, sustainable development, physical development, legal affairs, infrastructure, agriculture, tourism, health, gender relations, education, commerce and business development. In fact, given the all-encompassing nature of DRR, all the ministries will in some measure play a role in ensuring the effective integration of a DRR approach in national development.

5.3.2 Local government and levels of decentralization

Local government in Saint Lucia is founded upon the Constitution of 1979, which makes reference to the concept of local government but does not specify how local government should be organized. However, a green paper issued in 2000⁶⁵ outlined the importance of citizen participation and devolvement of functions to local authorities.

In 2012, the Constituency Councils Act was passed in Parliament as an interim measure towards local government reform as a follow up to the Green Paper. Under this Act there are 15 administrative divisions within St Lucia and local authorities within the 15 divisions consist of 15 constituency councils.

The Ministry of Social Transformation, Local Government and Community Empowerment is currently in the process of reviewing draft legislation to replace the current Constituency Councils Act 2012. The new Act will address issues relating to the institutional, financial and legislative frameworks of local authorities. This is in an effort to encourage and promote a greater level of public participation and involvement in the affairs of the nation and its development thrust. It is envisaged that the process will be completed in 2015.

The reformation of local government remains an important item for the local agenda in the pursuit of improved local governance, particularly with regard to resourcing local government with the investment capacity and competence to provide adequate support, including institutions, infrastructure and services and regulations for reducing hazard risks.

63 Six members appointed on the advice of the Prime Minister, three on the advice of the Leader of the opposition, and two following consultation with religious, economic and social groups

64 Listing of Ministerial Portfolios can be found at www.stlucia.gov.lc/

65 <http://www.arial-programme.eu/en/pacific/59-saint-lucia.html>

5.3.3 Coordination mechanisms between State and non-governmental actors

Several mechanisms have been established at the national level to facilitate an interface between state and non-state actors to manage aspects of the national development agenda. The Disaster Management Act (2006) established the National Emergency Management Advisory Committee (NEMAC), comprising representatives primarily from public/state agencies, with provision for inclusion of other persons and organizations at the advice of the Minister with responsibility for disaster management. It also provides for the establishment of other committees and sub-committees charged with particular responsibilities, at the directive of the Director of NEMO. Non-state actors such as community-based organizations (CBOs) and the small number of Non-Governmental Organizations (NGOs) are also active participants within the national disaster preparedness and response mechanism, as well as within the environmental management framework.

Other coordination mechanisms have been created at the national level with more broad-based representation across public and non-state actors, especially in the sphere of environmental management, such as the Coastal Zone Management Advisory Committee (CZMAC), Climate Change Coordinating Committee (CCCC), and National Biodiversity Coordinating Committee (NBCC). The Draft Environmental Management Bill (2008) also proposes a National Environmental Commission (NEC) as an overarching agency for environmental management.

The potential of the non-state actors for mainstreaming DRR practices for a resilient economy is however, largely untapped given that the mechanisms for linkages between national level and community level actions are not well developed.

5.4 DEVELOPMENT CONTEXT

5.4.1 National development priorities

Saint Lucia's development agenda is guided by a number of national policy imperatives and instruments, including the country's Medium Term Development Strategy (MTDS), annual Budget Speeches, Annual Estimates of Expenditure (Budget) and Corporate Plans of individual Ministries, and influenced by the international and regional context for DRR.

The country's MTDS, for the period 2006-2011, focused on exploiting opportunities for sustained growth and development and the restructuring and repositioning of the economy for successful integration within an increasingly liberalized international and regional trading environment, in particular the CARICOM Single Market and Economy (CSME) and the OECS Economic Union. The development priorities described in the MTDS are aimed at halting any further decline in the agricultural sector, encouraging agriculture and wider economic diversification, providing an enabling environment to foster increasing returns to the local economy through effective linkages, encouraging education and human resource development, supporting the emerging informatics industry and financial services sector and also encouraging the adoption of appropriate technology as a means of achieving greater efficiency.⁶⁶

Initially, this broad-based Strategy/Plan did not address in a substantive manner the issue of disaster vulnerability and DRR. However, the need to incorporate these considerations in the development planning

66 GOSL Socio-Economic Review, 2011

process became quite apparent in the aftermath of Hurricane Tomas in 2010. To this end, a National Reconstruction and Development Unit (NRDU) was established with a view to strengthening the institutional framework necessary to accelerate the implementation of the developmental plans outlined in the National Vision Plan and related projects.

The development priorities of Saint Lucia provide opportunities for widening the scope of socio-economic and environmental sustainability to incorporate considerations for disaster vulnerability and DRR. While the country's vulnerability to disasters is projected to be exacerbated by climate change, the future vulnerability of Saint Lucia will also depend on its development path. In this context mainstreaming DRR and climate change adaptation into development policies, plans and programs now becomes a pre-condition for sustainable development.

Saint Lucia, like most of the other member countries of the Organization for Economic Co-operation and Development (OECD) continue to report increasing trends in economic losses due to disasters from natural hazards such as hurricanes and climate related extreme events (these affect population, the environment and ultimately the economy). The island is also quite susceptible to the vagaries of international trade, and exogenous economic and financial shocks. Hence economic loss risks can be further increased as a result of economic development pathways. The implementation of risk management strategies aimed at adaptation to climate change and reducing the impacts of disasters is thus critical for protecting health and safety, in terms of human life, livelihoods and the country's natural resources, as well as economic sustainability.

5.4.2 Financial analysis of public investment in DRR

Information on public investment in DRR has not been disaggregated. However, information from key capital projects undertaken with regard to mitigation activities was used as a means to measure the level of public investment in DRR.

Over the last five years, capital investments through World Bank (WB) have been used to fund projects such as the Emergency Recovery & Disaster Management Project (ERDMP) to the sum of USD 0.18 million (EC\$0.49 million), and the Second Disaster Management Project (SDMP), in the sum of USD 0.94 million (EC\$2.53 million).⁶⁷ These have been primarily physical prevention and mitigation works, and strengthening emergency preparedness and early warning systems (**See Section 7.5.2**). The current Disaster Vulnerability Reduction Project (DVRP) aims to measurably reduce vulnerability to natural hazards and the adverse impacts of climate change in Saint Lucia. The major outcomes expected from the project include: (i) capacity built to identify and monitor climate risk at the national level; and (ii) reduced vulnerability of key sectors, assets and people to natural disasters, which will have national benefits, with IDA funding of USD 6-10 million (EC \$ 16 – 26.8 million).⁶⁸

While there is some measure of institutional commitment for investment in DRR, the allocations made by national agencies other than the NEMO, are not considered dedicated DRR resources, and only address some DRR related concerns. Further, these are neither comprehensive nor substantial in nature.

67 Extracted from documents prepared by the Project Coordinating Unit, Ministry of Economic Affairs and National Development.

68 *ibid*

5.4.3 Knowledge and information

There have been several initiatives undertaken on many fronts at the national level, by the NEMO to increase awareness and understanding about disaster risk reduction and resilience building. Public education and outreach (PEO) has spanned a range of target audiences including public and private sector agencies, CBO's, community development organizations (CDOs), and children and schools, among others. A range of tools and communication strategies have also been used in order to engender behavioural change.

The NEMO has also established procedures for the exchange of relevant information during hazard events and disasters, and to undertake post-event reviews. One such system is the establishment of a national Damage Assessment and Needs Analysis (DANA) Committee which feeds into the eighteen district level DANA committees, each of which are responsible for making the required assessments at the district level, pre and post disaster events.

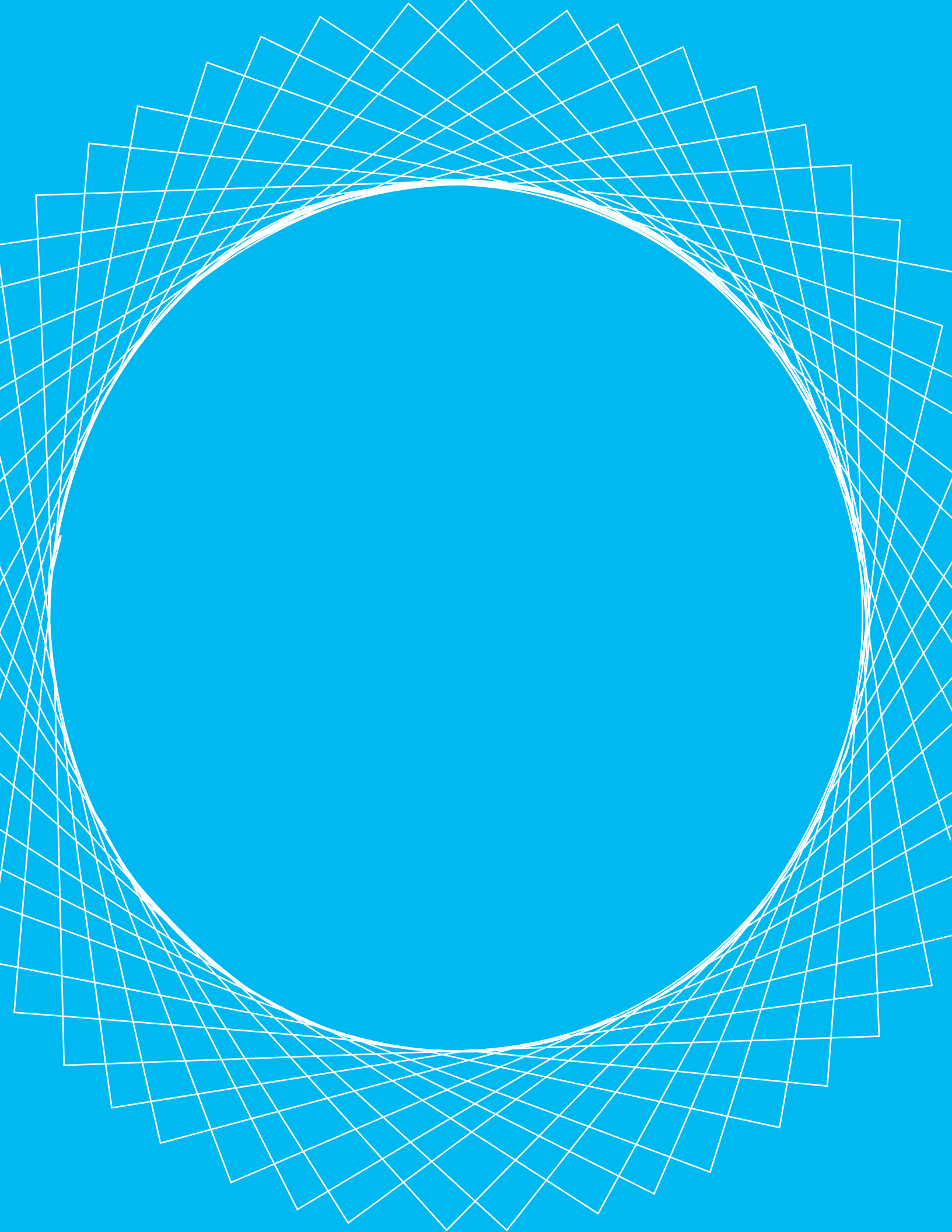
One of the most significant activities to date to promote information sharing and networking has been the introduction of the GeoNode⁶⁹, a data sharing platform established at the national level, under the PPCR project.

One of the major issues though, with regard to the effectiveness of PEO relates to access to information across the various levels of the society. Information generation tends to be project driven and as a result data and information is retained within the domain of the sector or agency with responsibility for the specific project. Further, there are no formal mechanisms to promote information sharing and networking, particularly with regard to key DRR related parameters required for decision support systems pertaining to research and systematic observation (RSO), monitoring, evaluation and dissemination of data and information to undertake proper risk analysis and to engender the behavioural change necessary for the deployment of appropriate DRR measures.

Harmonized and standardized information management systems incorporating appropriate Information and Communication Technologies (ICT) and Geographic Information Systems (GIS) tools need to be developed at the local level, and to be supported by other means for promoting information management at the OECS and CARICOM level. This would facilitate the generation of information such as multi-hazard maps based on more appropriate models; events mapping to validate the same; detailed digital elevation models (DEMs); up-to-date land use maps and proposed development plans to inform decision-making with regard to risk management and the validity and practicality of DRR interventions.

Further, public education and outreach activities need to be organized and conducted in a structured and programmatic way, with clear objectives, targets and goals that deliberately pursue behavioural change, and with greater use being made of experts in the fields of information and communication.

69 <http://sling.gosl.gov.lc/>



6. The DRR legal regulatory and institutional framework

6.1 LEGAL FRAMEWORK

6.1.1 National and provincial constitution

The Saint Lucia Constitution (Order 1978)⁷⁰ and the Emergency Powers (Disaster) Act of 1995⁷¹, vest the authority for declaring a State of Emergency in the Governor General. When a State of Emergency exists, the Governor General is authorised to formulate orders under the provisions of the Ordinance to secure essentials of life to a particular zone, and for the preservation of the health, welfare and safety of the public.

6.1.2 Laws and legal binding provisions

The CDERA model legislation was assented to in Saint Lucia on August 7, 2000. The Disaster Management Act⁷² (DMA) enacted in 2006, subsequently formed the foundation of the legislative framework for disaster management in the country. It provides the laws and regulations that establish the legal authority for the development and implementation of the disaster management programme and organization, and defines the emergency powers, authorities, and the responsibilities of the various parties.

Section 11(3) -- The National Disaster Response Plan shall include – (a) procedures for, mitigation of, response to and recovery from emergencies and disasters by public officers, Ministries and Departments of Government, statutory bodies, local government units, and persons or organization volunteer or are required by law to perform functions related to the mitigation of, preparedness for, response to and recovery from emergencies and disaster in Saint Lucia.

Disaster management and/or DRR related provisions are also defined in some of the legislative instruments in sectors such as health and education, and cross cutting sectors such as water and national security. In most cases these legislation are driven by international obligations. The remit of the Disaster Management Act, also covers provisions for the application of treaties and international agreements. However, this is specific to times of disaster or emergency, during which the Governor General can proclaim it to be part of the law.

The DMA is currently being reviewed to incorporate issues related to Comprehensive Disaster Management (CDM), Climate Change (CC), Mass Crowd Events (MCE), and the articles of incorporation of the CDEMA. Provisions for these types of issues are already covered under the DMA, with focus being on the development of appropriate regulations to give form to how these issues are addressed within the existing legislation.

Other key legislation of importance to the DRR framework included the Physical Planning and Development Act, Land Conservation and Improvement Act and Forest, Soils and Water Conservation Act. Work is also underway on the finalization of an Environmental Management Act (EMA) to incorporate principles of climate change adaptation (CCA). Given the inextricable link between DRR and land development and CCA

70 http://www.preventionweb.net/files/8454_constitution.pdf [PDF 71.06 KB]

71 http://www.preventionweb.net/files/8454_5of95.pdf [PDF 142.25 KB]

72 http://www.preventionweb.net/files/8454_Disaster.Management.Act.pdf [PDF 243.57 KB]

approaches, the EMA presents a major avenue for deriving synergies between DRR and physical planning and development, and environmental legislative framework.

The emerging context for DRR also defines other key considerations in pursuing enhancements to the DMA, which include the country's recent commitments under the HFA, as well as new and emerging DRR related issues, such as tsunamis, maritime emergency, chemical, biological, radiological, nuclear and explosive (CBRNE) events, coastal management, biodiversity and invasive species, sustainable land management (SLM) and forest management, among others, to ensure adherence to international obligations. Other national and sectoral legislation that have implications for DRR will also need to be revised to adequately incorporate the aforementioned issues, to ensure a complementary and harmonized legislative framework.

6.2 NORMATIVE FRAMEWORK

6.2.1 Normative instruments for DRR

The major normative instruments that guide the definition of responsibilities of national and sub-national authorities engaged in DRR are the NEMP⁷³ and the CDM Strategy. The NEMP was first adopted by the Cabinet of Ministers in 1996, with subsequent revisions in 2007, 2009 and further inclusions in subsequent years following annual reviews. It provides guidelines for national coordination of all resources, and the operations and functions of all agencies involved in emergency management as they relate to mitigation, preparedness, response and recovery, and is the official reference in any emergency situation associated with natural or human-induced disasters including technological incidents, on the island. It also describes the overall responsibilities of the NEMO and the role of all concerned sectors, and sets out the administrative mechanisms for carrying out the country's disaster management plan. The areas of prevention and mitigation are not fully developed in the NEMP, though they are referred to in the Annexes to the plan.

The most recent revision of the NEMP (2014)⁷⁴ comprises seven classes of documents, namely:

1. General guidelines
2. Nine (9) Policy Documents
3. Seven (7) Guideline Documents
4. Four (4) Standard Operations Procedures [SOPs]
5. Twenty-six (26) Hazard Specific Plans
6. Seven (7) Sector Response Plans
7. Agreements

These various documents of the NEMP provide the basis for the regulation of activities and the rationalization of local, national, regional and international resources as well as to inform other development planning regulations in this regard.

Also of importance are some key related regulations such as the draft Physical Planning Regulations under the Physical Planning and Development Act; national building codes/standards, and the draft EIA Regulations, which all have significant implications for DRR as it relates to development planning. CCA initiatives, such as

⁷³ The DMA makes provision for the development of regulations to give effect to the purposes of the Act, and for the purpose of implementing the National Emergency and Disaster Response Plan.

⁷⁴ The National Emergency Management Plan (NEMP) and its sections and subsections can be accessed on www.preventionweb.net/english/professional/policies/v.php?id=8436

the development of Engineering Guidelines for Incorporating Climate Change into the Determination of Wind Forces to inform national building codes and standards, are also quite germane to the DRR framework.

Important to note also, are emerging trends in international and regional standards and regulations for operations within certain sectors such as agriculture, tourism, education and health, which have stipulated requirements for disaster risk management such as Sector Disaster Management Plans, Emergency Plans, agricultural health and food safety risks management systems, tourism safety standards, etc. These standards and regulations can also be viewed as risk drivers, and are therefore, critical for the planning, prevention and mitigation aspects of DRR.

6.2.2 Public policy

Saint Lucia has an extensive policy framework to guide national action on a wide range of DRR, and related issues. The process for policy formulation in the country has been an iterative one with policies formulated specific to areas and sectors. However, there has been attempts to address policy formulation in a more holistic way in the area of environmental management, which began with a Legal and Institutional Review of Environmental Management commissioned in 2001 to guide future expansion and strengthening of the legal, policy and institutional arrangements for environmental management.

National policies specific to the issue of DRR are outlined in the NEMP and include policies for Damage Assessment and Needs Analysis (DANA), Disaster Management Policy Framework, Donations and Importation of Relief Supplies, Emergency Shelter Management, Emergency Housing, Governmental Officers Security of Travel, Mass Fatality and Hazard Mitigation. With the exception of the Hazard Mitigation Policy, all the mentioned policies have a strong focus on disaster preparedness and response, with limited reference to the planning, mitigation and prevention components of DRR. The Hazard Mitigation Policy is anchored in the concept of sustainable development and demonstrates a commitment to a broader and more long-term development process. Emphasis is placed on developing communities, and building institutions and capabilities to reduce vulnerability.

There are also a number of other public and sectoral policies which implicitly address the concept of DRR outlined in the NEMP. Of particular note are the National Environmental Policy and Strategy (NEP/NEMs), National Water Policy, National Land Policy (NLP), and the National Climate Change Policy and Adaptation Plan (NCCPAP) which addresses the issue of hazards associated with GCC.

The country now requires the harmonization of and linkages among the current policy mix so that DRR principles are integrated and find coherence across the spectrum of governance, planning, education, livelihoods (e.g. agriculture and tourism), health and environment.

The HFA progress report (2007-2009) for Saint Lucia also notes the inconsistency in policy commitment and supporting resources for policy implementation. The report quotes that “notwithstanding the expressed commitment to DRR, ‘buy-in’ by the policy makers still appears to be a challenge, as the required level of resources (human, financial and equipment) needed for effective actualization of the DRR policies is grossly inadequate.” This may be due to what is viewed as more acute needs taking precedence over DRR concerns in the order of national priorities.

6.3 INSTITUTIONAL FRAMEWORK

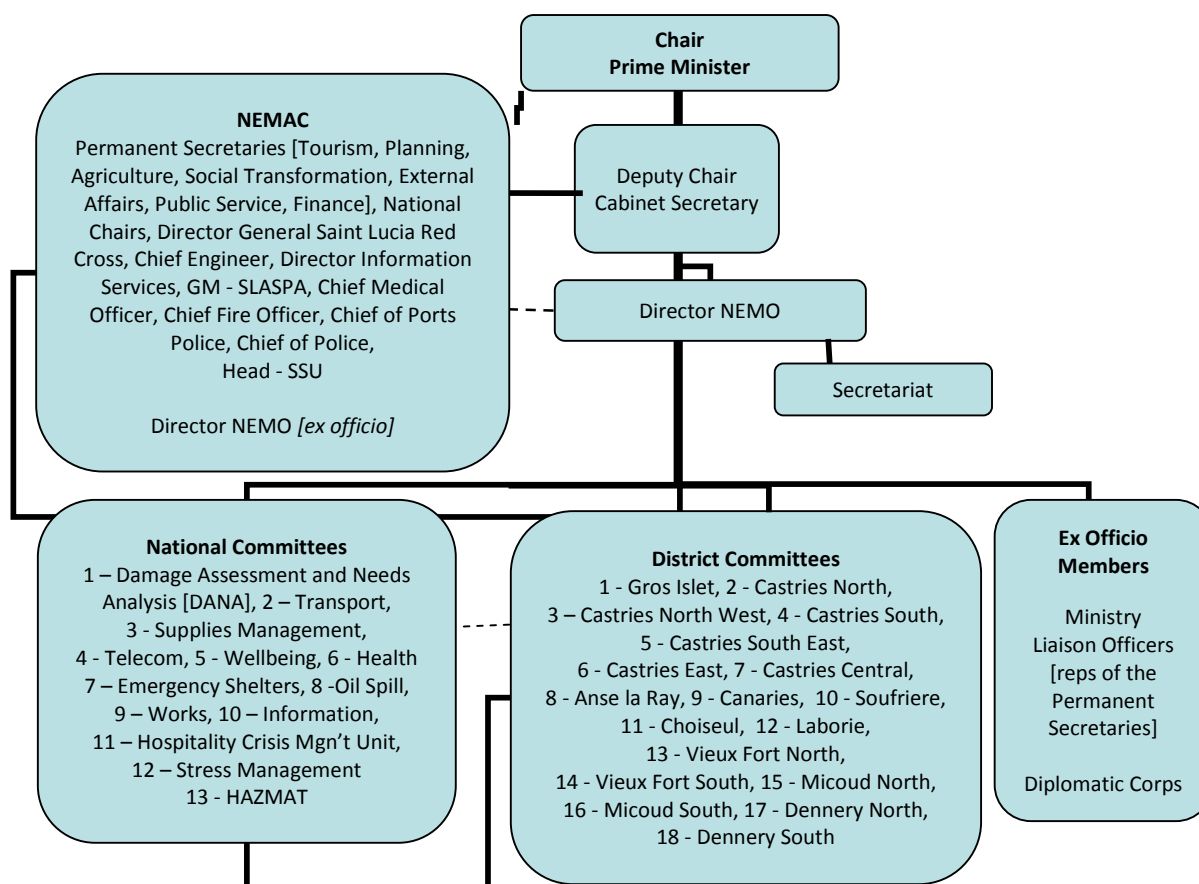
The institutional framework for national disaster management in Saint Lucia is defined under the DMA. The DMA places the responsibility for disaster management under the Office of the National Disaster

Management Organisation (NDMO), which is a separate Government Department within the Office of the Prime Minister, called the National Emergency Management Organisation (NEMO). The DMA vests the authority of Chairperson of the NDMO in the Prime Minister, who has powers to declare a national disaster under the Act, and to activate the NEMP. Important to note is that the Prime Minister currently heads the DRM portfolio in the CARICOM.

The NEMO is headed by a national disaster coordinator (NDC), Director-NEMO, which is a paid, full time position reporting to the Prime Minister. The NEMO is supported by a network of volunteers comprising thirteen (13) National Disaster Committees and eighteen (18) District Disaster Management Committees, operating under the jurisdiction of the NEMO, and involved in the planning and response against disasters. A similar structure is established at the district level with every district having a distinct Emergency Operations Centre (EOC). The NEMO organizational structure also allows for the involvement of Social Transformation Officers to act as Ex-Officio members of the District Disaster Management Committees. The local Government Councils are also integral to the functioning of the District Committees.

6.3.1 National institutional structure of DRR

The national structure for disaster management is illustrated in **Figure 6.1**.



Source: National Emergency Management Plan (NEMP)
Figure 6.1 National Structure for Disaster Management in Saint Lucia

The roles and functions of the various national actors in the DRM framework are also outlined in **Figure 6.2**.



Source: Extracted from National Emergency Management Plan (NEMP)
Figure 6.2 National Actors and Roles in Disaster Management in Saint Lucia

The NEMO Secretariat serves as the coordinating unit under the jurisdiction of the Office of the Prime Minister and is responsible for handling all the financial and operational aspects and also provides overall management and coordination for all disaster management related activities. Staffing within the NEMO Secretariat currently comprises ten full time staff, three technical and seven non-technical staff (to include three contract officers). The organizational structure and operations of the NEMO are described in the NEMP.

The physical facility of the NEMO provides dedicated office space for executive officers and clerical and support staff with space allocated for training. During an emergency, the facility transforms into the National Emergency Operations Centre (NEOC), with the functions of all essential services and key ministries and national agencies being coordinated from that location.

Of particular relevance to the DRR institutional framework is the National Hazard Mitigation Council (NHMC), established to guide technical decisions with regard to hazard mitigation in terms of assessing vulnerability and reducing risk. The Council is chaired by the Minister of Works, and comprises membership of key sector Ministries and representatives of the Chamber of Commerce, Insurance Council, SLRC and NEMO Chairperson of the Emergency Works Committee. Ex Officio members of the NHMC include the Director of NEMO, Chair of the National Climate Change Committee, Chair of the Agriculture, Environment and Natural Resources Sub Committee of the National Council for Science and Technology for Development and Chairs of all other Technical Working Groups. The objectives and operations of the NHMC are fully articulated in the NHM Policy document, but the NHMC is still to be made functional.

The existing DRR structure comprising the NEMAC, NHMC, other sectoral committees, and community level/district level disaster organisations has served to create the kind of institutional framework required for coordination and collaboration among agencies on DRR issues. However, there are still some issues to be addressed regarding critical gaps and overlaps in institutional responsibilities, insufficient collaboration among public sector agencies, a high degree of fragmentation of authority, clarity of roles among the wide range of agencies with DRR mandates and insufficient resources for DRR. Hence, issues of capacity, custody, authority and accountability of agencies with DRR mandates, and in particular as they relate to the NEMO, will have to be rationalized. In addition, arrangements to foster co-management and participatory approaches in various types of partnerships⁷⁵ will need to be clearly defined.

6.3.2 Multi-sectoral platform for DRR

The existing governance structure for disaster management is particularly noteworthy, as it integrates all levels - national, sectoral and community. Several government ministries/agencies are represented within the NEMO, including Finance and Planning, Health, Education, Welfare, Environment, Agriculture, Housing, Public Works, Tourism, Information, Defense and Security, Justice and Transportation; though these agencies do not form part of the NDMO.

Further, all disaster-related activities are advised by the NEMAC. The NEMAC is a technical working group comprising line ministries, non-governmental organisations, representatives from the private sector and is chaired by the Prime Minister. The NEMAC has an open membership and calls upon different expertise as and when needed. It convenes at regular intervals and is on demand to receive updates on the Emergency Planning process.

Although the NEMO leads the Disaster Management charge with the support of several agencies and the participation of all sectors through the NEMAC, a DRR approach on a national multi-sectoral platform is not apparent, and there is still strong emphasis on disaster preparedness and recovery. The potential for the advancement of DRR principles across a national multi-sectoral platform is however promising, considering opportunities for broadening the functions of mechanisms such as the NEMAC and the NEC, the overarching body for environmental management.

6.3.3 Local networking groups drivers and risk management

The NEMO structure promotes active networking through the National Emergency Operations Centre (NEOC) and 18 District EOCs, which exist to support the response to disasters at the national and district level. The structure also facilitates deeper networking as it allows for the involvement of Social Transformation Officers in Ex-Officio roles on the District Disaster Management Committees. The Local Government Councils are also integral to the functioning of the District Disaster Management Committees.

Urban Search and Rescue (SAR) teams also exist within the Saint Lucia Fire Service and Marine SAR Teams within the Police Marine Unit. Most Schools, Churches and some Community Public Buildings are used as Emergency Shelters. The SLRC is also a key networking partner at the local level, with regard to risk identification and management.

⁷⁵ Private-public, private-private and private-community partnerships.

There is still need however, to provide these groups operating at the local level with a strategic framework and improved management structures to better align DRR priorities and approaches to DRM at the community level and by extension at the national level.

6.3.4 Budgetary resources for the development of disaster risk reduction activities

The NDMO, the NEMO Secretariat, is financed under a separate budget head within the approved national estimates of expenditure. Activities within the programmed framework of the NEMO are financed from the NEMO Secretariat's annual work programming budget. Other support agencies, such as the Ministries with responsibility for Physical Development and for Infrastructure, also have budgetary allocations which would indirectly address many DRR concerns; however, these amounts are not disaggregated. Interestingly a National Disaster Fund has been established in Saint Lucia; however, the mechanisms to have this fund fully functional are still to be implemented.

The approved 2012-2013 budget for the NEMO was EC\$671,260.00. More than 99% of this budget pertains to expenditure to sustain the current operations of the organisation, in particular including personal emoluments and wages, travel and subsistence, utilities, operating and maintenance, communication and insurance. There is no allocation for real investments in DRR activities.

Bilateral, regional and international development partner programs provide the main source of funding for particular activities. For example, several DRR activities to date have been funded through agencies such as the World Bank, which has funded disaster mitigation activities through the projects managed by the national government. Community level activities have also been funded by donors such as Japan International Cooperation Agency (JICA), United States Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA), Food and Agriculture Organisation of the United Nations (FAO), and Global Environment Facility (GEF) small grants in the case of community projects to correct problems identified through the VCA process conducted by the SLRC. The country as signatory to the CDEMA also benefits from financial contributions from this Agency. Funds are also allocated at the regional level through the Caribbean Electric Utilities Services Corporation (CARILEC) [a Caribbean Association of Electricity Companies] to cater for post disaster reconstruction of the electricity network.

With regard to risk transfer, general insurance coverage for hurricane and seismic impacts has been secured under the Caribbean Catastrophic Risk Insurance Scheme (CCRIF)⁷⁶. A Livelihood Protection Policy⁷⁷ (parametric index based micro-insurance) has been introduced in Saint Lucia by the Eastern Caribbean Global Insurance Company, supported by the Caribbean Catastrophic Risk Insurance Facility (CCRIF).

6.4 NATIONAL DEVELOPMENT PLAN IN RELATION TO DRR

As indicated under Section 5.4.1, National Development Priorities, the national development plan as defined in the country's Medium Term Development Strategy (MTDS), though very broad-based in its response to the myriad of development issues, does not address in a substantive manner the issue of disaster vulnerability and DRR. The criticality of the need to incorporate these considerations in the development planning process has been brought to the fore by the spate of natural hazard events over the last several years, and in particular

76 Caribbean Catastrophic Risk Insurance Facility <http://www.ccrif.org/>

77 EC Global - Livelihood Protection Policy -<https://www.ecglobalinsurance.com/products-and-services/livelihood-protection-policy-lpp>

Hurricane Tomas in 2010, which have resulted in loss of lives, loss of national assets, and tremendous damage to property and livelihoods as well as the diversion of funds which could support ongoing development initiatives to relief and recovery efforts.

6.4.1 DRR and DRM national plan

A national disaster management framework for the country was established as far back as the early 1980s guided by a National Disaster Plan, which later evolved into the NEMP.

The overall national Development Plan on the other hand, is defined in the country's Medium Term Development Strategy (MTDS). As previously indicated the current MTDS, does not address in a substantive manner the issue of disaster vulnerability and DRR. However, the National Emergency Management Plan (NEMP) purposes to outline preparedness, prevention, mitigation and response activities within the national framework, and the organizational and functional mechanisms and procedures required for carrying out the national disaster management programme.

While the NEMP has not developed fully the areas of disaster prevention and mitigation it outlines clearly the commitment of the Government to disaster preparedness, prevention, mitigation and effective response, to encompass the full spectrum of DRR. The Plan also highlights the responsibility of the NEMO for the coordination of risk reduction programmes and evaluation of effectiveness of risk reduction activities.

The country's CDM Strategy and Programming Framework for the period, 2012 – 2017 has gone further, and addresses the key elements of the DRR conceptual framework described in the UNISDR definition, namely, (i) risk awareness and assessment, (ii) knowledge development, (iii) public commitment and institutional frameworks and (iv) early warning systems.

The overall focus of the national CDM strategy is the building of resilience at national and community level to respond to and cope with hazard impacts. In this regard, concrete resources would be sought to expand and replicate several on-going best practices throughout the region. The thematic areas selected for priority attention reflect a strong DRR approach including: hazard mapping and vulnerability assessment; flood management; community disaster planning; early warning systems; climate change adaptation; and knowledge enhancement.

Further, the national Natural Hazard Mitigation Plan (2006) recognizes the inextricable linkages between DRR and CCA, particularly with regard to similarities in hazard mitigation measures and CCA measures; for example measures required to address storm surge and possible impacts of sea level rise, respectively.

While the implementation mechanism for the NHMP is yet to be fully elaborated, it is envisaged that the existing framework for disaster management, with its demonstrated successes, can be built on and extended to fully integrate environmental management and CCA, as mechanisms for integrating DRR principles into the country's sustainable development framework.

6.5 REFLECTIONS ON THE LEGAL, REGULATORY, INSTITUTIONAL AND MANAGEMENT CAPACITY

The policy, legal, regulatory and institutional framework governing DRR is quite varied and mixed, reflecting a highly evolved governance framework, though with a strong orientation to disaster preparedness, response and recovery, and lesser emphasis on disaster planning, prevention and mitigation. Seemingly, the existing

legal instruments have found limited national-level application and enforcement, especially in the face of inadequate monitoring for compliance. This is probably due to the absence of more specific and targeted regulations required for supporting, and giving form to the existing legislation, as well as the insufficiency of resources for monitoring and regulating compliance⁷⁸. In addition, despite the reasonably well-developed institutional framework for DRR, the structure and capacity for managing risk is still underdeveloped, with regards to authority or capacity to influence decisions related to national development planning and investment in DRR. Further, policy and law in the island tends not to address the underlying causes of environmental issues, such as population increase. In addition, government and nongovernmental organisations charged with protecting the environment are hampered by a lack of capacity, especially for monitoring and regulating.

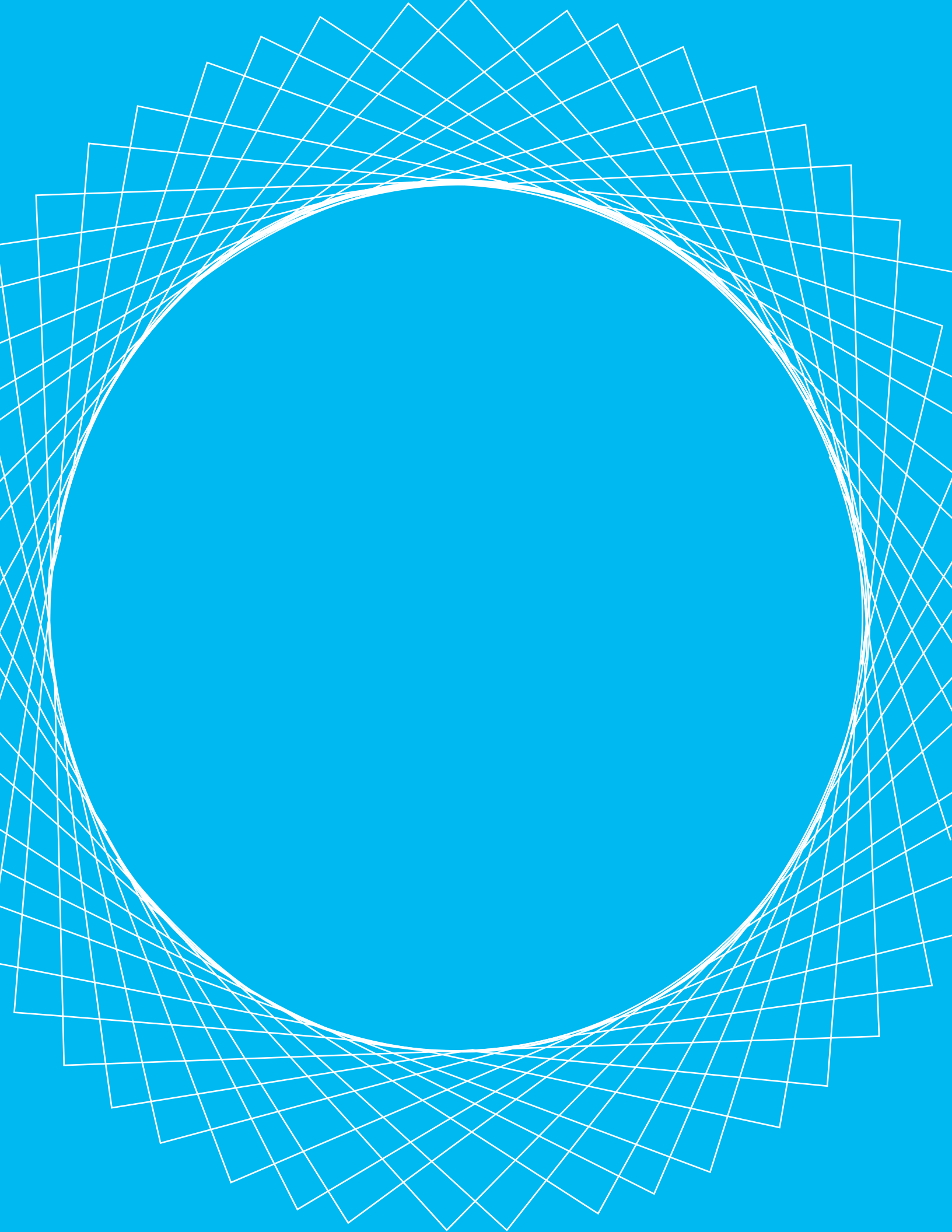
A legal, regulatory, and institutional framework, infused with a culture of accountability, will be required for effective governance and service delivery with regard to DRR. A key accountability measure in this regard, is the extent to which a government is able to address the risk of poorly planned and managed urbanization, environmental degradation, and poverty. Access to information, particularly information on disaster risks, will also generate a social demand for DRR. Adequate national legislation will also be needed to promote the introduction of, and monitor compliance with, monitoring and accountability mechanisms. This will serve to improve policy coherence, enhance the efficiency and effectiveness of allocation of resources, minimize duplication and contradictory policies, deal with tradeoffs, and reduce the sensitivity of development activities to current and future climate related and other disasters.⁷⁹

The need for proper parliamentary oversight and national auditing systems cannot be underscored. The scale and range of internal and international accountability mechanisms has not been fully explored, nor the potential for such mechanisms to be applied to the field of DRR. Accountability measures can guide government and foster support for DRR. Such measures can also promote public awareness, facilitating empowerment and mobilization of civil society to act in support of DRR.

There is also growing recognition among stakeholders about the need for government to pursue effective DRR policy, planning and implementation that is transparent and fully participatory. This of course will require fully developed, coordinated and coherent action on DRR across different sectors, public and private sector, and between central and local governments. Such a holistic approach will ensure optimum use of human, technical and financial resources to expand avenues for implementation of DRR initiatives. The NEC, in its function as a mechanism for national coordination and collaboration among public and private agencies for the management of environmental issues, presents a possible platform for broadening this pillar of sustainable development to include DRR issues, through the integration of the existing NEMAC coordinating mechanism and as well as those at the community level. Most important would be the establishment of information systems and management structures to facilitate effective organization, coordination, collaboration, and the development of human and financial capacity at all levels (national, sectoral, and community) to effectively mainstream DRR and resilience building.

78 Provisions for Hazard Inspectors under Part IX, Miscellaneous Section of the DMA, have not been effected due to a lack of resources.

79 Urwin, K and A. Jordan, "Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance", 18(1) *Global Environmental Change-Human and Policy Dimensions* (2008), 180.



7. State of disaster risk in Saint Lucia

7.1 CONDITIONS OF RISK IN COUNTRY

There are various approaches and concepts on disaster risks; however, for the purposes of this exercise the definition for reference on disaster risks developed by the UNISDR will be used: “The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.”

The national documentation on DRR is replete with documents emanating from reviews and assessments that have identified to some extent, conditions of risk for Saint Lucia. This documentation includes the National Hazard Mitigation Policy, Risk Management/ Vulnerability Benchmarking Tool (B-Tool) Report for Saint Lucia⁸⁰, and CDEMA Disaster Management Audit Country Report for Saint Lucia (2010).

These assessments all corroborate that Saint Lucia, like many other Caribbean SIDS, due to its geographic location; relatively small size; open economy with a negative balance of trade; limited natural resource base; limited human capacity and resources; and limited technological capability, is highly susceptible to the vagaries of international trade and exogenous economic and financial shocks. Safety and security issues are now high on the global and regional agendas and needs to be elevated on the national agenda. Terrorism, bio-security, food security, environmental health, and security implications of “open borders” are but some of the concerns. In this regard, the enhanced CDM strategy emphasizes the need for “growing attention” to technological or human induced hazards, and the need for a stronger multi-hazard approach and a broadening of concern beyond natural events, particularly hurricanes.

7.2 HISTORICAL DISASTER ANALYSIS

While there is no historical record regarding the establishment of an office to deal with disasters, anecdotal evidence suggests that a desk was initially set up to deal with disasters sometime in the early 1980s, and by 1990 there was an established Office of Disaster Preparedness, under the supervision of a National Disaster Coordinator. A formal historical compilation on disasters generated from the information from this office has been made in the Saint Lucia Disaster Catalogue, which was first produced in 1999⁸¹. The catalogue continues to be updated as events occur.

The DesInventar database was developed in 1994 by the Network for Social Studies in Disaster Prevention in Latin America <http://www.desinventar.org> to provide a mechanism for the formal historical recording and analysis of disaster events. Until recently the database was accessed by the national focal point but not utilized in practice in the country. Following on PDNA training conducted by CDEMA and UNDP in July, 2014, a DesInventar Committee has been constituted to re-institute a system for data collection, analysis and management, integrating improved technologies such as software for GIS mapping.

80 USAID/OECS, 2007. Risk Management/ Vulnerability Benchmarking Tool (B-Tool), National Assessment: Saint Lucia.

81 A. L. Dawn French, 1999 - Disaster Catalogue for Saint Lucia.

The national catalogue categorizes events based on time period and type of event, and includes data and information regarding date of the event, brief description of the event, number of persons killed, number left homeless, costs and comments. However, data for some of the parameters, in particular costs, is incomplete. A summary of type of disaster events and frequency of occurrence during the three time periods is presented in **Table 7.1**.

Table 7.1: Summary of Disaster Events and Frequency of Occurrence in Saint Lucia 1700 -2000s

Type of Event	1700-1800s		1900s		2000s	
	No. of Events	Loss of Lives	No. of Events	Loss of Lives	No. of Events	Loss of Lives
Earthquake	1	1	4	N/A	2	0
Fire	N/A	N/A	5	3	2	3
Landslide	N/A	N/A	5	100	N/A	N/A
Medical	2	1509	N/A	N/A	3	1
Oil Spill	NA	N/A	2	0	3	0
Hurricane/Storm/Flood	4	823	15	35	6	8
Other	1	8	9	70	5	2

N/A – Not available; other includes mass casualty events such as civil unrest, airplane crash, boat tragedy, building and infrastructure collapse.

The listing of the history making events during the 1700–1800 range from hurricanes, earthquakes, health epidemic and civil unrest; and in the 1900s: range from hurricanes, storms, fires, earthquakes, landslides, mass casualty (air, sea and terrestrial), pestilence and civil unrest. Further, analysis of the data from the Catalogue reveals a decreasing trend in the occurrence of certain types of disasters such as fires, while there has been an increasing trend in the occurrence of disasters such as hurricanes/storms/floods. However, the data show a decreasing trend in loss of lives for these events. Changes in the type of medical emergencies are also noted, from deadly epidemics such as yellow fever and cholera to less impacting dengue and influenza.

Data from other sources corroborate that historically, hurricanes, storms and flooding have been the most likely hazards to affect Saint Lucia. Tropical Storm Debbie in 1994, resulted in losses of over EC\$230 million. The Tropical Wave of October 1996 also incurred an estimated EC\$12 million in damages to property and infrastructure particularly in Soufrière, Anse la Raye, Vieux Fort and Castries. Damage associated with Tropical Storm Lili 2002 was estimated at EC\$20 million. Flooding has been of major concern particularly in low-lying areas as well as coastal villages and has resulted in the displacement of people and the destruction of property in communities. Droughts have also affected the quantity and quality of available water supplies to local communities, and also productive sectors of the economy. About eight (8) major land slippages (including the 1938 Ravine Poisson Landslide) have also resulted in significant loss of lives and the destruction of homes, dislocation of approximately 145 families, loss of biodiversity particularly from landslides at La Sorcière, and costs totaling over US\$0.74 Million (EC \$2million)⁸². Recent assessments⁸³ also bear out the issue of the increasing cost of disaster events, related to loss of lives and property, human injury, destroyed tourism and

82 Draft Hazard Mitigation Plan, Saint Lucia, 2003.

83 Damage Assessment and Needs Analysis (DANA) Policy (2007)

general infrastructure, loss of crops and livestock and household, commercial and industrial assets, such as the colossal losses of over US\$500 Million (EC\$1,358 Million) from Hurricane Tomas in October 2010.⁸⁴

Since the last major eruption of the Soufrière volcano over 200 years ago, volcanic activity has been latent. However, seismic activity has been ongoing, with the island experiencing at least five swarms of shallow earthquakes over the last hundred years, occurring in 1906, 1986, 1990, 1999, and 2000 (Seismic Research Unit, 2002⁸⁵). Though many of the tremors have been insignificant; some strong shocks have been recorded, with one of magnitude 7.4 as recent as November, 2007. The history of Saint Lucia is also replete with development marred by fires, most notable being the 1948 Castries Fire. The 1854 Cholera Epidemic also demonstrates the occurrence of health related disasters.⁸⁶

7.3 HAZARDS⁸⁷/THREATS

Hazard analysis and experience have confirmed that Saint Lucia by virtue of its geographic location, physical formation and fragile ecosystems is at risk from a number of natural, technological and human-induced hazards. Additionally, the island is at risk to “slow on-set” hazards that include droughts, plagues, and the effects of GCC. These hazards have the potential to cause loss of lives, severe damage to infrastructure and other economic assets, as well as cause adverse effects on livelihoods. Some of the natural hazards include hurricanes, flooding, landslides, seismic and volcanic activity. Tropical storms and hurricanes are also frequently accompanied by storm surges, floods and landslides, which give rise to soil, beach and/or coastal erosion. Technological and human-induced hazards include explosions, oil and hazardous material spills, mass casualty, civil unrest, fires and information and communication technology disruptions.

The categorization of hazards found in the Saint Lucia National Risk Register⁸⁸, has been used to describe the range of hazards to which the country is exposed. A synopsis of these hazards is presented in the following sub-sections.

7.3.1 Naturally occurring

7.3.1.1 Tipo geodinámico Geodynamic/geo hazard

The National Risk Register identifies 3 sub-categories of this hazard/threat for the island: earthquake; volcanic eruption and tsunami.

- **Earthquake** sub-categories include ground vibration, liquefaction and ground rupture (unlikely for Saint Lucia). Other threats under this sub-category include secondary effects common to a number of other hazards such as fires, landslides etc., which may result due to the ground vibration effects.
- **Volcanic activity** includes emissions and seismic related geophysical processes, such as mass

84 Economic Commission for Latin America and the Caribbean (ECLAC). 2011. Saint Lucia, Macro socio-economic and environmental assessment of the damage and losses caused by Hurricane Tomas: a Geo-environmental disaster, Towards resilience. Prepared by UNECLAC Sub-regional Headquarters for the Caribbean.

85 Cited from A. L. Dawn French, 1999. Disaster Catalogue for Saint Lucia.

86 ibid

87 “Natural hazard: natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage”. UNISDR Terminology, 2009.

88 GOSL. 2006. Saint Lucia National Risk Register: Modelled on the Sussex Local Resilience Forum: Community Risk Register of 14th November 2005.

movements, landslides, rockslides, surface collapses, debris or mud slides, pyroclastic flows, surges, ashfall, mudflows for the volcanic threat. Secondary effects such as landslides, pyroclastic flows and surges would actually cause damage through various mechanisms such as their physical impact, heat (so therefore, fires) etc. The integrated volcanic hazard zone map developed by the Seismic Research Centre at UWI (Figure 7.1), demonstrates the condition of risk for volcanic hazard in Saint Lucia.

- **Tsunami** is a series of ocean waves generated by sudden displacements in the sea floor, landslides, or volcanic activity. In the deep ocean, the tsunami wave may only be a few inches high. The tsunami wave may come gently ashore or may increase in height to become a fast moving wall of turbulent water several meters high.⁸⁹ Tsunamis in the Caribbean region fall into two categories: 1) tele-tsunamis triggered by earthquakes along faults off the coast of Portugal, and 2) tsunamis generated by earthquakes along the faults of the Caribbean Plate boundaries.

7.3.1.2 Hydro-meteorological Hazards

Phenomena included under this type of hazard include tropical cyclones (hurricanes and tropical storms associated with high winds), thunderstorms, coastal storm surges, heavy rainfall resulting in floods including flash floods, drought, heat waves and cold spells as well as effects of El Niño Southern Oscillation (ENSO). In the Caribbean, rainfall is influenced by the ENSO and fluctuations in other large scale climate systems. An El Niño episode generally brings with it warmer and drier conditions, while La Niña brings colder wetter conditions, hence the reason for significant inter-annual variability and anomalies. Five sub-categories under a classification of severe weather were created within the National Risk Register for these types of phenomena, namely, hurricane/high winds, coastal flooding and storm surge, flooding of rivers and streams, localised/flash flooding and extreme high temperatures.

Landslide hazard is mapped in **Figure 7.2**. This shows that most of the island is subject to at least moderate landslide hazard, with only a strip of land from Choiseul to Vieux Fort and small pockets of flat land around the remainder of the island subject to low landslide hazard. Much of the island's road infrastructure traverses areas of high or extreme landslide hazard risk. Further, communities with limited road access are particularly vulnerable to isolation following landslide events.

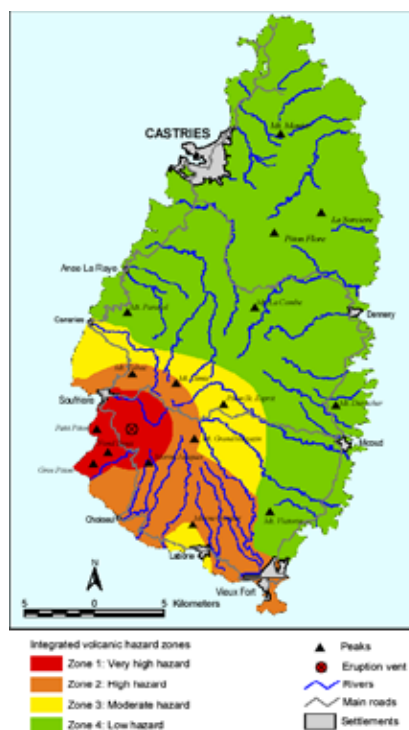


Figure 7.1 Integrated Volcanic Hazard Zone Map
Source: Seismic Research Centre

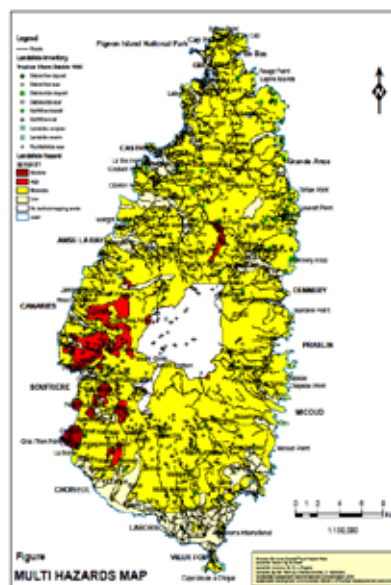


Figure 7.2 Landslide Hazard Map
Source: National Hazard Mitigation Plan

89 National Oceanic and Atmospheric Administration (NOAA)

7.3.2 Anthropogenic/human-induced Hazards

7.3.2.1 Socio-natural hazards

These types of hazards are generally associated with rapid urbanisation of former rural areas of the island that have led to denser populations living in unplanned or informal settlements, (with inadequate basic-service provision such as supply disruptions with fuel, water, electricity, communications and retail supplies; health with regard to inadequate emergency response cover; and education) where the effects of human activities can result in increased risk with regard to natural and human induced disasters.

The National Risk Register covers these types of hazards under the categories of civil unrest (and related consequences such as internal displacement and migrations); industrial action (withdrawal of labour) and staff shortage; public safety and security, with regard to mass crowd gatherings; supply disruption; structural emergency; and transport. Each category is further broken down into sub-categories that manifest the hazard at the micro or site specific level. For example sub-categories under transport include: airport crash, sinking of vessels, collision of vessels at sea, and major vehicular accidents on road network, incidents on road tunnel, crash transporting hazardous material, and crash transporting radioactive materials. Most of the human-induced hazards are likely to result in disaster in the form of mass casualty.

Deforestation is also another aspect of this type of hazard that can lead to land degradation and disruption of ecosystems which can be further exacerbated by climate change related disaster impacts.

7.3.2.2 Technological hazards

These types of hazards are considered in the context of both intentional and unplanned. These stem from BLEVE (boiling liquid expanding vapor explosion) and CBRNE (chemical, biological, radiation, nuclear and environmental/explosive), pollution from fires, explosions, toxic spills, bioterrorism, mining and geothermal explorations in highly sensitive environmental areas, among others. Pollution from unexploded arms and ammunitions and obsolete chemicals/persistent organic pollutants (POPs) are also considered under this hazard.

The National Risk Register identifies three main related categories in this regard and sub-categories of each. The three categories are 1) environmental pollution/infestation, 2) fire/explosion, and 3) terrorism. Emerging threats/hazards related to data and information security require consideration.

7.3.3 Health Emergencemergency hazards

These types of hazards are associated with illnesses and epidemics of major occurrence in humans, but also in animals and plants (phyto-sanitary). Examples (in humans) include, pandemics such as avian flu; epidemics including traditional and haemorrhagic dengue fever, malaria, yellow fever, cholera; food borne illness or communicable diseases; and mass fatalities such as poisoning. The National Risk Register identifies animal health diseases, both zoonotic and non-zoonotic, manifested in food product contamination. Emerging threats/hazards from biological agents including genetically modified organisms (GMOs), living modified organisms (LMOs) and synthetically modified organisms (SMOs) now require urgent consideration.

7.3.4 Links to climate change

Current and future climate predictions for Saint Lucia indicate increased frequencies of extreme/severe weather events. These events are anticipated to have negative impacts and also to exacerbate the impacts of

other hazards. Hydro-meteorological factors are considered important contributors to some of the processes that give rise to geological and environmental threats/hazards. Hence, with the advent of climate change, an increase in the intensity of hydro-meteorological events is likely to bring about an increased incidence of these hazards.

Similarly, climate related health impacts, including vector and waterborne diseases are expected to become more prevalent with climate change.

All of the anticipated impacts are likely to trigger some form of disaster that have cross cutting, multi-sectoral impacts, causing major social, economic and environmental stresses. Alleviation of these adverse impacts can be pursued through appropriate and timely coordination between climate change and DRR efforts. Important to note however, is the nuance in the objectives of the UN Convention on Climate Change (UNFCCC) and the Hyogo Framework in this regard. Under the UN Convention on Climate Change, developed countries have an obligation to provide financial and other support to developing countries to address the impacts of climate change. Under the Hyogo Framework, there is a focus on building resilience to disasters through domestic efforts.

Thus, it is imperative that the country remains cognizant of the potential results of current moves by developed countries to push the response to climate change-associated events under the DRR framework. While this will allow the developed parties to relieve themselves of their obligations, the consequence will be the loss to developing countries of the benefit of new and additional funding for addressing the impacts of climate change.

Further, disasters, in the DRR context, are often seen as events occurring in the short term due to natural factors while climate change is seen in climate circles as a phenomenon that is causing changes, including more intense extreme events, into the long term.

7.4 VULNERABILITY

The plethora of documentation on disaster management widely endorse that Saint Lucia, like most Caribbean SIDS, is highly prone to devastating natural and anthropogenic/human-induced disasters. Its vulnerability can be attributed to *“antecedent conditions determined by physical, social, economic, environmental and political factors and processes that increase the susceptibility and exposure of a community to hazards”*.⁹⁰

7.4.1 Criteria and Methodology for Risk Analysis

Except for the case of the vulnerability and adaptation (V&A) assessments for the Second National Communication (2010) on Climate Change for Saint Lucia, criteria and methodologies for analysis of vulnerability have been very general and at a national scale, and hence not clearly defined for specific hazards and risks.

The main methodology for analysis of vulnerability with regard to disaster risks has been the Vulnerability Assessment Benchmarking Tool (B-Tool) developed by the OECS Secretariat. The B-Tool is a quantitative assessment tool which evaluates capacities in the six (6) phases of risk management, namely (i) risk

90 Adapted from Study Report “Facing Hazards and Disasters: Understanding Human Dimensions. National Academies Press”. <http://www.nap.edu>

identification, (ii) risk mitigation, (iii) risk transfer, (iv) disaster preparedness, (v) emergency response and (vi) rehabilitation and construction. The B-Tool provides an index as an indicator of the relative strength and weakness of DRR initiatives in country.

Community level Vulnerability and Capacity Assessments (VCAs) have also been coordinated by the SLRC and involve the application of criteria and methodology outlined in a pre-designed Community Disaster Response Team (CDRT) field guide, which are based largely on the criteria and methodology used for Damage Assessment and Needs Analysis (DANA).

Both the CDEMA Disaster Management Audit and the HFA Monitor utilize a more qualitative assessment methodology. However, key indicators are proposed by the HFA in the HFA Monitoring tool that enable the assessment of progress made in DRR in the country.⁹¹

The methodology provided by the Climate Studies Group Mona⁹² for the vulnerability and adaptation (V&A) assessments for the Second National Communication (2010) on Climate Change for Saint Lucia, qualitatively analyses vulnerability of each sector, using primarily an outcome approach⁹³, while seeking to integrate the vulnerability approach⁹⁴. The V&A assessments were conducted on a sectoral basis, hence criteria for impact assessment were sector-specific and were aligned to key thematic areas in the sector. The application of a scenario approach also provided a useful tool for assessing the extent of the country's vulnerability from large to small degrees of changes in climate. This approach is particularly important for an island such as Saint Lucia, whose economy, and by extension, its socio-political structures, is largely natural resource-dependent, and therefore, likely to be directly affected by changes in climate parameters. This approach is also quite applicable to other types of disaster related events.

It is therefore imperative that Saint Lucia continues the process of V&A assessments particularly with regard to DRR in ongoing and projected development programmes, plans and projects, using appropriately structured and systematic assessment methods. This is necessary if appropriate DRR and CCA options are to be developed and the impacts minimized with regard to changes in the external environment.

7.4.2 Underlying Drivers of Risk

The variety of risks prevailing at both the macro level and micro-level all contribute to the varying facets of the vulnerability of the island, driven by the following risk factors outlined below:

Physical: The small geographical area of the island accounts for the fact that disasters take country wide proportions. Further, it is located in an area with some of the highest risk conditions on the planet, such as mid ocean ridges with strong volcanic and seismic activity, tropical cyclone belts, and direct exposure to the forces of the oceans, and these account for high vulnerability to a wide range of natural hazards.

Social: The changing social landscape with regard to population growth and demographic changes have given rise to increased conflict for available resources and increased vulnerability to human-induced disasters. Poverty and unemployment further exacerbate vulnerability to the impacts of hazards resulting, often times,

91 <http://www.preventionweb.net/english/hyogo/hfa-monitoring/national/?pid:73&pih:2>

92 Climate Studies Group Mona, Department of Physics, University of the West Indies, Mona Campus

93 An outcome approach to analysing vulnerability is best suited to the well-defined, closed-system impacts/issues, identified for each sector.

94 This type of vulnerability assessments is centred around technologically focused adaption and mitigation strategies.

in the escalation of situations of disaster. In most cases, the poor are most vulnerable. Cultural norms and mores were once an integral part of disaster risk mitigation. However, there has been a decline in the use and application of traditional practices and as a result, a loss of traditional knowledge and inadequate human capacity to implement DRR.

Economic: The fact that the island is dependent on few sources of income in the key productive sectors, in particular tourism and agriculture for a substantial part of its gross domestic product (GDP), increases its vulnerability as these sources of income can be severely reduced for months by a single catastrophic event. Another critical factor which highlights Saint Lucia's vulnerability is its lack of financial capacity to reactivate the development process following major disaster events. The challenges posed by global externalities such as trade liberalization, commodity price fluctuations, rising cost of food and fuel, and the effects of the global financial crisis, further increase economic vulnerability.

Environmental: The Island is characterized by fragile ecosystems and most development imperatives often lead to conflict over environmental conservation and protection. This is further compounded by an apparent lack of appreciation of the cost of the loss to society as a whole with regard to damage to the environment and natural resources, and thus areas important for ecological services, such as wetlands, forest reserves and other protected areas, are often undervalued. Resulting environmental degradation is further exacerbated by the debilitating impacts of climate change.

Political: Lack of demonstrated political leadership in seeking to integrate DRR into the development agenda by creating the appropriate governance structures and financing mechanisms often precludes any possibility of developing and implementing meaningful disaster mitigation and CCA programmes.

7.4.3 Analysis of vulnerability: fragility, exposure, resilience

The World Conference on DRR in 2005, recognized that “risk is not only associated with the occurrence of intense physical phenomenon but also with the vulnerability conditions that favor or facilitate disaster when such phenomenon occur. Vulnerability is intimately related to social processes in disaster prone areas and is usually related to the fragility, susceptibility or lack of resilience of the population when faced with different hazards”⁹⁵

In Saint Lucia, a high percentage of the population lives along the coastal area. Most of these settlements have very little room for expansion except through hillside residential development – areas that are highly susceptible to the ravages of extreme events such as hurricanes.

In Saint Lucia, poor land use planning and associated squatter developments, deforestation and developments in disaster prone areas have exacerbated vulnerabilities, while the absence of approved building codes and standards has resulted in a housing stock prone to damage by floods, landslides and high winds. Notably, key economic activities, and associated infrastructure such as airports, sea ports, fuel storage and hotels, as well as critical infrastructure such as hospitals, schools and security services tend to be concentrated along the coast and these have been deemed highly vulnerable to the impacts of extreme climate related events such as increased rainfall variability, land degradation and storm events. The island also suffers from a water deficit in some areas and proposed national development plans which involve large tourism developments, among others will exacerbate vulnerability with regard to water security. Tourism activity and poorly planned

⁹⁵ Summary report for session “Visions of Risk and Vulnerability: Patterns, Trends, and Indicators”, World Conference on Disaster Risk Reduction, held in Kobe, Hyogo, Japan, January 18-22, 2005.

housing developments also threaten important marine and terrestrial ecosystems, thus eroding the resilience of natural systems to the impacts of the various natural and human-induced hazards, and are thus likely to add to the economic vulnerability of the island as a whole.

The extent of Saint Lucia's vulnerability to disasters and the impacts of climate change and climate variability are influenced by several drivers which are largely socio-economic and ecological in nature. The development of governance structures for managing risk across the three pillars of sustainable development, that is, economic, social and environment, is an imperative, though a major challenge for the Government.

7.4.3.1 Vulnerable Sectors

The V&A assessments conducted during the Second National Communications (SNC) highlighted the vulnerabilities to climate hazards across the critical sectors of water resources, land resources, agriculture, tourism, coastal sector, marine resources, forest terrestrial resources, health, financial services, and critical infrastructure.

Climate Change Adaptation (CCA) strategies and measures have also been proposed for these critical sectors of the economy in the Saint Lucia SNC V&A exercise, with major costs associated with upgrading of critical infrastructure and public sector assets such as health care centres, hospitals and government offices, among others. For a small island with a relatively small population, the financial needs for CCA alone are quite substantial. It stands to reason that creating a strategic framework for DRR that integrates CCA will allow for better leveraging and mobilizing of the necessary financing and more effective investment in risk management.

7.4.3.2 Vulnerable areas/regions

While the initial Disaster Preparedness and Response Act # 13 of 2000 gave particular focus to addressing specifically the issue of *Specially Vulnerable Areas*, similar provisions have not been included in the revised DMA No. 30 of 2006. Hence the need for the Ministry with responsibility for physical planning and development to work together with the NEMO and the National Hazard Mitigation Council (NHMC) to determine where these vulnerable areas exist in Saint Lucia and delimit them, given due consideration to the different types of hazards. Special Enforcement Areas have also been declared under the Physical Planning and Development Act. Vulnerability mapping data for two hazards, flood and drought (precipitation change) are available in the Sector Reports for the SNC⁹⁶, and illustrate potentially vulnerable zones/areas in Saint Lucia. Knowledge of these areas will allow for better development planning that considers risk and vulnerability in order to implement adequate mitigation measures.

Drought vulnerable regions are indicated over more than 20% of the island, in the north, south east and southern parts of the island and in areas of land use ranging from forest to agriculture to residential/commercial (**Figure 7.3**).

Three flood hazard zones (high, medium and low) were identified⁹⁷ on a medium-scaled map delineating important settlements, road networks and the catchments contributing runoff to the hazard zones. Most

96 GOSL, 2010. Lucia's Second National Communication on Climate Change: Vulnerability and Adaptation Assessment, Agriculture.

97 Caribbean Development Bank. 2006. Flood Hazard Mapping of Saint Lucia. Final Report, By Vincent Cooper, Flood Hazard Mapping Consultant and Jacob Opadeyi, GIS Consultant.

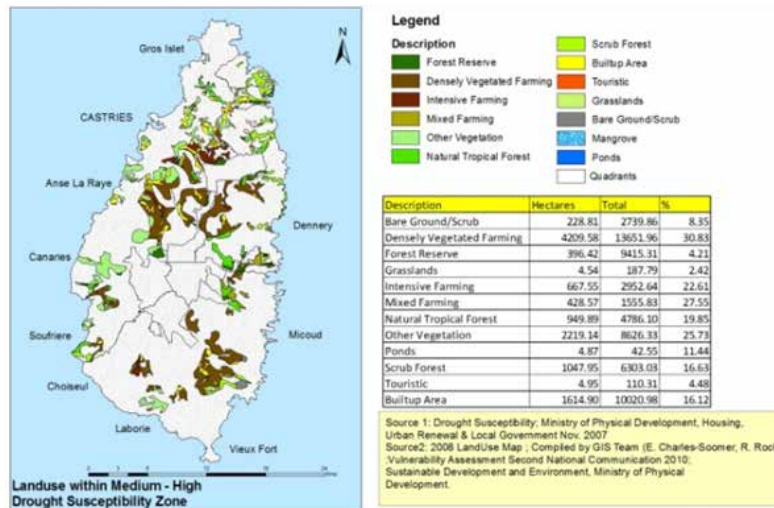


Figure 7.3 Drought Vulnerability Zones for Saint Lucia

of the island was categorized at low risk to flood hazard. Areas deemed as high risk to flood hazard include the coastal plain north of Hewanorra Airport (flat lands on eastern and north eastern sides) and areas on the western side of the island (Roseau river flood plain). Some of the detailed map assessment also showed that within the city of Castries, the north-central and eastern streets are most prone to flooding.

The island-wide flood hazard maps identify likely regions to be flooded for extreme rainfall and give a mean depth of flood waters within regions. They do not provide detailed information of flood water levels, velocities or locations of specific hazardous places. Further, they cannot incorporate detailed hydraulic properties of drainage facilities in the region. Notwithstanding these limitations, these maps can still be quite useful.

7.4.3.3 Vulnerable groups

Vulnerable populations are defined by one expert group as follows: "People who cannot comfortably or safely access and use the standard resources offered in disaster preparedness, relief and recovery. They may include people with sensory impairments (blind, deaf, hard-of-hearing); cognitive disorders; mobility limitations; limited English comprehension or non-English speaking; as well as people who are geographically or culturally isolated, medically or chemically dependent, or homeless." Source: CDCP

Though some work has also been done on mapping the spatial dimensions of some hazards (flooding, drought, landslides) and the 2005/2006 Survey of Living Conditions points to locations of various vulnerable groups (female headed households, children under the age of 14 years and the elderly), there is still a need to map the social dimensions of these vulnerable populations/groups to help

reinforce better decision making and more targeted programming. Research done by the Centre for Disease Control and Prevention (CDCP)⁹⁸ further illustrates the importance of disaggregated vulnerability and capacity assessments by gender and other vulnerable groups. For example, the research showed that older adults may have impaired mobility, diminished sensory awareness, multiple chronic health conditions, and social and economic limitations—all of which can impair their ability to prepare for, respond to, and adapt during emergencies.

98 Centre for Disease Control and Prevention. Identifying Vulnerable Older Adults and Legal Options for Increasing Their Protection During All-Hazards Emergencies: A Cross-Sector Guide for States and Communities. Atlanta: U.S. Department of Health and Human Services; 2012.

There has been ongoing progress with regard to the generation of information on hazards and vulnerability. Some limited national and local assessments based on hazard data and vulnerability information are available, and include risk assessments for key sectors. However, there are still no systems in place to monitor, archive and disseminate data on key hazards and vulnerabilities. Further, the absence of a comprehensive national multi-hazard database or archive with protocols for information sharing impedes the use of mechanisms to inform the local and regional DRR efforts. Mechanisms for the systematic research, recording and analysis of the hazards which have impacted Saint Lucia and the impacts of these hazards also need to be established.

There is also need to generate gender disaggregated disaster impact data at the community level, so that special care is taken to meet the needs of both women and men in a disaster event (e.g. gender sensitive shelter management policy). Risk mapping of vulnerable groups will also help to profile each of these groups within the context of the vulnerable situations in which they live and to identify their coping and adaptive capacities. The mapping will also help to identify hotspots of high vulnerability in Saint Lucia.

7.5 CAPACITY BUILDING

In 2004, the Pan American Health Organization (PAHO) cited well developed capabilities for disaster management in Saint Lucia, with very active participation from all stakeholders, as cited in Box below.

National Disaster Management is very active and well developed. St. Lucia has achieved Disaster Management capabilities which other Caribbean countries can follow. Numerous agreements with the private sector, NGO's, Service Organizations, and neighbouring French Departments have been implemented. Health sector mitigation activities have begun and are expected to continue. St. Lucia has all possible disaster plans available and updated thanks to the National Emergency Management Organization St. Lucia. [SOURCE: <http://www.disaster-info.net/carib/stlucia.htm>]

The level of progress reached in developing institutional and community capacity for DRR has been assessed using various assessment tools, and reported on in the B-Tool Country Assessment Report for Saint Lucia (2006), CDM Audit (2010) Country Report for Saint Lucia and HFA Progress Reports. A summary of the results of the B-Tool Assessment (2006) in terms of the relative adequacy of capacity within the six (6) phases of risk management is presented in Table 7.2 below.

Table 7.2 Summary Results of Saint Lucia B-Tool National Assessment

Phases of Risk Management	Total Number of Questions (TNQ)	Maximum Attainable Score (MAS)	Total Score	Percentage Score (RMI)
Risk Identification	106	318	157	49%
Risk Mitigation	42	186	93	50%
Risk Transfer	48	144	36	25%
Disaster Preparedness	120	360	247	69%
Emergency Response	57	171	95	56%
Rehabilitation and Reconstruction	56	168	63	36%
Total	449	1347	691	51%

Source: Risk Management Benchmarking Tool (B-Tool), National Assessment for Saint Lucia, 2006

The risk management index (RMI)⁹⁹, calculated as a percentage score from the quantitative assessment methodology used for the evaluation of capacities in the six (6) phases of risk management, serves as an indicator of the relative strength or weakness of DRR initiatives in each of the phases. At the time of assessment, the indices computed indicate reasonably well developed capacity for disaster preparedness and emergency response, a lesser degree of capacity development in areas of risk mitigation and risk identification, and limited capacity development for risk transfer, and rehabilitation and reconstruction.

The national CDM Strategy (2009) emphasizes capacity building in areas that address governments, particular ministries, National Disaster Organizations, National Disaster Management Offices, and other key local, national and regional institutions, and include a variety of skills sets such as governance, knowledge management and sharing, awareness and promotion, and the links to economic and sustainable development.

The CDM 2010 Audit Report for the country provides a qualitative account of the institutional and community capacity for DRM. The information gleaned from the report describes organization and management capacity that is reasonably well developed at the institutional and community level. This is further supported by a broad legislative framework. However, the report highlights limitations in human capacity and capacity for mitigation and research.

The self-assessment or progress report on implementation of the HFA, undertaken at the country level, uses *community participation and decentralization through the delegation of authority* as one of the key priority action areas/indicators for the HFA. In this area, the progress report for 2009-2011 highlights a substantial advancement in the organizational structure of the NEMO, as well as the associated legislation which facilitates a fully participatory approach to DRR that involves district disaster committees and local government councils. The report also defines the level of progress reached in capacity development for various national agencies and highlights areas for further capacity building, such as policy, legislative and fiscal regimes; data and information management including capacity for research and systematic observation (e.g. pest and disease surveillance systems for agriculture and public health); and meteorological and hydrological monitoring (early warning systems at community level e.g. tsunami).

There is growing recognition that the development of DRR capacity is the concern of an entire society rather than of any single agency, area of professional discipline or stakeholder group. In view of the fact that DRM programmes are multi-disciplinary and multi-faceted, the country needs to have access to capacity development programmes that would enhance its capacity to undertake many of the technical tasks required for DRR implementation.

Developing institutional and community capacity at all levels (systemic, institutional and individual), including expanding the information and knowledge base, in terms of up-to-date scientific information, and local knowledge and expertise, still remains a key requirement for DRR. In particular, the areas of policy harmonization and institutional strengthening, with regard to science-based information for validating, monitoring and linking DRR with sustainable development using appropriate indicators of DRR, requires improvement. Capacity to undertake predictive analysis is also another area to be addressed and would require proper instrumentation for data collection and data management, including the development or expansion of computerized databases.

99 Risk Management Index = Total Score/Maximum Attainable Score - RMI_i = [T_{Si} / MAS_i]

The above mentioned are all consistent with the capacity building initiatives elaborated as outputs under the four (4) outcomes of the national CDM Strategy:

1. Enhanced institutional support for CDM program implementation at national and regional levels
2. An effective mechanism and programme for management and sharing of CDM knowledge established and utilized for decision making;
3. Disaster risk management mainstreamed at national level and incorporated into key economic sectors (tourism, health, agriculture, etc.);
4. Enhanced community resilience to mitigate and respond to the adverse effects of climate change and disaster.

7.5.1 Mapping institutions and levels of coordination

The various institutions and levels of coordination in the national structure for DRR have been mapped in **Figures 6.1** and **Figure 6.2** under **Section 6.3.1 National Structure for DRR**, which highlights the extent of collaboration across the range of DRR stakeholders: public and private sectors, scientific and technical institutions, community based organizations, universities, United Nations agencies, international cooperation agencies, Red Cross and Red Crescent societies, non-governmental organizations, DIPECHO partners, among others.

Section 7.4, Institutional Framework for DRR, describes the leading role of the National Emergency Management Organization (NEMO), which is a collaboration of Government, Non-Government, Faith Based organizations, Civil Society and many other citizenry groups and individuals, collectively responsible for having the country in a state of preparedness in case of an emergency; also responsible for responding to the needs of the country after a disaster and coordinating the response at local, regional and international levels. The NEMO Secretariat functions as part of the Office of the Prime Minister in the Ministry of Finance and Economic Affairs. DRR functions are also within the remit of many government ministries.

The wider framework for comprehensive disaster management depicted in **Figure 7.4**, further illustrates the interconnectedness of the regional and national structures for DRM.

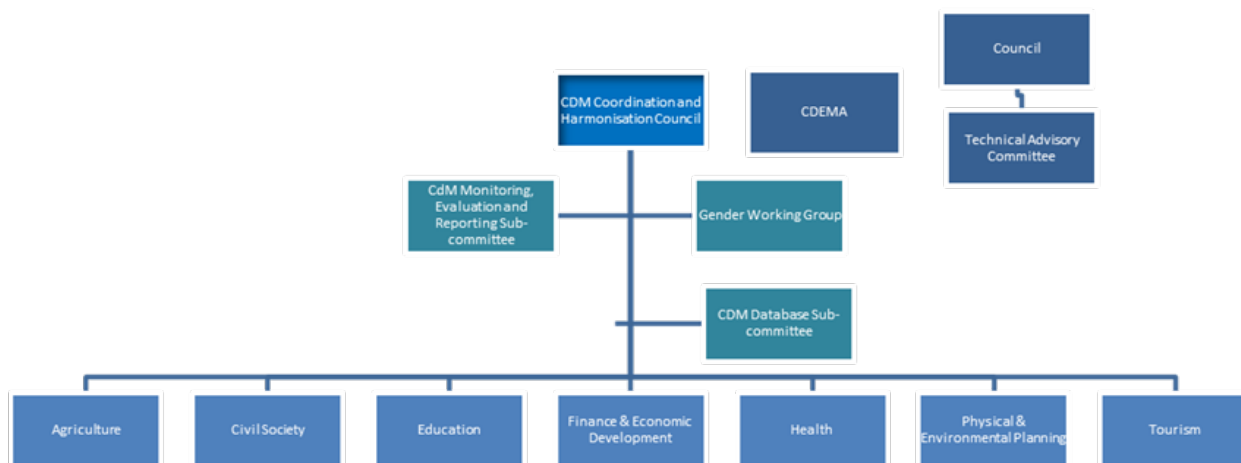


Figure 7.4 Comprehensive Disaster Management Framework

Source: CDM Strategy (2014-2024)

Regional co-operation in DRR is manifested by the country's membership and/or participation in the following regional mechanisms including Caribbean Disaster Emergency Management Agency (CDEMA); Pan-American Health Organization (PAHO), Regional Security System (RSS); Medical evacuation MOU with Martinique; and Monitoring support from the Seismic Monitoring Unit in Trinidad. The country also participates in regional programs and projects with DRR themes undertaken by regional and international agencies such as the Organization of Eastern Caribbean States (OECS), the Caribbean Development Bank (CDB), the United Nations Development Program (UNDP), and the Canadian International Development Agency (CIDA) all of whom foster collaboration and shared learning.

The National Emergency Management Plan which elaborates the National Emergency Management System, describes the levels of coordination for the various other institutions and agencies that currently have DRR related mandates in Saint Lucia, and highlights political administrative entities and the strategic partners involved.

The principal issue at this time appears to be how to effectively link international, regional and national actions to existing and projected resource support. At the national level, the challenge is that of incorporating DRR principles in development planning, decision-making and programme or project design so as to increase the likelihood of access to technical assistance programmes. It is proposed that this can be advanced through the pursuit of improved governance structures that provide a strategic framework for DRR principles to be taken into account into urban and rural planning and development activities, with dedicated disaster management structures at national, sectoral and community level, as a course of action for building resilience.

Best practice already exhibited within the existing governance structure for disaster management, provides a sound platform for an enhanced structure for more effective governance for DRR.

7.5.2 Mapping programs, initiatives and plans for DRR

Several initiatives in the form of programmes, plans, projects, application measures, have been undertaken at the local, national and regional level with regard to DRR and include measures to minimize vulnerabilities and disaster risks, and avoid (prevention) or limit (mitigation and preparedness) the adverse impacts of hazards.

Regional programmes and initiatives such as the CDEMA Comprehensive Disaster Management Framework, Caribbean Open Trade Support Program (COTS), OECS Disaster Response and Risk Reduction Programme, CDM Harmonised Implementation Programme (Phase 1), and Mainstreaming Disaster Risk Management in the OECS, have given specific focus to building national and community level resilience to disasters to contribute to sustainable development.

At the national level, Government programmes and projects such as the CDB funded Drainage Improvement, and World Bank funded Emergency Recovery and Disaster Management Project (ERDMP), Second Disaster Management Project (SDMP), and Disaster Vulnerability Reduction Project (DVRP), all aim to measurably reduce vulnerability to natural hazards and the adverse impacts of climate change in Saint Lucia. Activities involved significant physical prevention and mitigation works, and strengthening emergency preparedness and early warning systems, as well as training and capacity development for community based disaster management organizations, shelter managers and the staff of the National Meteorological Services (NMS)¹⁰⁰.

100 These include improvement of the drainage systems in Castries and Anse La Raye and relocation projects funded by CDB and Hewanorra Airport Flood Protection Works, Bridges and Rivers Training, Cul de Sac Flood Prevention Works, Supplementary Reservoir for Victoria Hospital, Disaster Management Programme such as retrofitting shelters, in particular schools and libraries, Study and Design of Coastal Protection for Dennery Village, strengthen and develop the early warning system of the National Meteorological Service (NMS).

The NEMO also continues to develop and revise national emergency management plans for specific hazards and sectoral/agency multi-hazard plans. A Disaster Recovery Policy and Plan is also currently being developed, aimed at integrating DRR measures into post disaster recovery and rehabilitation processes.

At the community level the NEMO has also facilitated a project funded by JICA for the implementation of a flood early warning system in Corinth, Gros-Islet. The SLRC has collaborated through DIPECHO funded projects in the development of model disaster plans for schools and assisted in the design of the first set of disaster programmes at the community level. More recently (2010-2012), the SLRC has worked with about ten (10) communities, in collaboration with NEMO groups, to undertake vulnerability and capacity assessments (VCA). Through this process, there has been capacity building at the community level for hazard identification and risk assessment, and for undertaking small-scale, community-level, hazard mitigation measures. The FAO has also undertaken projects aimed at resilience building in the agriculture sector, with outputs such as disaster resilient greenhouses and water harvesting systems for mitigating the impacts of climate change, such as drought. More recently (2014), the USAID/OFDA has also supported the implementation of rainwater harvesting systems in two communities in Saint Lucia (Choiseul & Laborie).

The National Meteorological Services is participating in a regional project (Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC)) coordinated by Caribbean Institute for Meteorology and Hydrology (CIMH), and which aims at enhancing resilience to reduce vulnerability in the Caribbean and creating a platform to assist with decision-making and enhance early warning systems.

More recently, Saint Lucia has identified under its SPCR (2010), CCA and DRR activities which include measures aimed at hard core adaptation such as coastal area management (including reef restoration, mangrove restoration, beach re-development,); building rehabilitation and retrofitting; slope stabilization and re-forestation; soft adaptation such as improving data and information management systems for strengthening Research and Systematic Observation (RSO); and Data and Information Acquisition and Knowledge Management for CCA, in particular, the Saint Lucia Integrated National GeoNode” (SLING)¹⁰¹. There has also been some adaptive research work undertaken on climate change impacts and adaptation to climate change by the Sustainable Development and Environment Department in conjunction with regional and international agencies that aims to improve the scientific basis for impacts, adaptation assessment and decision making. The scientific basis includes the evaluation of fitness for purpose of climate model data, climate downscaling, development of novel methods for assessment of impacts of climate change, especially on biodiversity and water resources, and adaptation, with a focus on robust decision making and challenges posed by large climate changes. Further, a scientific basis would promote the establishment of appropriate legislative, fiscal incentives and regimes to encourage the adoption of CCA and resilience building measures.

These initiatives reflect a growing commitment to multi-hazard mitigation, and will contribute in no small measure to the DRR process at the regional, national and local level.

101 See: <http://sling.gosl.gov.lc>; an open access platform for access, management and publication of geospatial data for informed decision making. SLING allows national ministries and agencies to populate, catalogue, view, and share data on a central depository. For the first time in Saint Lucia, GIS users, such as land planners and engineers, will be able to access, share, and apply data for disaster risk management applications such as land use maps, engineering designs, and risk assessments.

7.5.3 Inventory of tools

The *Methodological Guide on the Systematization of Tools for Disaster Risk Management*¹⁰² defines tools as “a guide, a product or instrument that stemmed from a project, initiative, programme, experience or intervention, and that serves to improve capacity to design, develop or implement actions to manage disaster risk”.

An updated compilation of an inventory of DRR tools for Saint Lucia is presented in **Table 7.5**. The classification for the types of tools in the compilation is based on the list of tools and resources selected for the B-Tool assessment for Saint Lucia, and which were identified as being necessary to effectively and efficiently manage the six components of disaster risk management activities.

Table 7.5 Inventory of DRR Tools and Resources for Saint Lucia

Type of DRR Tools/Resources	Specific Tools/Resources for DRR
Policies and Plans	<ul style="list-style-type: none"> a. National Hazard Mitigation Policy and Plan b. National Emergency Management Plan (NEMP) with specific hazard management plans, sector disaster management plans, and agency contingency and continuity of operations plans/ Revised NEMP c. Revised National Climate Change Policy and Adaptation Plan d. Strategic Plan for Climate Resilience (SPCR) e. National Social Protection Policy (2014) f. Revised 2nd National Biodiversity Strategy and Action Plan (2014) g. Revised National Land Policy (2014) h. National Invasive Species Strategy (NISS) i. Revised Investment Policy
Knowledge and Information	<ul style="list-style-type: none"> a. Public education and outreach (PEO) programmes for public and private sector agencies, CBOs, CDOs, children and schools. b. Communication strategies to engender behavioural change. c. Procedures for the exchange of relevant information during hazard events and disasters, and to undertake post-event reviews – DANA/DaLA d. Virtual libraries such as the Caribbean Disaster Information Centre (CARDIN) of the University of West Indies / DRR Centre and national and regional platforms for DRR and PreventionWeb¹⁰³ e. Decision support systems including GIS maps f. Saint Lucia Integrated National GeoNode” (SLING) - an open access platform for access, management and publication of geospatial data for informed decision making
Monitoring and Evaluation Tools	<ul style="list-style-type: none"> a. Risk Management and Vulnerability Benchmarking Tool (B-Tool) [developed by the OECs] b. Enhanced CDM Strategy monitored, evaluated and reported on using the Results Based Management (RBM) framework c. Periodic assessments conducted by CDEMA sometimes targeting specific activities or capabilities, such as Emergency Operations Centers (EOC) preparedness d. HFA Progress Reports e. ‘HFA Monitor¹⁰⁴’ - an online tool, developed by the UNISDR to enable governments to easily capture the information on progress in HFA and generated through a multi-stakeholder review process

102 Developed by the Regional Disaster Information Centre of Latin America and the Caribbean (CRID) as part of the UNISDR - DIPECHO South America 2011-2012 regional project: http://www.eird.org/wikiesp/images/Gu%C3%ADa_Metodol%C3%B3gica_para_la_Sistematizaci%C3%B3n_de_Herramientas_para_la_Gesti%C3%B3n_del_Riesgo_Noviembre_2011.pdf (only available in Spanish)

103 <http://www.preventionweb.net/english/>

104 HFA Monitor is accessible on the web at: <http://www.preventionweb.net/english/hyogo/hfa-monitoring>

Type of DRR Tools/Resources	Specific Tools/Resources for DRR
DRM Products	<ul style="list-style-type: none"> a. Sector Vulnerability and Assessment Reports for Climate Change, b. Community level Vulnerability and Capacity Assessments (VCAs) c. Drought and flood hazard maps for the island d. Volcanic atlas for the sub-region e. Caribbean Marine Atlas f. Damage Assessment and Needs Analyses g. Outputs of various investigative studies undertaken, especially with regard to disaster management, climate change, biodiversity and environment.

Many of the available DRR tools and resources have been validated at the regional, sub-regional and national level and are generally accessible. However, they tend to be utilized on an adhoc basis. For example, knowledge and information tools have not been used effectively to ensure the accessibility of information across the various levels of the society. Information generation tends to be project driven and as a result data and information is retained within the domain of the sector or agency with responsibility for the specific project, and with no formal mechanisms to promote information sharing and networking.

Thus, there is need for the application of these tools and resources to be undertaken in an organized, structured and programmatic way, for informed decision-making with regard to development planning and policy making, public education and outreach, and validity and suitability of DRR interventions. Harmonization and standardization of information systems and other ICT protocols at the regional, national and local level also needs to be pursued. Multi-hazard maps based on more appropriate models; events mapping to validate the same; detailed digital elevation models (DEMs); up-to-date land use maps and proposed development plans are also necessary for informed decision-making with regard to risk management and validity and practicality of DRR interventions. Further, many of these tools will require regular updating.

Greater use also needs to be made of experts in the fields of information and communication for the development of more applicable tools and resources. Coherence in DRR related national policies and plans is also required to promote the systematic incorporation of risk reduction approaches into the design and implementation of emergency preparedness, response, mitigation and recovery and reconstruction programmes.

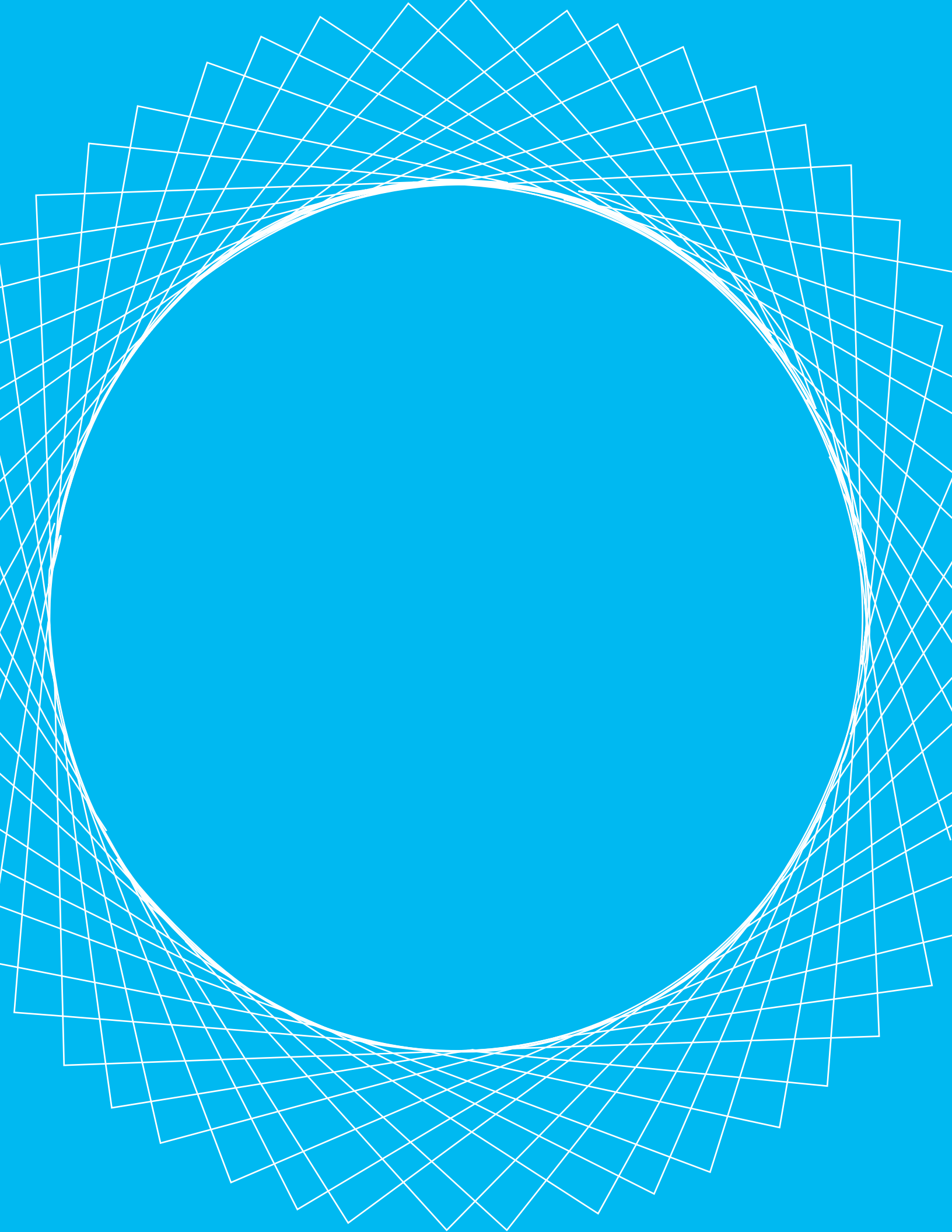
7.6 REDUCTION OF UNDERLYING RISK FACTORS

To date, the HFA progress reports have shown a growing concern for reducing disaster risk, with significant progress made against the objectives, goals and priorities of the Hyogo Framework for Action. One example is the measurable progress in the reduction in the number of deaths linked to hydro-meteorological hazards as a result of better understanding and improved preparedness and early warning systems. However, while there has been real progress made in early warning, preparedness and response; there remains an urgent need to address underlying risk drivers and investment in DRM particularly at the sectoral and community level.

The following identifies some components, based on the basic indicators of the HFA Monitor, which are considered important in reducing the underlying risk factors:

- a. Disaster risk reduction enshrined into environment related policies and plans, including for land use, natural resource management and adaptation to climate change.
- b. Social development policies and plans implemented to reduce the vulnerability of populations most at risk.

- c. Economic planning and management of human settlements to incorporate disaster risk reduction elements, including enforcement of building codes.
- d. Disaster risk reduction measures integrated into post-disaster recovery and rehabilitation processes.
- e. Procedures in place to assess and mitigate disaster risk impacts of major development projects, especially infrastructure.



8. Risk assessment for country DRR

8.1 DEFINING CRITERIA AND ANALYSIS METHODOLOGY

Defining criteria for disaster risk analysis and management is for the most part difficult, due to the lack of a comprehensive conceptual framework of disaster risk that facilitates evaluation and intervention from a multidisciplinary perspective. Most of the available indices and evaluation techniques are not capable of presenting risk in terms that are easily interpreted by the diverse types of decision-makers. Risk need to be identified and interpreted in a manner that attracts the attention of the stakeholders and enables them to move forward decidedly in the reduction of disasters¹⁰⁵.

There is also much difficulty in defining practical indicators and identifying how these should be applied and who should be responsible for monitoring. The issue of identification of indicators for risk assessment and monitoring progress in risk reduction is made even more complicated by political considerations, data availability and quality, resource availability, issues of scale, ownership and a host of other social, organizational and management concerns.

The country, in-keeping with the Disaster Management Act No. 30 of 2006 has developed a *National Risk Register*. There is also a *Saint Lucia National Climate Change Risk Register*, dated October 28, 2008.¹⁰⁶ Of note, is that the National Risk Register was purposed to assist disaster responders in identifying potential significant risks threatening the performance of critical functions in the event of an emergency, which ought to enable them to focus resources in the right areas, and develop appropriate continuity strategies.

The methodology for formulating the register involved a literature review, which combined the identification of past events together with subjective hazard analysis within the context of the probability of a repeat event. Due to a lack of data on parameters needed to derive measurable risk management indicators, the use of qualitative indicators measured on subjective scales was unavoidable. Consequently, the weighting or considerations of many of the indices have been undertaken using expert opinion and informants at the national level. There has been little analysis using numerical techniques that are consistent from the theoretical and statistical perspectives.

Criteria for risk management and vulnerability benchmarking as defined in the risk management framework adopted by the Inter-American Development Bank (IDB) (See Table 8.1) were utilized in the B-Tool Country Assessment (2007)¹⁰⁷ as a context for assessing and evaluating risk.

105 Summary report for session "Visions of Risk and Vulnerability: Patterns, Trends, and Indicators", World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan, January 18-22, 2005.

106 Information provided in the document is deemed valid only at the date of publication as risks are intended to be monitored on an ongoing basis.

107 USAID/OECS, 2007. Risk Management Benchmarking Tool (B-Tool), National Assessment: Saint Lucia

Table 8.1 Key Components of Risk Management – IDB/B-Tool

Pre-Disaster Phase			Post-Disaster Phase		
A. Risk Identification	B. Risk Mitigation	C. Risk Transfer	D. Disaster Preparedness	E. Emergency Response	F. Rehabilitation and reconstruction
1. Hazard assessment (frequency, magnitude and location)	1. Physical and engineering mitigation works	1. Insurance and reinsurance of public infrastructure and private assets	1. Early warning and communication systems	1. Humanitarian assistance	1. Rehabilitation and reconstruction of damaged infrastructure
2. Vulnerability assessment (population and assets exposed)	2. Land-use planning and building codes	2. Financial market instruments (catastrophe bonds and weather-indexed hedge funds)	2. Contingency planning (utility companies and public services)	2. Clean-up, temporary repairs, and restoration of services	2. Macroeconomic management (stabilization and protection of social expenditures)
3. Risk assessment (a function of hazard and vulnerability)	3. Economic incentives for pro-mitigation behavior	3. Privatization of public services with safety regulation (energy, water and transportation)	3. Networks of emergency responders (local and national)	3. Damage assessment	3. Revitalization for affected sectors (exports, tourism, and agriculture)
4. Hazard monitoring and forecasting (mapping, and scenario building)	4. Education training and awareness about risks and prevention	4. Calamity Funds (national or local level)	4. Shelter facilities and evacuation plans	4. Mobilization of recovery resources (public, multilateral, and insurance)	4. Incorporation of disaster mitigation components in reconstruction activities

The methodology for the B-Tool assessment of risk involved the formulation of a series of management questions that aim to explore the adequacy and content of current disaster risk management tools and resources of the country in each of the six disaster management phases. The methodology includes a scoring system. The questions were phrased to highlight best practices and recommendations for disaster risk management activities. The tool contains a list of easily understood questions that were chosen through extensive review of risk management literature and broad-based consultation.

The aforementioned methodologies, among others, and tools for technical support exist for risk assessment and analysis and those can facilitate effective DRR interventions at the local and national levels.

Reference is further made to the IDB system of Indicators of Disaster Risk and Risk Management, which involves a more analytically rigorous and data driven approach to risk management decision-making. However, at present, in-depth analyses using the IDB risk indicators cannot be readily pursued, due to a lack of data, and insufficient skills for undertaking such analyses.

8.2 DEFINITION OF RISK SCENARIOS

Broad definitions of risk scenarios for the country have been attempted in the National Risk Register and the National Risk Register for Climate Change. Hazard/risk mapping also define geo-spatial scenarios for phenomena such as landslide, drought, and floods.

Risk scenarios for climate change have been further defined for the country in the Saint Lucia Second National Communication (SNC) under the UNFCCC¹⁰⁸. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) makes reference to a number of direct observations of recent changes in climate which are likely, to very likely¹⁰⁹, attributable to human influence. These observations include, among others, changes in wind patterns, rainfall distribution and air temperature. The climate baseline for Saint Lucia with regard to these parameters and the platform for determining how the parameters are influenced by climate change are provided in the SNC. Outputs describing the current and future climate change scenarios¹¹⁰ generated for the island are presented in Saint Lucia's SNC. The various scenarios or models¹¹¹ used to define climate change risks, have all demonstrated that mean temperatures in Saint Lucia are expected to increase markedly over the next century¹¹². The scenarios derived from the various models also describe a discernible shift in the precipitation climatology.

There is a distinct need to define risk scenarios for other non-climate related hazards, based on a holistic approach that will enable multi-hazard analysis and promote more effective, fit-to-purpose solutions/ interventions. Due consideration must also be given to the fact that risk is clearly most detailed at a micro social or location/site specific scale.

8.3 PRIORITIZATION OF RISK SCENARIOS AND AREAS OF INTERVENTION

Saint Lucia is a country with limited experience in the area of disaster risk analysis. Limited prioritization of risk has been attempted in the National Risk Register (2006), which identifies risk ratings for main hazards/ threats for the country. **Table 8.2** provides a summary of the main categories of hazards/threats identified with a brief description of the process or phenomenon and the risk rating for each threat/hazard.

108 GOSL, 2009. Saint Lucia Second National Communication under the UNFCCC.

109 In the IPCC Summary for Policymakers, the following terms have been used to indicate the assessed likelihood, using expert judgment of an outcome or a result: Virtually certain > 99% probability of occurrence, Extremely likely > 95%, Very likely > 90%, Likely > 66%, More likely than not > 50%, Unlikely < 33%, Very unlikely < 10%, Extremely unlikely < 5%.

110 Saint Lucia Current Climate and Future Projections. Prepared by the Climate Studies Group (CSG) of the University of the West Indies (UWI), Mona Campus.

111 Global Climate Models (GCMs) and Regional Climate Model (RCM)

112 This will require Saint Lucia to adjust its building designs, using natural ventilation or energy efficient cooling systems.

Table 8.2 Main Categories of Hazards/Threats Identified for Saint Lucia

Type of Emergency/ Hazard	Category of Emergency/ Hazard	Sub-Category of Emergency/Hazard	Risk Rating
Natural Disaster and Severe Weather	<ul style="list-style-type: none"> ▪ Geodynamic/Geological hazards: 	<ul style="list-style-type: none"> ▪ Landslides ▪ Earthquakes ▪ Volcanic activity ▪ Tsunamis ▪ (Hydro-meteorological factors are important contributors to some of these processes.) 	<ul style="list-style-type: none"> ▪ Medium - High ▪ Low ▪ Low ▪ Low
	<ul style="list-style-type: none"> ▪ Hydro-meteorological hazards: 	<ul style="list-style-type: none"> ▪ Hurricane high winds ▪ Coastal Flooding ▪ Flooding of Rivers/Streams ▪ Flash Flooding ▪ Extreme High Temperatures ▪ Drought ▪ Extreme weather events ▪ Sea Level Rise ▪ Storm Surge ▪ Coastal Erosion 	<ul style="list-style-type: none"> ▪ High ▪ High ▪ High ▪ High ▪ High ▪ High ▪ High ▪ High ▪ Medium ▪ Medium ▪ Medium
Anthropogenic/ Man-made	<ul style="list-style-type: none"> ▪ Socio-natural hazards: High population density living in unplanned or informal settlements with inadequate basic-service provision leading to public security and safety and mass casualty 	<ul style="list-style-type: none"> ▪ Environmental Degradation <ul style="list-style-type: none"> ○ Deforestation ○ Uncontrolled/rapid unplanned and informal development ○ Poor waste management ▪ Transportation accidents (land, sea, air) ▪ Civil disturbance ▪ Disruption of Energy and Supplies ▪ Structural Emergency 	<ul style="list-style-type: none"> ▪ Medium - High ▪ Low ▪ Low ▪ Low ▪ Low
	<ul style="list-style-type: none"> ▪ Technological hazards: (intentional or unplanned) 	<ul style="list-style-type: none"> ▪ Fire and Explosion ▪ Environmental Pollution: Harmful release – CBRNE Toxic spills Geothermal prospecting Illegal dumping ▪ Data and Information Security ▪ Terrorism – bio-terrorism 	<ul style="list-style-type: none"> ▪ Medium ▪ Medium ▪ Medium
Health Emergencies	<ul style="list-style-type: none"> ▪ Pandemic: Epidemic ▪ Biological hazards 	<ul style="list-style-type: none"> ▪ Public/Human Health <ul style="list-style-type: none"> ○ Animal Health – (zoonotic diseases) ○ Plant Health ▪ Adverse impacts of GMOs, LMOs and SMOs 	<ul style="list-style-type: none"> ▪ High ▪ High ▪ Medium

Hydro-meteorological hazards and health emergencies were given high risk ratings. Geodynamic/Geological and socio-natural hazards were rated between medium to low risk, with the exception of deforestation, which was rated a high risk hazard. Technological hazards were deemed to be medium risks, but terrorism was unrated, due to the sensitivity of this area.

In addition, the National Risk Register for Climate Change identifies seven (7) potential hazards across nine (9) critical sectors (Table 8.3).

Table 8.3 Potential Hazards Across Critical Sectors

Climate Change Impacts/Hazard Identification		
Storms/Hurricanes: Storm Surge Coastal Erosion High Winds	Precipitation: Floods Droughts	Temperature: Extreme High Temperatures Cold Spells
<u>Critical Sectors</u>		
Agricultur Financial Forestry and Biodiversity Marine and Coastal Resource	National Security	Tourism Health Water Resources Coastal Zone and Human Settlements

Areas of intervention proposed as derived from the SNC process are elaborated in the SNC Report and include the enhancement of resilience at various levels of society, through tangible interventions; capacity development; education and awareness; research and knowledge management; efficient resource allocation; and the coordination and integration of climate risk management considerations with socio-economic development policies and environmental conservation at the national and local scale.

The various assessments of risk management capacities also provide a basis for the identification of areas for intervention for reducing disaster risk and building resilience. Table 8.4 provides an empirical comparison of the various capacity assessments undertaken to date utilizing both quantitative and qualitative outputs for the various capacity areas and tools. The methodology for undertaking the comparative assessment involved a literature review, which combined the identification of key capacity areas and tools from the B-Tool Country Assessment Report (2006), CDM and HFA qualitative reporting, together with the qualitative analysis from stakeholder consultation during the process for updating of the SLU DRR-CD.

The assessment ratings of High (H), Medium (M), and Low (L), are based on a subjective measure of resilience¹¹³ or adequacy of coping capacities at both the national and community level, with regard to level of organization, social networks, abilities, leadership, diversified economy, contingency plans and financial mechanisms, among other parameters.

113 The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (UNISDR 2009).

Table 8.4 Comparison of Capacity Areas based on the Capacity Assessments

DRR Capacity Area/Tools	B-Tool (2006)	CDM Audit (2010)	HFA	SLU CP-DRR Process
Policies and plans	L	M	H	H
Standards and regulations	M	L	M	M
Legislation	M	M	M	M
Human Capacity	H	L	L	L
Financial Resources	L	L	L	L
Technical Tasks and Contents	M	L	L	L
Public Education and Awareness	M	M	M	M
Infrastructure Development/Investments	-	M	L	L
Administrative Arrangements	-	M	H	M
Assignment/Execution of Responsibilities	M	M	M	L
Stakeholder Participation	H	H	H	M
Information Management	L	L	L	L
Monitoring and Evaluation of Programmes	H	M	L	L
Effective use of DRM Products	H	M	L	L

Legend: Coping Capacity: H- High; M- Medium; L-Low

The comparative assessment emphasizes the limitations in human capacity, technical tasks and contents, financial resources and information management, as determined by most other assessments conducted.

The HFA national reports, which commenced the biennial cycle of reporting in 2009, revealed that significant progress has been made in early warning, preparedness and response, with one notable effect of the HFA process being the bringing together of many stakeholders in DDR including national and local governments, parliamentary forums, inter-governmental organizations, non-government organizations, community-based organizations, practitioners, private sector, academic and technical institutions, the media and international organizations. However, the reports note that the country is still struggling to address underlying risk drivers, vulnerability and resilience building issues and that public awareness is still not adequately addressed. Further, there is still limited investment in DRM particularly at the sectoral and community levels.

Presently, there is limited analytical basis for targeted policy and programme development for areas, sectors and populations most economically and socially at risk to disasters. However, the current broad level risk analysis, including the consideration of the components of the IDB Risk indicators, can point to the aspects of DRR implementation that require efforts to improve and create an appropriate National DRR framework. Further, the country presents predominant conditions of high exposure and susceptibility, social fragility and lack of resilience that favour risk accumulation and incapacity to respond to disasters. It is also apparent that while the country's risks from a macro-economic and financial perspective in terms of responding to catastrophic events may decrease, the country still does not have resources to face catastrophic events.

The Disaster Management Policy Framework approved by Cabinet in 2009, identified priorities for achieving the objectives of the Policy, that is to advance an approach to disaster management that focuses on reducing risks such as reducing loss of life, economic disruption and damage to the environment and property, especially

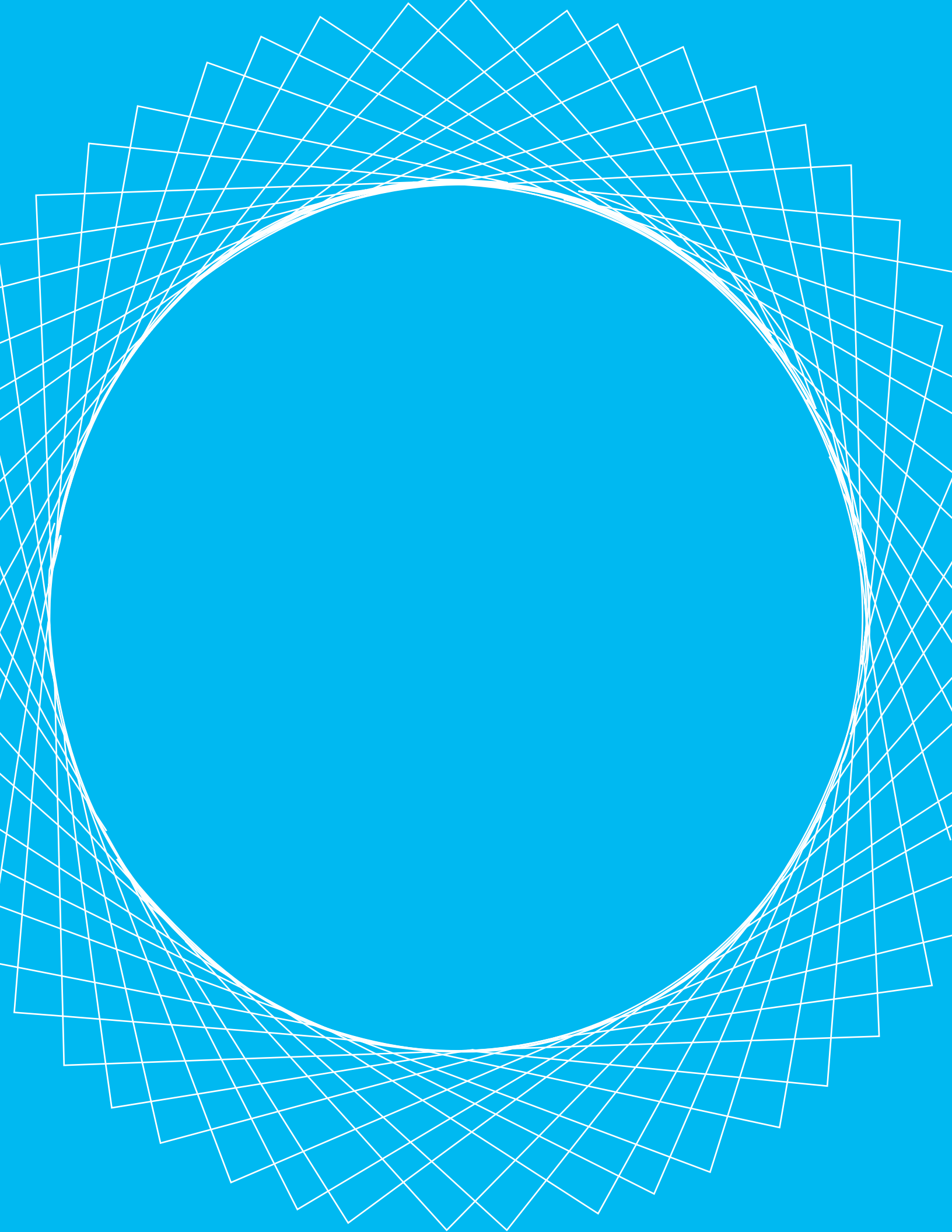
to those sections of the population who are most vulnerable due to poverty and a general lack of resources. These priorities, which also point to areas for intervention, are consistent with those emanating from the B-Tool assessments, SNC and HFA monitoring reports, and include:

- a. Timely, coordinated and focused direction of resources towards the effective operation of the disaster management system
- b. Maintenance of institutions that are technically capable of efficiently executing the comprehensive disaster management programme
- c. Development of local expertise capable of operating and maintaining the disaster management system
- d. Ensuring that the public is well informed and educated about disasters, their consequences and preventive and mitigation measures
- e. Creation of an environment in which the private and non-government sectors contribute meaningfully to the comprehensive disaster management effort.

The HFA has also assisted in making more explicit linkages between DRR and managing climate-related risks and CCA. Hence, due consideration is also given to the Inter-governmental Panel on Climate Change Special Report on Managing the Risk of Extreme Events and Disasters (IPCC/SREX) [Summary released in November 2011], which demonstrates that many measures to address natural hazard risk such as good land use planning, environmental protection, preparedness and early warning systems are also effective no-regret actions for adaptation to climate change. The HFA is also recognized as a pillar by parties to the UN Framework Convention on Climate Change with regard to efforts to adapt to climate change.

The 2011 Global Assessment Report (section “Revealing risk: Visible trade-offs for informed choices”) highlights some key issues for consideration with regard to risks:

- a. The sheer scale of recurrent and probable maximum losses should be enough to shock governments into action.
- b. Governments are liable for a significant part of total expected losses and they rarely have the contingency financing to match this liability.
- c. Governments need to decide how much risk they are willing to retain and how much they can afford to transfer.
- d. A balanced portfolio of prospective, corrective and compensatory risk management strategies is the most cost-effective way to reduce disaster risks and support development.



9. Strategic guidelines for country DRR

9.1 STRATEGIC DIRECTIONS FOR COUNTRY DRR

One of the aims of adopting a DRR approach is to help countries transform to a sustainable disaster resilient development path. The evidence for Saint Lucia to invest in DRR is clear as risks are increasing. Increasing risks is evidenced by the increase in occurrence and the demonstrable severe impacts of multiple disasters, with regard to rising socio-economic losses related to sharp rises in damage to housing, critical local infrastructure and public assets (such as bridges, schools and health facilities), and the likelihood of further exacerbation by the impacts of climate change. The future level of vulnerability of Saint Lucia will also depend on its development path.

A national CDM strategy has been endorsed through high level consultations in country since 2001, but progress in integrating disaster management into the planning process has been apathetic. One explanation advanced was that the required political leadership and technical capacity to implement the type of activities identified were inadequate to enable the requisite paradigm shift. The absence of “highly influential champions” for the process, especially within the political arena, has prevented DRR from being elevated to the political agenda in the country. There is need to leverage new entry points for DRR by taking advantage of the new directions for DRR in the country’s CDM Strategy, and integrating them into existing mechanisms, for development decision making and planning, including that for CCA.

The country document for Saint Lucia (prepared in 2012) and the Criteria applied under the 2013-2014 DIPECHO Action Plan were used to identify DRR opportunities. The documents highlight the need for legal and institutional strengthening, information, education and communication, hazard, risk and vulnerability assessments as key areas for attention (Figure 3). Capacity strengthening, baseline data development and local disaster management were among the most highlighted opportunities for intervention.

Further elaboration of the strategic directions and guidelines are presented under the five (5) elements of DRR in Table 9.1.

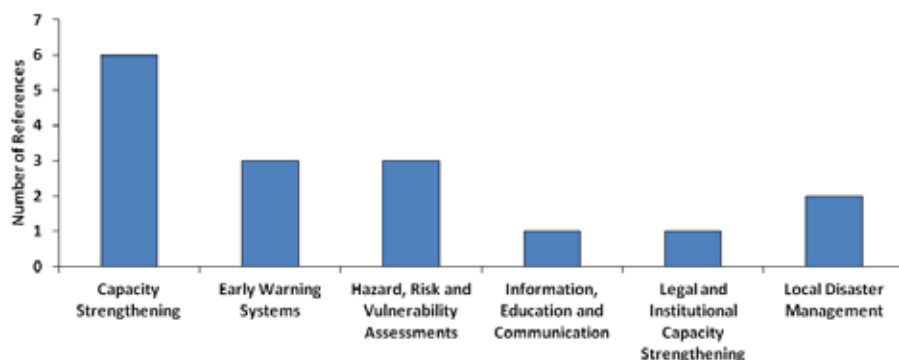
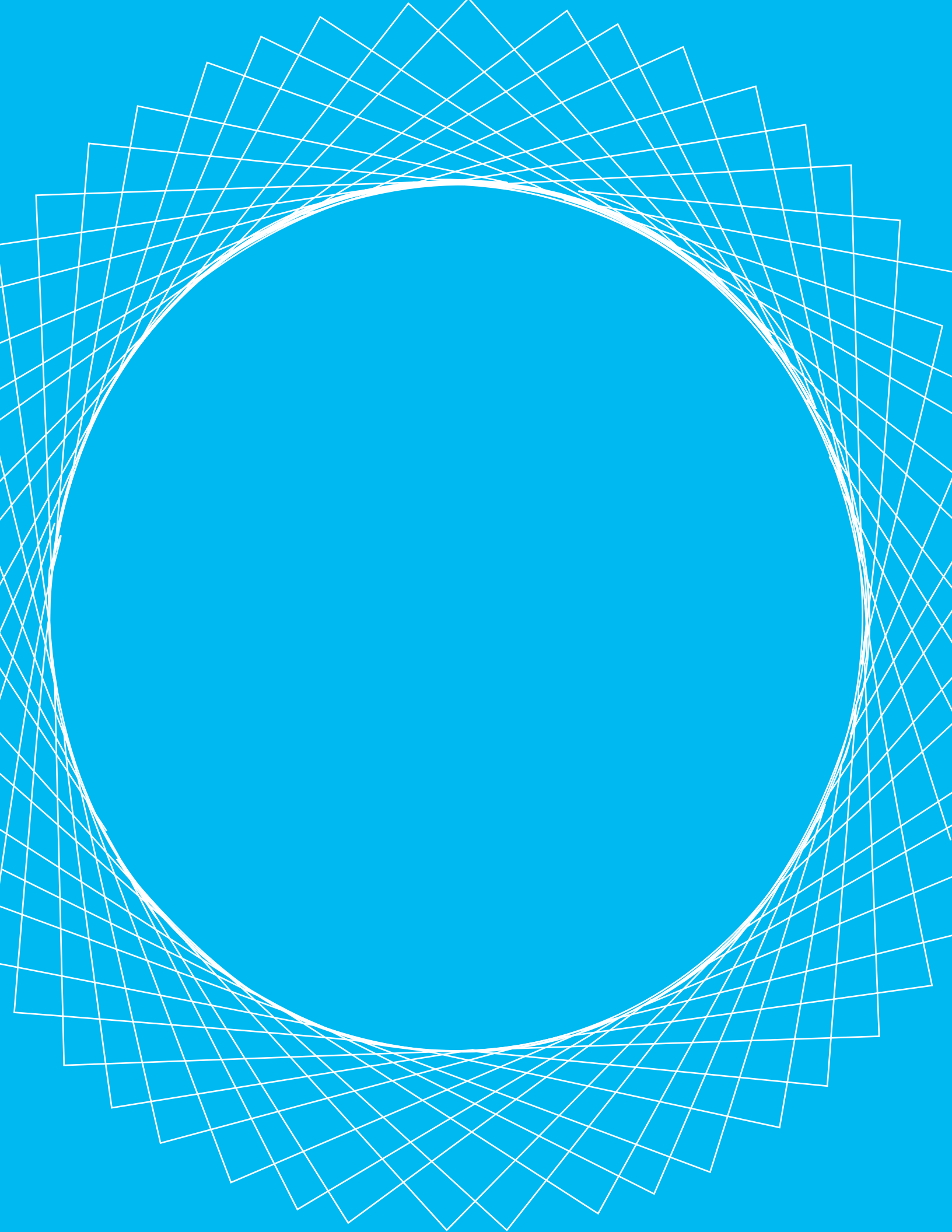


Figure 2. Key DRR Focus Areas for Saint Lucia

Table 9.1 Strategic Directions and Guidelines for DRR in Saint Lucia

DRR Elements	Strategic Direction	Strategic Guidelines/Actions
Risk Awareness and Assessment	Improve information on how hazards are changing with detailed risk assessments from diverse sources of knowledge	<ul style="list-style-type: none"> a. Enhance the national disaster inventory system to systematically monitor losses and assess risks at all scales using probabilistic models for regular updating of national risk register and risk forecasting. b. Recover, adopt and enhance existing risk analysis methodologies. c. Develop country-appropriate risk Indicators/Indices. d. Undertake risk mapping - of social vulnerability. e. Conduct multi-hazard analysis and vulnerability and capacity assessments.
Knowledge Development	Build adaptive capacity with new skills, knowledge and resources	<ul style="list-style-type: none"> a. Enhance decision support systems such as GIS to generate spatial data and information on different disaster risk and vulnerability scenarios at regional, national and local/community levels. b. Improve and expand data monitoring networks – monitoring indicators: endangered resources; livelihoods; etc. to support effective research and systematic observation (RSO). c. Establish protocols and mechanism for data and information sharing and dissemination. d. Develop structured and targeted public education and outreach programmes with special focus on vulnerable groups, to provide information on disaster risks/vulnerabilities and measures to reduce risk and manage disasters to prompt behavioural change. e. Create appropriate mechanisms/platforms for sharing local and traditional knowledge and experiences.
Public Commitment and Institutional Frameworks	<p>Improve governance structures to empower and support communities to address root causes of vulnerability through increased access to resources and promotion of environmentally sound development</p> <p>Build participatory risk governance capacities</p>	<ul style="list-style-type: none"> a. Demonstrate political leadership and will by placing policy responsibility for DRR and CCA in a core ministry with a high level of political authority over national development. b. Harmonize national and sectoral policies to achieve coherence in policies to stimulate and enforce DRR processes. c. Address legislative/ regulatory shortcomings. d. Support strengthening of sub-regional mechanisms in order to achieve the objectives of the HFA and the Regional Strategy for Disaster Risk Reduction. e. Regulate/manage urban and local development with DRR instruments and mechanisms such as building codes and land use planning. f. Urgently integrate risk reduction strategies into all aspects of development planning and activities. g. Commit resources for the upkeep and upgrading of the NEMO and other components of the national disaster management framework for effective implementation of DRR functions. h. Build risk governance capacities through the institutionalization of multi-sectoral, multi-stakeholder national, and community platforms for DRR. i. Decentralize DRM functions through an incremental approach in shifting the culture of public administration to engage citizens and communities in local governance, with appropriate devolution of budgets, etc. j. Increase country investments in DRR through the allocation of a percentage of the national budget and other revenue dedicated to DRR and incorporate in financial reporting. k. Identify areas for risk transfer in key productive sectors such as tourism and agriculture. l. Continue to mobilize political support, and to advocate for international community, institutions and development partners to support the country's efforts to institutionalize DRR.

DRR Elements	Strategic Direction	Strategic Guidelines/Actions
Application Measures	Investment in hazard mitigation/resilience building measures in all public and private development planning initiatives, programmes and budgets. - Use of DRR technologies - Energy safeguarding - choice of alternative technologies to minimise impacts of other hazards (e.g. wind power)	<ol style="list-style-type: none"> a. Provide for a Mitigation Officer to coordinate and champion Mitigation . b. Undertake community level VCAs and utilize in participatory planning and budgeting to upgrade informal settlements and identify and allocate safe land for low income citizens and promote safe building. c. Environmental/health management through protection of ecosystems and natural resources (e.g. watersheds, forests, reefs, beaches, wetlands) to mitigate impacts of floods, storm surge and other hazards. d. Enhance programmes for social protection such as poverty reduction initiatives, temporary employment schemes, bundling of micro-insurance and loans, among others. e. Encourage economic development and alternative livelihoods in rural areas and smaller development areas (villages, districts) in order to reduce the pressure of accelerated migration to high-risk peripheral areas and informal settlements. f. Increase capital investment in climate/disaster resilient infrastructure that reduces risk of national assets and critical facilities. – e.g. flood mitigation interventions, retrofitting, renovation and renewal of schools and health facilities.
Early Warning Systems	Improve forecasting, dissemination and preparedness measures and reaction capacities	<ol style="list-style-type: none"> 1. Enhance and expand the sphere of early warning systems and emergency management capacities for vulnerable communities/ areas for various hazards especially storms and floods, as well as tsunamis and volcanic events. 2. Improve or expand data collection hydrological and meteorological monitoring networks at both national and regional scales.



10. / Conclusions and recommendations /

10.1 CONCLUSIONS

- a. DRR implementation is cross-sectoral in nature and the impacts of poor development planning are usually manifested in effects on the country's natural resources and the population. These impacts may be further exacerbated by the realities of indirect drivers emanating from physical, social, economic, environmental and political factors. At present, considerations for disaster prevention, mitigation or preparedness are not formally and routinely integrated into the appraisal of projects or programmes, particularly those financed by public investments in; for example, infrastructure, health and education. This suggests that costs for rehabilitation post disaster, simply recurs as opposed to the country investing in climate resilient projects or programmes.
- b. Findings of the 2011 Global Assessment Report for DRR (GAR, 2011) show that while great strides have been made in reducing loss of life, for at least weather related disasters, the reality remains that disaster-related socio-economic losses continue to rise. This is particularly so in a developing country such as Saint Lucia where damage to housing and critical local infrastructure and public assets such bridges, schools and health facilities has risen sharply¹¹⁴. Thus a critical focus of DRR implementation will be to increase

"The good news is that a natural hazard does not automatically have to lead to a disaster," Mr. Ban Said. "Countries such as Bangladesh, Cuba, Jamaica, Madagascar and the Philippines have shown that good building designs, proper land-use planning, public education, community preparedness and effective early warning systems can reduce the impact of severe weather events."

UN Secretary-General Ban Ki-moon 30 September 2008.

capital investment in infrastructure and critical buildings, particularly with regard to CCA, build economic resilience through increase business opportunities and employment, and environmental and social resilience by ensuring balanced ecosystems through natural resource management.

- c. The implementation of DRR functions calls for a coordinated, broad-based, multi-sectoral response aimed at mainstreaming DRR issues into the planning and development process. The perception of, and response to these existential threats must pervade the national planning process, the operations of government agencies, the practices of the commercial/private sector and the actions of all citizens and communities, from where and how they choose to manage risks.
- d. The SLU DRR-CD has endeavoured to provide recommendations on the type of DRR construct that is results oriented and strategic in terms of its impact. The Document provides a basis for identifying potential areas to address the key knowledge, research and capacity needs of the various actors, to effectively mainstream and implement DRR into national development planning and processes for the realization of sustainable disaster resilient development.

114 Over the past three decades, the risk of economic loss as a result of floods rose by over 160 per cent, while economic loss incurred as a result of cyclones surged by 265 per cent in member countries of the Organisation for Economic Cooperation and Development (OECD). UN.2011 Global Assessment Report (GAR) on Disaster risk reduction (DRR) – Revealing Risks, Redefining Development. UNISDR.

10.2 RECOMMENDATIONS

- a. It is clear that a re-shaping of the policy mix to reflect the changing climate and disaster risk management context is needed to provide a strategic framework for action that will promote social and environmentally sound development, through the resourcing and empowering of local/community level institutions for building the resilience of citizens and the state.
- b. It is also apparent that the risk of losing wealth to natural disasters is beginning to outpace wealth creation, and as advocated, DRR must be incorporated in all sustainable development strategies¹¹⁵, to protect development gains and avoid diversion of development resources to disaster response and recovery.
- c. The awareness of, and response to risks/threats must pervade the national planning process, the operations of government agencies, the practices of the commercial/private sector and the actions of all citizens with regard to mitigation and transfer of risks.
- d. As financial resources continue to decline, the GOSL, like all other governments, will continue to be driven to increasingly give consideration to resilience building. Accounting for disaster losses is a first step towards taking responsibility for, and assessing disaster risk for successful resilience building. Adapting existing development instruments such as national public investment planning, protecting vulnerable and critical infrastructure, promoting sustainable land use management/planning and forest management, ensuring security of water supply and water resources and other ecosystem services, and collecting and analyzing climate change and disaster related data and information in a comprehensive and sustainable fashion can help to scale up DRR efforts to safeguard the many risk-prone citizens. Such strategies reduce disaster risk and strive towards the objectives of the HFA, and are also important for adapting to climate change and achieving the Millennium Development Goals”¹¹⁶.
- e. It is anticipated that the beneficiaries will utilize the observations made regarding the key drivers of risk, in particular, the current policy environment, the organizational framework and institutional and individual capacities, gaps and constraints to pursue real capacity enhancement and improve practices and skills in a manner to ensure that the desired improvements in DRR implementation can be achieved.
- f. The singular risk is that observations and outputs presented in the DRR-CD may not be effectively applied by the beneficiaries and potentially lose validity, unless the requisite efforts are made to fully integrate them into a functional framework for addressing current gaps and constraints. Additional sensitization and training may well be required to enhance stakeholder awareness and education with regard to the benefits of a DRR approach that would further enhance the application of outputs.
- g. The NEMO, as the lead agency for disaster mitigation and prevention, will seek to drive the process to generate the level of commitment required by the GOSL. Further, the NEMO will collaborate and coordinate with other agencies responsible for national development and development partners, to promote their relevant roles and capacity enhancement, to ensure a well-constructed framework, integrating elements of policy, institutional structures and processes, and organizational and individual capacities, to effect

115 Nassir Abdulaziz Al-Nasser, President of the General Assembly for RIO +20 Conference in thematic debate on disaster risk reduction: “addressing disaster risk reduction is therefore inseparable from the broader sustainable development agenda.”

116 UN 2011, 2011 Global Assessment Report.

a more coordinated **multi-hazard** response to DRR implementation for the realization of sustainable disaster resilient development.

- h. The NEMO will also continue to actively demonstrate the need for requisite and concrete resources (human, technical and financial) to be committed and reflected within budgetary processes to create the enabling environment for the implementation of DRR activities, including adequate human, technical and financial resources.



APPENDICES

Appendix 1

GLOSSARY OF TERMS

Anthropogenic hazards

Hazards created through the action of human activity (Baastel-ESL and Stakeholders)

Capacity

Physical social, economic and institutional means as well as skilled personal or collective attributes such as leadership and management (ISDR)

Capacity building

Efforts aimed to develop human skills or societal infrastructures within a community or organization needed to reduce the level of risk. Capacity building also includes development of institutional, financial, political and other resources, such as technology at different levels and sectors of the society. (ISDR)

Comprehensive Disaster Management (CDM)

Comprehensive Disaster Management which includes attention to all phases of the Disaster Management Cycle – prevention, mitigation, preparedness and response, recovery and rehabilitation (CDERA). It includes emphasis on reducing risk. This nomenclature is the term that reflects the global trend in the discipline for increased focus on risk management and the intense desire among disaster management Stakeholders in the Caribbean to accelerate initiatives in promoting disaster loss reduction. DRM as defined by ISDR is explained below.

Community Resilience

The ability of a community to cope with the effects of a hazardous event through appropriate prevention, mitigation, preparedness, and response and recovery mechanisms (adapted from WCDR)

Coping Capacity

The means by which people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards (ISDR)

Disaster Risk Management (DRM)

The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards. (ISDR)

Disaster Risk Reduction (DRR)

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. DRR involves:

- Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis;
- Knowledge development including education, training, research and information;
- Public commitment and institutional frameworks, including organizational, policy, legislation and community action;
- Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
- Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities (ISDR)

Early Warning

The provision of the means by which people or organizations, use available resources and abilities to face adverse consequences that could lead to a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and human-induced hazards (ISDR)

Hazard:

The potential to cause harm; **(risk on the other hand is the likelihood of harm).**

Intermediate Results (IRs)

Interim Targets set to measure progress toward achievement of Strategic Objective (CDERA CDM Strategy)

Mainstreaming

Making Comprehensive Disaster management an integral dimension of the policies and programmes in all political, economic and societal spheres (BCPR)

Mitigation

Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards (ISDR)

National Disaster Organization (NDO)

The NDO in this document refers to the national organizational structure of agencies linked for the purpose of attending to the legal, institutional and operational aspects of disaster prevention and mitigation, preparedness and response and recovery and rehabilitation. The NDO is generally headed by the Prime Minister or Head of government in the respective country. (Baastel-ESL)

National Disaster Management Office (NDMO)

The NDMO is the government agency with focal responsibility for disaster management in the respective country. It is generally headed by the country's Disaster coordinator (Baastel-ESL)

Outcomes

Targets to be achieved in the Medium-term in the results-based framework. Outcomes result from an amalgam of short- term outputs (Baastel)

Outputs

Short-term Results from activities undertaken toward the medium-term outcome (Baastel)

Preparedness

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations (ISDR)

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and means to minimize related environmental, technological and biological disasters. Depending on social and technical feasibility and cost/ benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters. In the context of public awareness and education, related to disaster risk reduction changing attitudes and behaviour contribute to promoting a “culture of prevention”. (ISDR)

Recovery

Decisions and actions taken after a disaster with a view to restoring or improving the predisaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk. Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures (ISDR)

Relief / response

The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.

Resilience

The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures. (ISDR)

Results Based Management

“Rather than focusing programme/project management efforts on the monitoring of inputs, activities and processes, an RBM approach concentrates on ‘results’ and places emphasis on the following dimensions: **Defining realistic results** based on appropriate analysis and context; **Clearly identifying programme beneficiaries** and designing programmes/projects that meet their needs and priorities; Using results

information to **make effective management decisions; Monitoring the progress made towards expected results** with the use of appropriate indicators (Baastel)

Risk

The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

Conventionally risk is expressed by the notation Risk = Hazards x Vulnerability. Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability.

Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes. (ISDR)

Vulnerability

The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards (ISDR)

More: http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

Appendix 2

LIST OF ACRONYMS

ACCC	Adaptation to Climate Change in the Caribbean
BPoA	Barbados Programme of Action for the Sustainable Development of Small Island Developing States
BCPR	Bureau for Crisis Prevention and Recovery
B-Tool	Vulnerability Assessment Benchmarking Tool
CARDIN	Caribbean Disaster Information Centre
CARICOM	Caribbean Community
CARILEC	Caribbean Electric Utilities Services Corporation
CBO	Community Based Organisation
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosive Events
CC	Climate Change
CCA	Climate Change Adaptation
CCCC	Climate Change Coordinating Committee
CCCCC	(5C's) Caribbean Community Climate Change Centre
CCRIF	Caribbean Catastrophic Risk Insurance Scheme
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency (formerly CDERA)
CDERA	Caribbean Disaster and Emergency Response Agency
CDM	Comprehensive Disaster Management
CDMP	Caribbean Disaster Mitigation Project
CDO	Community Development Organisation
CDRT	Community Disaster Response Team
CEHI	Caribbean Environmental Health Institute
CIDA	Canadian International Development Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
CPACC	Caribbean Planning for Adaptation to Climate Change
CPC	Caribbean Programme Co-ordination Office (PAHO) in Barbados
CSME	CARICOM Single Market and Economy
CU	Coordinating Unit
CZMAC	Coastal Zone Management Advisory Committee

DaLA	Damage and Loss Assessment
DANA	Damage Assessment and Needs Analysis
DEMS	Digital Elevation Models
DIPECHO	Disaster Preparedness and Prevention Programme, ECHO
DMA	Disaster Management Act
DRM	Disaster Risk Management
DRR	Disaster risk Reduction
DRRC	Disaster Risk Reduction Centre
DVRP	Disaster Vulnerability Reduction Project
EC	Eastern Caribbean
ECHO	European Commission Department for Humanitarian Aid and Civil Protection
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
ENSO	El Niño Southern Oscillation
EOC	Emergency Operations Centre
ERDMP	Emergency Recovery & Disaster Management Project
FAO	Food and Agriculture Organisation of the United Nations
GAR	Global Assessment Report
GCC	Global Climate Change
GCM	Global Climate Model
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNP	Gross National Product
GIS	Geographic Information System
GOSL	Government of Saint Lucia
HFA	Hyogo Framework for Action
IADB	Inter American Development Bank
ICT	Information and Communication Technologies
IDP	Integrated Development Planning
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross
IR	Intermediate Result
ISDR	International Strategy for Disaster Reduction
ISPS	International Ship and Port Facility Security

IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
MACC	Mainstreaming Adaptation to Climate Change
MCE	Mass Crowd Events
MOU	Memorandum of Understanding
MSI	Mauritius Strategy for Implementation
MTDS	Medium Term Development Strategy
NBCC	National Biodiversity Coordinating Committee
NCCPAP	National Climate Change Policy and Adaptation Plan
NDC	National Disaster Coordinator
NDO	National Disaster Office
NDMO	National Disaster Management Office
NEC	National Environmental Commission
NEMS	National Environmental Management Strategy
NEMAC	National Emergency Management Advisory Committee
NEMO	National Emergency Management Organisation
NEOC	National Emergency Operations Centre
NEP	National Environmental Policy
NGO	Non-Governmental Organisation
NHMC	National Hazard Mitigation Council
NHMP	National Hazard Mitigation Policy
NLP	National Climate Change Policy and Adaptation Plan
NMS	National Meteorological Services
NOAA	National Oceanic and Atmospheric Agency (US)
OAS	Organisation of American States
OCHA	Office for the Coordination of Humanitarian Affairs (UN)
OECD	Organisation for Economic Co-operation and Development
OECS	Organisation of Eastern Caribbean States
PAHO	Pan-American Health Organisation
PEO	Public Education and Outreach
PMP	Project Monitoring Program
RBM	Results-Based Management
RCM	Regional Climate Model
RCS	Red Crescent Societies

RSO	Research and Systematic Observation
RSS	Regional Security System
SAR	Search and Rescue
SDMP	Second Disaster Management Project
SGD	St George's Declaration of Principles of Environmental Sustainability in the OECS
SIDs	Small Island Developing States
SLASPA	Saint Lucia Air and Sea Ports Authority
SLING	Saint Lucia Integrated National GeoNode
SLM	Sustainable Land Management
SLU CP-DRR	Saint Lucia Country Profile document for Disaster Risk Reduction
SLRC	Saint Lucia Red Cross
SNC	Second National Communication
SO	Strategic Objective
SPACC	Special Adaptation to Climate Change - Implementation of Pilot Adaptation Measures in Coastal Areas
SPCR	Strategic Plan for Climate Resilience
UN	United Nations
UNDP	United Nations Development Programme
UN-ECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention for Climate Change
UNISDR	United Nations Office for Disaster Risk Reduction
US	United States
USAID	United States Agency for International Development
UWI	University of the West Indies
V&A	Vulnerability and Adaptation
VCA	Vulnerability and Capacity Assessment
WB	World Bank
WCDR	World Conference on Disaster Reduction

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