

**STRATEGIC FRAMEWORK
FOR THE MINISTRY OF AGRICULTURE, LANDS
FORESTRY AND FISHERIES
- FOR DISASTER RISK REDUCTION
IN AGRICULTURE, FORESTRY AND FISHERIES**

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in Agriculture, Forestry, Fisheries



Ministry of Agriculture, Lands, Forestry and Fisheries
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ACRONYMS AND ABBREVIATIONS

CARICOM	The Caribbean Community
CCA	Climate Change Adaptation
CDEMA	Caribbean Disaster Emergency Response Agency
CDM	Comprehensive Disaster Management
CHAMP	Caribbean Hazard Mitigation Capacity Building Programme
DoA	Department of Agriculture
DoFi	Department of Fisheries
DoFo	Department of Forestry
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
FAO	Food and Agriculture Organisation of the United Nations
GIS	Geographical Information Systems
IPCC	Inter-governmental Panel for Climate Change
MALFF	Ministry of Agriculture, Land, Forestry and Fisheries
NEMAC	National Emergency Management Advisory Council
NEMO	National Emergency Management Organisation
NEMP	National Emergency Plan
NEOC	National Emergency Operations Centre
NGO	Non-Governmental Organisation
NHMC	National Hazard Mitigation Council
OECS	Organisation of Eastern Caribbean States
SIDS	Small Island Developing States
SLR	Sea Level Rise
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
UWI	University of the West Indies
WRMA	Water Resources Management Agency

1. INTRODUCTION

1.1 Background

Saint Lucia is one of the islands called the Lesser Antilles situated in the Eastern Caribbean. With an area of 616 km² (238 sq miles), and a coastline of 158 km (98 miles). The climate is tropical with a dry season from January to May and the wet season is from June to December.

Saint Lucia is vulnerable to many natural hazards, including hurricanes and coastal storms, floods, drought, earthquakes and volcanoes. The island is also highly vulnerable to the impacts of climate change. Rising sea levels, together with the associated coastal erosion and salt water intrusion, an escalation in the frequency and intensity of tropical storms and hurricanes, and disruptions in rainfall and fresh-water supply threatens to hinder progress in sustainable development. While the island has taken action over the years to reduce and mitigate natural hazards, much remains to be done.

1.2 Brief profile of agriculture sectors

Agriculture, forestry and fisheries continue to play a significant role for Saint Lucia in earning foreign exchange, generating employment, and contributing towards economic growth and food security. However, agriculture's contribution to GDP has dropped from above 10% to 3 to 5% when the new EU Banana regime was introduced about 15 years ago and led to a sharp drop in banana production (see Figure 1). While the banana industry still plays an important role in the sector, the government is fostering a diversification of crops and the strengthening of the livestock, fishing and forestry sub-sectors. The transition to a tourism and services based economy leads to a resource transfer from agriculture and rural households to these emerging sectors.

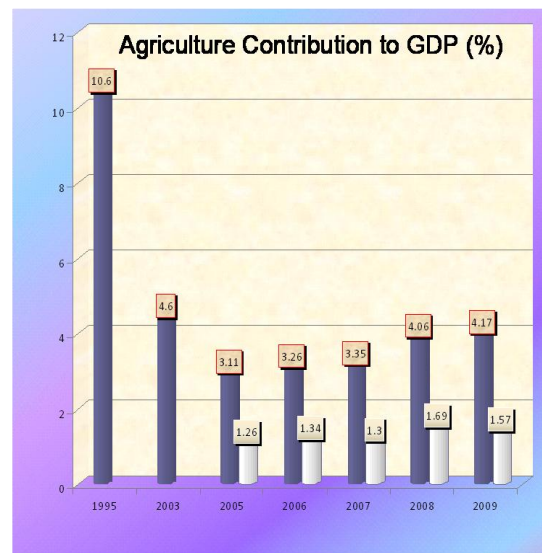


Figure 1 Change in Contribution of Agriculture to National GDP (%)

The agricultural census from 2007 recorded about 10,000 holdings with an average size of 3.2 acres. Thus, family owned, small holdings continue to dominate the agricultural landscape. More than 70% of the farms operating more than 100 acres in 1996 had disappeared in 2007. The decline in banana production also produced a severe change in type of machinery and equipment used. The decline of the fraction of population living in farm holding households from 47% to 37% and 21%, in 1986, 1996 and 2007, respectively shows the urbanisation. The significant decrease in land with pastures signals the need to intensify the production of grasses and leguminous plants on small farms for cut-and-carry production systems or for the intensive production of fodder for sale to ruminant producers. Decreases in the numbers of sheep and goat were compensated with a very significant increase in the numbers of pigs and poultry. Fishery has undergone increased commercialisation in the past 15 years. In 2006, the fleet consisted of 6901 vessels operated by 2319 fishermen, of whom 40 percent operate on a part-time basis. Traditional wooden craft (canoes) are more and more replaced by larger, more stable open craft (i.e. fibreglass pirogues) and, to a lesser extent, small longliners with inboard engines and using mechanized gear. Another recent change is that more fishers are investing in their own vessels, rather than working as crew. Over 65% of annual fish landings at 17 coastal communities comprise offshore migratory pelagics (e.g. dolphin fish, tuna), captured mainly between December and June. There are no inland fisheries of commercial importance. Aquaculture development, mainly shrimp, tilapia and seaweed has been an important focus of

government. Fish consumption has increased considerably, due to expansion of the tourism sector and increased local demand for fish.

The agricultural sectors have been growing in the last few years. However, significant growth in the agricultural sector is hampered by a number of internal problems, namely high costs of inputs, limited access to financing, limited use of improved technologies, weak production planning, insufficiently organized structures and systems, an aging farming population and limited availability of farm labour. In addition, the sector is heavily affected by regional and international markets and the impact of natural disasters and climate change.

1.3 Hazards, Risks and Disasters affecting agriculture forestry fisheries and Food and Nutrition Security in Saint Lucia

Agricultural sectors in Saint Lucia are exposed to a wide range of hazards and threats. These include:

Hydro-Meteorological Hazards:	Hurricanes, Tropical Depression, Strong Wind and, Storm Surge, Sea Waves Drought and Heat Wave, Flooding, Landslides, Siltation, Wild Fires
Biological Hazards:	Plagues, Pests and Diseases, Epidemics
Geological Hazards:	Volcanic Eruption, Earthquake, Tsunami,
Technological Hazards:	Fire, Explosion, Hazardous Material Spill, Poisoning, Pollution, Dam Failure
Other	Praedial larceny

Most of the hazards are rapid onset whereas droughts and plagues are slow on-setting. The most frequent hazards in Saint Lucia are hurricanes, storms and flooding. Natural disasters significantly affect the economy. For example, Hurricane Allen caused damages of EC\$250 million, Tropical Storm Debbie in 1994-EC\$230 million, a Tropical Wave in 1996 - EC\$12 million, the Tropical Storm Lili in 2002 - EC\$20 million, Hurricane Ivan in 2005 - EC\$7 million (excl. banana industry) and Tomas in 2010 - EC\$907.62 million). The island experienced strong earthquakes in 1909, 1953 and 1996 and 2007.

1.4 Impacts of natural hazards and climate change on agriculture, forestry, fisheries and water resources

Agriculture, forestry and fisheries are regularly affected by natural disasters, in particular storms, hurricanes, floods and droughts. For example, Hurricane Dean in 2007 led to a estimated damage of 22.7 Mio EC \$ on agriculture, distributed as follows across the sub-sectors: Bananas 80% + other crops 6%, Livestock 4%, Fisheries 2%, Forestry 4% and on-farm infrastructure (mostly irrigation and drainage) 4%. An extensive dry spell in the year 2009/10 led to losses in production of vegetables, root and tree crops as a result of inadequate irrigation coupled with excessive heat. Figures available indicate that for non-banana agriculture, 152.18 hectares were affected by the drought, with an estimated loss of EC\$3,521,167 with EC\$1,294,960 required for inputs for rehabilitation. Livestock was also severely affected through heat stress and the reduced availability of livestock fodder. The drought triggered an increase in the occurrence of wildfires.

Hurricane Tomas in 2010 caused significant damage to the agricultural sector. The total damage to the sector was estimated at EC \$151.75 million, of which damage was estimated at EC \$108.82 million and losses at EC \$42.93 million. Of the total damage, the forestry sub-sector accounted for 37.0%, while total damage to the banana sub-sector was 36.0%. Significant damages were also incurred by the agricultural

infrastructure (17.4%) and 'other crops' subsector (8.0%). Damage to the livestock sub-sector was estimated at 0.7% and fisheries at 1.0%.

Saint Lucia is highly vulnerable to climate change impacts due to (i) its fragile and dependent economy, (ii) its geographic location within the hurricane belt and its small size; (iii) the location of major settlements and infrastructure in low-lying coastal areas prone to flooding and storm damage; and its limited human and financial resources. It is recognized that climate change may seriously impact agricultural production and food security in the country. The National Climate Change policy and Adaptation plan outlines the following main risks to agriculture:

- Increased water demand and reduced supply due to higher temperature and more frequent drought;
- Increased occurrence of agricultural pests due to increased temperatures;
- Reduced crop and livestock production due to modified agro-climatic regimes;
- Accelerated soil erosion due to more frequent and severe flooding
- Sea level rise leading to land and infrastructure loss, beach erosion, storm surge, floods and inundation of low-lying areas;
- Damages from more frequent and severe hurricanes due to higher ocean temperature

Annex 6 provides an overview how the different climate change phenomena affect agriculture, forestry and fisheries, water resources and coastal zones.

1.5 Scope of the Strategic framework for DRR in Agriculture Forestry and Fisheries

Disaster Risk Reduction is an integral aspect of St Lucia's comprehensive approach to DRM. MALFF is committed to the formulation of an integrated plan for comprehensive DRM, including distinct but related sections on (i) DRR, and (ii) emergency response and rehabilitation as related to the agriculture forestry and fisheries sectors.

This document serves as a framework for the systematic and strategic coordination of MALFFs interventions in DRR in the agricultural sectors. It is intended to become an integral part of MALFF's comprehensive plan for DRM. Given MALFFs financial and technical resource limitations it prioritizes interventions, indicates key areas for future action for a five years period (2012-2016) and proposes time lines for addressing. Part of the identified actions were pilot tested under current projects (such as the MALFF/FAO TCP Project on disaster risk mitigation), however, substantial additional financial resources will be required for the wider outreach and the full implementation of the strategic framework.

The new Strategic Framework for DRR in agriculture builds on the disaster management vision of the Government of Saint Lucia reflecting the paradigm shift in disaster management from conventional response and relief practice to more comprehensive disaster management. It thus complements the existing cross-sectoral policies and plans related to hazard mitigation and preparedness.

The strategy also considers linkages to climate change policies and plans and aims to seek synergies between interventions related to disaster risk reduction and climate change adaptation. The rationale for this is that in the short term climate change impacts are likely to be mainly felt through more frequent and intense hydro-meteorological hazards and that many DRR and CCA measures in the agricultural sectors are identical. However, this strategic framework does not aim to explore all interventions that would be needed to holistically address climate change adaptation in the sector.

2. POLICIES, REGULATIONS AND IMPLEMENTATION FRAMEWORK FOR DISASTER RISK MANAGEMENT IN SAINT LUCIA

2.1 International and regional frameworks with relevance for DRR

International agreements and conventions: : Saint Lucia signed the Millennium Declaration and has made significant progress in the achievement of the Millennium Development Goals. The objectives of the declaration refer to disasters through (1) Protecting the most vulnerable to the consequences of natural disasters, and (2) Protecting our common environment to reduce the number and effects of natural and man-made disasters. Saint Lucia signed the three Rio conventions for climate change (UNFCCC), combating land degradation (UNCCD) and biodiversity (CBD) and is dedicated to implement the Hyogo Framework for Action (HFA), 2005-2015, which was adopted at the World Conference on Disaster Reduction in 2005 as a framework to address disaster risk reduction (DRR) in a proactive manner.

As a signatory of the **St George's Declaration of Principles for Environmental Sustainability in the OECS**, Saint Lucia commits to establish integrated and comprehensive disaster management frameworks at the community, national and regional levels and to exchange information on lessons learnt regarding the causes and impacts of natural and man-made hazards and to enact laws, create organizations and institutions and provide money to assist people and communities to adapt to the impact of climate change. Likewise, in the new OECS Economic Union Treaty all member states commit to strengthen community level capacities to reduce disaster risks.

Comprehensive Disaster Management Framework for the Caribbean, 2007-2012: The purpose of the CDM framework is to strengthen regional, national and community level capacity for mitigation, management and coordinated response to natural and technological hazards, and the effects of climate change. The enhanced framework responds to the growing interest in DRR. In view of Results Based Management four priority outcomes and associated outputs were defined for a five year period (see Annex 4). To reflect the shift from response to comprehensive management the Caribbean Disaster Emergency Response Agency (CDERA) was renamed in 2009 to **Caribbean Disaster Emergency Management Agency (CDEMA)**. In the CDM context, the Caribbean Community (CARICOM) is exploring options for broadening existing crop insurance schemes such as the WINCROP Scheme for Banana farmers to other crops, or index based insurance systems.

Climate Change Framework for the Caribbean, 2009-2015 : The climate change framework comprises four key strategies to increase the resilience of the CARICOM economies, namely related to (1) Mainstreaming CCA into sustainable development, (2) Energy related mitigation actions, (3) Actions to reduce the vulnerability of natural and human systems to climate change impacts and (4) The promotion of sustainable forest management (see Annex 5). **The Caribbean Community Climate Change Centre (CCCCC)** coordinates the implementation of the framework. With regard to disaster risk reduction, the framework envisages that the financing of DRR initiatives will be treated as a development priority within the budgeting process, and that all government entities will ensure that DRR is mainstreamed into development programmes and projects. CARICOM governments will explore the feasibility of establishing a Natural Hazard Risk Management Fund to finance prospective disaster risk management initiatives. The framework also recognizes the critical role of regional organizations in information sharing and capacity building for climate hazard risk management. The CCCCC was opened in 2005 to coordinate the region's response to managing and adapting to climate change. It is the official repository and clearing house for regional climate change data and provides climate change-related policy advice and guidelines to the CARICOM Member States.

2.2 Reference to Disaster Risk Reduction in National Development Plans

There is no single overarching document to guide overall national development in Saint Lucia. However, a five-year national development plan is under development. The current key social policy document is the Interim Poverty Reduction Strategy and Action Plan.

Interim Poverty Reduction Strategy and Action Plan for Saint Lucia, 2003: The objectives of Saint Lucia's strategy to reduce poverty refer to (1) the provision of sustainable economic opportunities, (2) the empowerment of people and communities, and (3) the promotion of access to basic services and the protection of vulnerable individuals and groups. The plan recognizes that natural disasters add to the uncertainty and vulnerability of many livelihood strategies, especially those of the poor. It also states that the environmental root factors of poverty are likely to be exacerbated by climate change. The following objectives relate to DRR and/or agriculture: (i) Support agricultural production, diversification and competitiveness, (ii) Maintain and enhance the productivity of natural systems (iii) Facilitate access to land for agricultural production, (iv) Strengthen social capital, (v) Provide social protection and effective safety nets, (vi) Sustain and expand programmes and projects, and provide facilities that benefit the poor and vulnerable, e.g. in water supply, environmental quality and disaster management.

2.3 National Disaster Risk Management Planning and Implementation Framework

Saint Lucia has a well articulated disaster risk management framework. The National Emergency Management Plan (NEMP) includes plans for nearly all hazards and for some sectors (health sector, hospitality industry). Although these plans often focus on preparedness and response activities, in most cases they also include mitigation activities and building back better principles in recovery and rehabilitation. Public service announcement to raise awareness on disaster risks are produced, e.g. by MALFF, CDEMA and the Government Information Service, are carried by all media houses. NEMO is committed to implement comprehensive disaster management (CDM) and thus to boost prevention and mitigation activities on the ground. However, there is no dedicated government budget for disaster risk mitigation and most DRR related projects heavily depend on donor support.

2.3.1 Legislation and policy documents

The Disaster Management Act 2006 Act No. 30 of 2006 replaced the Disaster Preparedness and Response Act # 13 of 2000. It clarifies and allocates responsibilities within government for disaster management and provides for a more effective organization of mitigation, preparedness, response, and recovery activities. Though passed in 2006 the Act requires a revision to incorporate Comprehensive Disaster Management, Climate Change, Mass Crowd Events and the articles of incorporation of CDEMA.

St.Lucia's Comprehensive Disaster Management Strategy and Programming Framework for 2011-2016 which highlights with regard to hazard mitigation the following priority needs.:

- The need to educate building professionals on integration of CDM into planning and development;
- The need to enforce CDM-related planning legislation;
- The need to further integrate hazard vulnerability assessments into planning and development;
- The need for integration of CDM planning in private sector and education sector;
- The need for additional hazard scientific data

Key policies and plans specifically related to DRR are the National Hazard Mitigation Policy and the National Hazard Mitigation Plan.

The National Hazard Mitigation Policy: The policy aims to integrate hazard risk reduction measures at all levels into society. Specific policy objectives are:

- To encourage the incorporation of hazard mitigation measures in all public and private sector development planning initiatives and programme budgets,
- To foster a collaborative approach to hazard risk reduction among all stakeholder groups,
- To empower local community groups, institutions and individuals to undertake hazard mitigation measures,
- To increase the awareness of hazard mitigation at every level of society and encourage their involvement in hazard risk reduction,
- To develop an effective and comprehensive legislative and institutional framework that supports hazard mitigation.

To achieve this, it outlines seven broad priority areas of action and associated strategic interventions (see Annex 6).

The Hazard Mitigation Plan defines the organisational and functional, mechanisms and procedures for carrying out a mitigation programme. A **Hazard Mitigation Plan of Action is under development** as a guide to the implementation of the Hazard Mitigation Plan and the Hazard Mitigation Policy, thereby creating actual mitigation practices throughout Saint Lucia, as well as to stimulate the government, communities and individuals to use current hazard mitigation programmes and to implement new strategies, projects and programmes within their communities. The draft plan outlines the following key objectives (subject to further consultations):

- Mitigation strategies or measures should always be considered in the rebuilding process,
- Strengthen infrastructure and facilities to more effectively withstand the next disaster,
- Ensure that communities address natural hazards that pose a risk and take steps to avoid these hazards altogether or incrementally reduce the community's exposure to its hazards,
- Empower communities to take on mitigation projects through community and individual grant mitigation programmes,
- Enforce current legislations and pass awaiting legislation,
- Implement new hazard mitigation programmes and write more strategic policies and projects.

The existing policy framework has already initiated a number of **hazard specific action plans**. Those which are of particular relevance also for disaster prevention and mitigation in agriculture (DRR context) include

- the building code,
- the fire management plan,
- the flood management plan and the
- water management plan for drought conditions.

2.3.2 National Coordination Framework for Disaster Risk Management and Risk Reduction

National Emergency Management Organisation (NEMO): NEMO is mandated to have the Nation in a state of preparedness in case of an emergency, as well as to co-ordinate the response to the impact of any level. In support of DRM, it coordinates the development of the National Emergency Management Plan (NEMP), conducts education and awareness activities, documents disaster impacts. NEMO also coordinates and catalyzes through one of its sub-committees, the NHMC, (see below) the process of increasing mitigation activities at national and district levels and throughout all sectors concerned. NEMO has developed and coordinates a Tsunami Contingency Plan.

The National Disaster Management System of Saint Lucia consists of three tiers: (1) the **National Emergency Management Advisory Committee (NEMAC)**, (2) **12 National and 18 District Disaster Committees** and (3) the NEMO Secretariat as the supporting and coordinating unit (Figure 2). In the case

of a response to an emergency or a disaster, the NEMO secretariat is responsible to co-ordinate the response of all Committees, through the **National Emergency Operations Centre (NEOC)**. The Cabinet Secretary or the Director (NEMO) can advise CDEMA coordination, based upon established response levels. Once activated, the CDEMA Coordinating Unit will coordinate regional response, request additional resources and ensure adequate support to all relevant national functions.

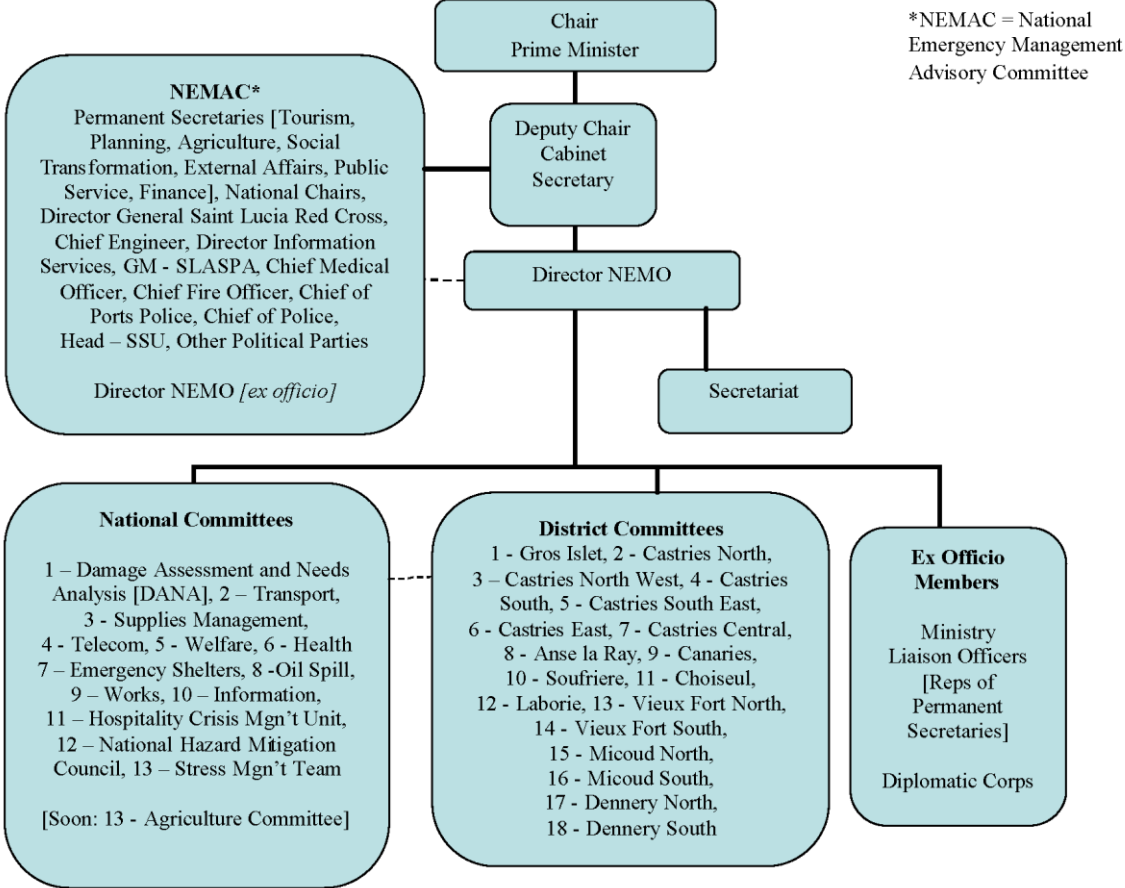


Figure 2 Schematic overview of national disaster framework

Each national committee is formed with a series of sub-committees and each District Committee is represented on the National Committees. MALFF is a member of the Damage Assessment and Needs Analysis Committee as well as of the National Hazard Mitigation Council. A national committee specifically for Agriculture under NEMO is envisioned but has not yet been established; it is envisaged to create it building on (a) MALFF’s already existing Agriculture Management Committee (which coordinates currently emergency response in agriculture) by enhancing its mandate and TORs, and (ii) linking it to the Agricultural Pest and Disease Committee.

The **National Hazard Mitigation Council (NHMC)** which is one of the national NEMO committees, has the lead role in the coordination of DRR activities. The recommended composition of the NHMC includes: Representatives from seven ministries, the chamber of commerce and industry, the insurance council, the Saint Lucia Red Cross and the Chairs of the NEMO committee on emergency works, the national climate change committee, the Agriculture, Environment and Natural Resources Committee of the National Council for Science and Technology for Development and the chairs of all technical working groups (see Figure 3). The objectives of the NHMC are to:

- Coordinate government programs for vulnerability reduction
- Foster scientific and engineering endeavours aimed at closing gaps in knowledge in order to reduce loss of life and property

- Develop measures for the assessment, prediction, prevention and mitigation of natural disasters through programs of technical assistance and technology transfer, demonstration projects and education and training, tailored to specific hazards and locations and to evaluate the effectiveness of those programs.
- Prepare a National Mitigation Plan for Saint Lucia
- Approve Community Hazard Mitigation Plans.

The Terms of References of the NHMC include detailed descriptions of the memberships, tasks and reporting arrangements for each of the groups. There is one dedicated group for the Risk Benchmarking Tool (BTool).



Figure 3 Committees and technical working groups linked with the National Hazard Mitigation Council

Most **district committees** meet once a month, but in most cases only during the Hurricane Season. The degree of engagement of the district committees in DRM activities varies, some of them are facing difficulties in recruiting volunteers. Their activities include for example:

- Educate residents on disaster preparedness issues through meetings, flyer distribution, local radio, school and church events, drills and simulation exercises
- Ensure proper warehouse and shelter management
- Regular hazard mapping and analysis through village meetings and/or village tours
- Engage residents in activities that reduce their vulnerability (e.g. tree trimming, drain cleaning, river de-siltation) and request government support, if needed
- Trainings for committee members and associated volunteer groups
- Disseminate early warning messages (e.g. hurricane, drought)
- After a disaster, to prepare immediate needs assessments and providing relief
- Update district disaster plan at least once a year

2.4 Summary: National Framework for Disaster Risk Management and Disaster Risk Reduction

Saint Lucia has rich and articulated legal and policy frameworks for disaster risk management and climate change. The challenge lies in the enforcement of the existing legislations, the implementation of the various policies and plans, the mainstreaming of DRR across all sectors and the active engagement of communities. Saint Lucia has made important efforts to reduce disaster risks, in particular through awareness raising and the adoption of structural measures. Further up-scaling of activities to reduce the vulnerabilities at community level, such as flood prevention, landslide mitigation, drought mitigation etc., will require further strengthening of human and institutional capacities, expanding public education and outreach, seeking of financial resources and developing appropriate information and communications systems. The finalization of a comprehensive land use plan, including a land use zoning and the establishment of a national fund for community level mitigation programmes would be other key elements.

The Risk Benchmarking Tool Assessment in 2006 positioned Saint Lucia with an overall performance of 51% of the disaster risk management system as number 3 among the six included OECS countries, close after St Kitts and Nevis and St. Vincent and the Grenadines. The country reached the first rank in the region for risk identification and disaster preparedness. Particularly low scores were reached for risk transfer and rehabilitation and reconstruction. In addition, the adequacy of various aspects of DRM was assessed (see Table 1).

Table 1 Assessment of the adequacy of Disaster Risk Management in Saint Lucia
(Compiled from BTool Country Assessment Report, 2006)

Aspects of DRM	Strength	Weakness
Policy	disaster preparedness	risk identification policies
Legislation	risk identification, risk mitigation legislation	risk transfer legislation
Standards and regulations	emergency response management	DRM standards and regulations
Assignment of responsibilities	emergency response, disaster preparedness	risk mitigation, rehabilitation and reconstruction
Technical tasks	disaster preparedness	emergency response
Technical content	disaster preparedness	rehabilitation and reconstruction, risk transfer
Public awareness	risk mitigation, rehabilitation and reconstruction	
Stakeholder participation	disaster preparedness, emergency response and rehabilitation and reconstruction	risk identification, risk transfer
Funding	disaster preparedness	risk transfer, emergency response
Human Capacity	all others	risk transfer
Information Management		emergency response

2.5 National Climate Change Framework

St. Lucia's National Communication on Climate Change: The first communication to UNFCCC on climate change was submitted in 2001. The second communication is under finalization but has however not yet been formally submitted to UNFCCC. Disaster Risk Reduction related to climate induced hazards is a key pillar of climate change adaptation planning in St Lucia. Significant progress with regards to hazard mapping and the understanding of local climate change impacts has been made in the last 10 years. The first national communication lists impacts by sector and identifies adaptation measures. For the second national communication detailed vulnerability and adaptation assessments were conducted for all sectors to determine the level of current and future vulnerability of sectors, regions and population groups to climate change as a result of exposure and sensitivity to impacts. However, in depth assessments have been limited by the paucity of data. There is a need to enhance environmental monitoring systems and to increase national capacities of using Geographic Information systems for assessments.

2.5.1 Climate Change Policies and Strategies - Reference to Agriculture

National Climate Change Policy and Adaptation Plan, 2003: The climate change policy and adaptation plan outlines the following key strategies for agriculture:

- Develop a sound basis for decision-making, by enhancing research in possible climate change impacts on crop productivity and food security (special focus on export crops, such as banana and cocoa), water availability for agriculture (especially irrigation), soil productivity and management (salinisation, erosion) and pest-crop interactions;
- Develop a national adaptation strategy/policy for the agricultural sector and incorporate it into the national physical and spatial planning process;
- The adoption of appropriate adaptation measures in line with long-term, sustainable strategies for the agricultural sector and food security (e.g. soil conservation measures, construction of water storage and irrigation facilities for crop production).

The **National Adaptation Strategy** spells out the following priority action areas for agriculture, forestry and fisheries sub-sectors including fresh water resources:

- Establish a system for improved monitoring and research of relevant agricultural processes and terrestrial observation to determine the effects of climate change.
- Develop a climate change strategy for agriculture to respond to likely impacts on the sector.
- Establish conservation and protected areas and restore degraded ecosystems
- Develop and implement a National Water Resources Management Plan.
- Undertake an inventory of water resources
- Promote strengthening of National Water Resource Agencies
- Development and implementation of integrated public education and awareness programmes on impacts of climate change.

2.5.2 Coordination Framework for Climate Change and the role of agriculture

The national climate change activities are coordinated by the Sustainable Development and Environment Section (SDE) of the Ministry of Planning, Development, Environment and Housing. Another agency with key responsibility in the area of climate change is the Meteorological Department in the Ministry of Works, which is responsible for the collection and analysis of meteorological data. In addition, the National Climate Change Committee, a multi-sectoral steering committee comprising various public and private sector agencies including NEMO, provides technical input on climate change to SDE.

Within the Ministry of Agriculture, Lands, Forestry and Fisheries (MALFF) focal points from each department plus the national biodiversity focal point are members to the climate change committee. The committee meets about three to four times a year. In the context of the national strategy for adaptation MALFF is listed as an involved agency in ongoing actions related to improved land management (plan development), management of coastal and marine resources (monitoring & data collection, research-policy interface) and harmonization of systematic observation activities

The Study ‘Assessment of the economic impact of climate change on the agricultural sector in Saint Lucia’ (Oct 2011) conducted by the Economic Commission for Latin America and the Caribbean (ECLAC) highlights agriculture as one of the sectors severely impacted by climate change. The study suggests a range of prioritized adaptation practices, which reinforce the link between sustainable agricultural development, disaster risk reduction and adaptation. MALFF with the assistance of the FAO Disaster Mitigation project (TCP) has already addressed 8 of the 10 priority adaptation options recommended by the ECLAC report, including through pilot testing on farmers fields.

MALFF is ready and prepared to institutionalize and lead the implementation of an integrated approach to DRR and CCA within agriculture forestry and fisheries, and to act as key partner in the national efforts to address climate change and disaster risk reduction.

3. INSTITUTIONAL SET UP FOR DISASTER RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN AGRICULTURE, FORESTRY AND FISHERIES

3.1 Regional and National Agricultural Policies with relevance for DRR

Ten year Agricultural Policy and Strategic Plan for the OECS, 2003: The agricultural policy for the sub-region calls for diversification, intensified agro-industrial development and agri-business, deepened institutional reform and generally, agricultural production on a competitive market-oriented, internationally integrated and environmentally sustainable sound basis. The document outlines four broad strategic areas for the next 10 years, namely: (1) Policy, Legal and Institutional Reform, (2) Natural Resources Management, (3) Financial Options, Incentive Regimes and Insurance, (4) Production, Product Development and Marketing. Reference to climate change is made in strategic areas 2 and 4. Action area 3 focuses mainly on enhancing risk mitigation measures, such as the exploration of a sub-regional insurance facility specially tailored to the need to reduce risks for commercial agriculture that covers a range of crops. The need for education and training in disaster vulnerability and disaster prevention is also mentioned. Action area 2 does not explicitly refer to DRR but is highly relevant through its focus on improved agricultural land and water use management, including water related assessments, water allocation schemes and the need for the establishment of water information systems to augment the Land Resource Information System including impacts of climate change on agricultural production systems.

National Agricultural Policy 2009-2015: The agricultural development of Saint Lucia is guided by the Agricultural Policy developed by the MALFF for the period 2009 to 2015. The vision statement for the sector, including for livestock, fisheries and water resource management is: “A vibrant agri-food chain or system that provides adequate supplies of safe, high quality, nutritious food and non-food products and services, at stable and affordable prices, that assure financial security to producers and is socially and environmentally responsibly thereby, promoting development in rural areas and conservation of resources”. Specifically, the policy aims to: (1) increase the efficiency and competitiveness of the sector, (2) promote improved technology generation, adaptation and adoption, (3) expand agricultural production and market base, (4) rationalize the use of land, (5) enhance national food security, (6) generate employment and income opportunities in rural areas and (7) protect, conserve and ensure sustainable use of natural resources.

The policy recognizes the impact of natural phenomena, such as, hurricane, drought, invasive species and climate change on agricultural production cycles as largely as external factors. However, the first objective to increase the efficiency and competitiveness of the sector includes as one core strategy to assist the farming community to mitigate and manage risks. Examples for suitable measures are given, including: (a) affording access to land, (b) promoting soil conservation practices, (c) promoting sustainable management of natural resources within river basin (d) better planned, long term risk prevention and preparedness strategies, (e) integrated pest management, (f) precautionary fisheries measures such as installation/improvement of storm warning systems, training in safety precautions, contingency planning for pollution, (g) access to adequate quantities of good quality seeds and planting material and farming systems (h) crop insurance, (i) farm safety nets and (j) encourage active risk avoidance, management and identification and evaluation of best alternatives. Under objective 6 the need to adopt hazard analysis is expressed, in the context of food safety.

National Forest Policy: The National Forest Policy, which is still awaiting official endorsement of the cabinet, provides the framework to conserve and manage the forest resources of Saint Lucia for protection of water, wildlife and soil resources and to sustain the forests' contribution to national socio-economic development and the livelihood of rural stakeholders. A National Forest Management and Conservation Plan and local forest management plans will be developed to implement the policy.

The specific policy objectives refer to: (i) Conserve and enhance the quality and productivity of the forest resources for ensuring a sustained flow of goods and services; (ii) Encourage and foster the participation of stakeholders in planning and decision making, (iii) Educate and maintain public consciousness regarding the functions of and benefits of forests and wildlife conservation, (iv) Conduct research and investigation on biodiversity and ecosystem services, and (v) Establish and maintain effective institutional arrangements and innovative financial structures for efficient implementation. The document refers to hazard mitigation, with particular emphasis on minimizing and mitigating the impacts of invasive alien species and climate change on the country's natural resources. It also stresses the importance of community-based watershed management.

Other key sectoral policies and plans relevant to DRR and CC in the agricultural sectors: There are various other plans and policies that are highly relevant for disaster risk reduction and in which MALFF is engaged. These include:

- the fisheries management plan
- the coastal zone management plan
- the national water policy, which covers issues of access to water and sanitation
- the sustainable forest management plan, the national environmental policy and the national environmental management strategy
- the national action plan to combat desertification/land degradation (draft)
- the national land policy
- the national comprehensive land use plan (under development)
- the national building code
- the national avian influenza plan
- the national biodiversity plan
- the Bio-safety plan
- food safety (in progress)

Many of these plans and policies require additional resources for finalization and/or proper implementation.

No comprehensive disaster management plan and/or climate change adaptation plan exists so far for the agricultural sectors. However, several hazard-specific disaster plans exist, in which MALFF plays a key role, many of them still have to be finalized.

- Wildfire Management Plan

- Emergency Action Plan For Agricultural Pests And Diseases in Saint Lucia (draft)
- Management Plan of Black Sigatoka disease (draft)
- Avian Influenza Plan
- Evacuation Procedures: Volume 4: Animal Evacuation and Recovery (draft)
- Business Continuity Disaster Plans for MALFF, separate by department due to different location of buildings (drafts)
- Field Operations Guide while in the Forests of Saint Lucia (draft)

3.2 Capacities for enhanced DRR in agriculture, forestry and fisheries

A detailed analysis of the MALFF and its departments in view of its current roles in DRR and its capacities to implement a strategy for enhanced DRR in agriculture was conducted to inform the design of this Strategic Framework for DRR in agriculture. The study included a detailed strength, weakness, opportunities, and threats analysis (SWOT) of MALFF in view of its future role in DRR and climate change CC . The summary of findings of this background study are provided as Annex 1..

The current roles and responsibilities of other agencies and key partners of MALFF with regard to DRR and essential for the implementation of an enhanced DRR strategy in agriculture were also looked into (also Annex 1), including the Caribbean Agricultural Research and Development Institute in Saint Lucia , the office of the Inter-American Institute for Cooperation on Agriculture (IICA) in Saint Lucia, the Organisation of Eastern Caribbean States (OECS) ,the Disaster Risk Reduction Centre (DRRC) at the University of West Indies (UWI), the Caribbean Environmental Health Institute (CEHI); other governmental agencies, such as the Sustainable Development and Environment Section (Ministry Physical Planning, Environment, Housing) ; the Physical Planning and Survey Sections (Ministry Physical Planning, Environment, Housing) , and the Meteorological Services (Ministry of Communications, Works, Transport & Public Utilities); and some actors from private sector and civil society.

The results show significant strengths of MALFF to build on, including particularly its technical capacities and reach out to local levels as well as existing partnerships with and sharing of tasks with other key stakeholders for DRR in agriculture; the analysis calls for MALFF's stronger engagement as key institution for DRR and CCA regarding agriculture sectors issues. Results confirm also that all MALFF departments are already engaged in some activities that are highly relevant for DRR and CCA. However, a systematic approach to specifically address and systematize DRR issues in the agricultural sectors is lacking This Strategic Framework will provide the context for a systematic approach to DRR in agriculture, in view also of climate change, building on existing strengths and capacities and partnerships while addressing current gaps and weaknesses.

4. THE STRATEGIC FRAMEWORK TO STRENGTHEN DRR CAPACITIES IN AGRICULTURE, FORESTRY AND FISHERIES

This Strategic Framework aims to strengthen the role of the MALFF as a partner in disaster risk reduction and suggests priority actions and entry points for DRR interventions in the agricultural sectors. It was developed through an interactive consultation process with a variety of key DRR stakeholders within and outside the Ministry.

The structure provided by the Strategic Framework is closely linked to the Hyogo Framework for Action (HFA) 2005-2015 (see Annex 3), which was adopted at the World Conference on Disaster Reduction in 2005 in Kobe, Japan as a framework document to address DRR in a proactive manner. The HFA defines five priority areas for action:

- Ensure that DRR is a national and a local priority with a strong institutional basis for implementation;
- Identify, assesses and monitor disaster risks and enhance early warning;
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- Reduces the underlying risk factors;
- Strengthen disaster preparedness for effective response at all levels.

The Comprehensive Disaster Risk Management Framework for the Caribbean (CDM, see Annex 4), which provides a regional umbrella for DRM in the Caribbean, also builds on these same five priority areas for action. The structure of this Strategic Framework for DRR in agriculture for St. Lucia is thus well in line with the overarching frameworks for DRR at international and regional levels. It applies however some small modifications to the five priority action areas (as they were defined in HFA) in order to make them fit to the specific needs and perspectives from the agricultural sectors.

4.1 Objectives and purpose of Strategic Framework for enhanced DRR in agriculture, forestry and fisheries

The objective of the plan is to enhance knowledge, abilities and capacities at all levels for disaster prevention, mitigation and preparedness within agriculture, forestry and fisheries in Saint Lucia.

The Strategic Framework for enhanced DRR in Agriculture in Saint Lucia will be used to:

- strengthen disaster prevention, mitigation and preparedness within agriculture, forestry and fisheries,
- articulate and integrate MALFFs contribution to the comprehensive national DRM strategy in Saint Lucia, linked to national climate change policies and strategies,
- provide MALFF with a framework to strengthen skills and increase capacities to effectively provide DRR and CCA related know how and services to farmers;
- contribute to better coordination between key stakeholders in DRR and CCA at national, regional and local level;

4.2 Guiding principles for the development and implementation of the Strategic framework

The Strategic Framework is guided by the following key principles which are in line with the guiding principles of the National Hazard Mitigation Policy, the National Climate Change Policy and National Agricultural Policies. These include to;

- Integrate DRR and CCA in sustainable development planning
- Use a results based approach for coordinated participation of all stakeholders including governmental, nongovernmental and community-based organizations, partnerships and integration
- Promote public awareness and capacity building for disaster monitoring, early warning, disaster prevention and preparedness and climate change research and planning
- Make available hazard information and data for risk assessment
- Recognize DRR as an investment in sustainable development
- Consider environmental and economic resilience as key to DRR and CCA
- Build on existing experience and capacities and strengthen them in respect of DRR
- Ensure that DRR and CCA activities are in line with conventions and protocols to which St. Lucia is a signatory. Use a collaborative approach at the at the departmental and and sector levels to reduce the effects of disasters and integrate diversified means to develop a sound system for comprehensive DRM and an effective operational mechanism
- Define agricultural communities as the ultimate beneficiaries of MALFFs involvement and contribution to DRR

4.3 Main Result Areas and Entry Points for interventions of MALFF in DRR

Under the five Main Result Areas, which correspond to the pillars of the Hyogo Framework for Action, the following key strategies and actions were identified. The specific actions including lead responsibilities and envisioned timeframe are outlined in the subsequent pages.

- Efficient institutional set-up for DRM in MALFF
- Institutionalizing DRM and CCA within MALFF
- Strengthen complementary collaboration with other key actors in DRM
- Enhanced application of climate information and early warning systems in the agricultural sectors
- Improve capacities for tailored climate information, early warning and climate impact analysis in the agricultural sectors and enhance outreach to local level
- Knowledge building and awareness creation on DRR & CCA
- Awareness creation, knowledge and information dissemination on DRR and CCA in the agricultural sectors
- Promote adequate DRR capabilities among local stakeholders
- Increased capacities to apply technical options to reduce underlying risk factors in agriculture, forestry and fisheries
- Systematically assess, document, share and adapt good practice options to location specific needs in a participatory way with farmers.
- Promote most effective location and hazard specific disaster risk mitigation practices for Agriculture, Forestry and Fisheries island wide.
- Preparedness for effective emergency response in the agricultural sectors
- Initiate better preparedness activities at national and local levels for DRR and CCA.

4.4 Monitoring and revision of the strategic framework

This strategic framework shall be reviewed biannually by the Agricultural Planning Unit in MALFF supported by the MALFF working group on disaster risk reduction (to be established as part of the implementation of the strategy, see Annex 2 for Draft Terms of References of the Group) in collaboration with all involved stakeholders. This working group shall also pursue the implementation of the Strategic Framework, including mobilization of additional resources and monitor progress in implementation. Monitoring indicators should be defined for all actions.

Main Result Area -1		EFFICIENT INSTITUTIONAL SET-UP FOR DRM IN MALFF													
GOAL		Ensure efficient institutional capacities and coordination within MALFF covering all aspects of DRM related to the agricultural sectors (crop, livestock, forestry, fisheries, water resources etc.) and coordinating with other agencies involved in DRM and CCA.													
GAPS TO BE ADDRESSED		At present there is no specific entity under MALFF mandated to be responsible for DRM and CC. The new challenges of DRR and CC require an adjustment of tasks and responsibilities in MALFF, including partnerships and networks with other stakeholders.													
STRATEGY-1		Institutionalize DRR and CC within MALFF					YEAR						PRIORITY	LEAD RESPONSIBILITY	IN COORDINATION WITH
							1	2	3	4	5	> 5			
ACTIONS	1. Nominate a MALFF Focal point for DRR/CC and establish a technical working group composed of departmental focal points from all MALFF departments to coordinate the institutionalisation and delivery of DRM and CCA within agriculture, livestock, fisheries and forestry. The MALFF Focal point for DRR/CC would chair the working group	x										Very high	MALFF		
	2. Incorporate DRM and CCA into MALFFs policies and sector planning including enforcement measures.	x	x	x					x			Very high	MALFF		
	3. Ensure efficient and transparent communication mechanism within MALFF related to DRM and CC	x										Very high			
	4. Review MALFFs programmes and activities to identify activities that directly relate to DRR and CCA and gaps. Further integrate DRR and CCA in MALFFs portfolio.	x										Very high	MALFF		
	5. Organize needs-based training for all levels of MALFF staff on DRM and CCA.		x									Medium	MALFF		
	6. Define roles and responsibilities of MALFF staff regarding DRR/CC and gradually incorporate DRR and CC related activities into job-descriptions of MALFF staff	x	x	x	x	x	x	x				Medium	MALFF		
	7. Develop detailed annual implementation plans for each main result area to roll out the strategic framework	x	x	x	x	x					Very high	Future focal point DRR /CC in MALFF			
	8. Set up monitoring and evaluation system to monitor DRR and CC related projects and activities of MALFF including on impacts	x	x	x							high	Future focal point DRR /CC in MALFF			
	9. Develop an integrated resource mobilization strategy for DRR and CC implementation programmes through MALFF	x	x	x	x	x	x				Very high	MALFF			

STRATEGY-2		Strengthen complementary collaboration with other key actors in DRM									
ACTIONS	1. Enhance operational relations with NEMO to strengthen the role of the agricultural sector in national DRM framework through establishment of an Agricultural subcommittee under NEMO	x	x	x	x	x	x	Very high	MALFF	NEMO	
	2. Enhance operational relations with relevant national and regional government and non-government institutions to jointly deliver improved services for DRR and CCA to agricultural producers	x	x	x	x	x	x	Very high	MALFF	MET, OECS, UWI, IICA, CARDI, ...	
	3. Ensure adequate representation of MALFF staff in disaster committees at national and district levels.	x						Very high	MALFF	NEMO, insurance council, IICA/CARD I, ...	

Main Result Area -2		ENHANCED APPLICATION OF CLIMATE INFORMATION AND EARLY WARNING SYSTEMS IN THE AGRICULTURAL SECTORS													
GOAL		Improve knowledge and access of local communities to climate information and early warning messages tailored to the needs of agricultural producers													
GAPS TO BE ADDRESSED		MALFF has no specific strategies on developing climate information products for agricultural producers, early warning systems and impact assessment. There is a need to improve early warning systems including the outreach to local level.													
STRATEGY		Improve capacities for tailored climate information, early warning and climate impact analysis in the agriculture sectors and enhance outreach to local level					YEAR						PRIORITY	LEAD RESPONSIBILITY	IN COORDINATION WITH
							1	2	3	4	5	>5			
ACTIONS	1. Perform national integrated current and future climate risk assessment for the agricultural sectors based on hazard impact and vulnerability assessment and use the outcomes for agricultural development planning and disseminate them to key stakeholders.	x										Very high	MALFF	MPDEH	
	2. Perform in all districts Community Risk & Vulnerability Analysis with special focus on the agricultural sectors (consider existing methodologies, e.g. Red Cross, OECS).		x									High	MALFF	MPDEH	
	3. Produce a national fire hazard map and establish national fire monitoring system.		x									Medium	DoFo	Fire Service	
	4. Improve together with Met-Office existing systems and procedures of early warning for drought, drought spells and flood, including improved infrastructure for agro-meteorological and hydrological monitoring, with highest emphasis to ensure outreach to the local levels .	x	x	x	x	x						High	WRMA, MET		
	5. Collaborate with the Met-Office, CCCCC, CAI, CIMH and UWI on tailored climate information products for agricultural producers (incl. seasonal agro-meteorological forecasts and long term climate impact scenarios), train extension staff & MALFFs communication unit in disseminating climate information products to farmers.		x	x	x							Medium	DoA, WRMA, MET	CAI, CIMH, UWI, MALFF Comm.Unit	
	6. Strengthen monitoring and warning systems for river siltation, and for pests and diseases in agriculture, forestry, fisheries		x									Medium	MALFF		

Main Result Area -3		KNOWLEDGE BUILDING AND AWARENESS RAISING													
GOAL		Use knowledge and training to build a culture of innovation, safety and resilience, and institutionalize training on DRR and CC in MALFF.													
GAPS TO BE ADDRESSED		The knowledge of MALFF staff and agricultural producers about DRR and CCA and the operational skills needed to implement disaster prevention, mitigation and preparedness activities is limited.													
STRATEGY-1		Create awareness and disseminate knowledge and information on DRR and CCA in the agricultural sectors					YEAR						PRIORITY	LEAD RESPONSIBILITY	COORDINATED WITH
							1	2	3	4	5	>5			
	1. Incorporate the DRR specific communication strategy developed under MALFF/FAO DRR project into MALFFs existing communication strategy; and systematically disseminate information related to DRR and CCA		x									Medium	MALFF CommUnit	MALFF departments	
	2. Prepare tailor made information, education and communication materials on DRR and CCA for agricultural producers like posters, leaflets, crop-calendars, billboards.		x									Very high	MALFF CommUnit	MALFF departm., Min. of Education	
	3. Develop a database for DRM and CCA which includes agro-climatic information, census data, production data, damage and loss data, information about technologies etc. It should be compatible with and link to the database system in MALFF.		x	x								Very high	MALFF Stats Unit	MALFF departments	
	4. Mandate one consolidated national GIS entity, to produce DRR/CC related hazard and risk mapping , and enforce regulations to facilitate data access for all government agencies, (incl. hazard and vulnerability information, damage assessments) ; this entity shall be capacitated to deliver training on GIS		x	x								Medium	MALFF	MPDEH	
STRATEGY-2		Promote adequate DRR capabilities among local stakeholders													
ACTIONS	1. Organize field based learning sessions (including through farmer field schools) on DRM and CCA with groups of farmers and fishermen and local government units to develop community based multi hazard disaster risk management plans; and assist them in submitting the plans to available funding sources.		x	x	x	x						Very high	MALFF advisory services	NEMO, Producer organisations, local government	
	2. Collaborate with Ministry of Education and Sir Arthur Lewis College to promote sector specific education on DRM and CC in schools and colleges, and for inclusion of DRR & CC issues into the curriculum				x	x	x					Medium	MALFF advisory services, youth program	Min. of Education, Sir Arthur Lewis College	

Main Result Area -4		TECHNICAL OPTIONS TO REDUCE THE UNDERLYING RISK FACTORS IN AGRICULTURE, FORESTRY AND FISHERIES									
GOAL		To increase capacities of extension staff and agricultural producers to apply good practices for increasing local resilience against hazards and climate risks.									
GAPS TO BE ADDRESSED		The spectrum of available, field tested options for DRR CCA at national/international level is limited and often not known or easily accessible at community level. Existing local good practices for DRR and CCA in the agricultural sectors are not systematically documented and shared. Innovative practices need to be identified and tested in location specific contexts. Further, agricultural producers often are not aware how certain good practices which they may already know increase their resilience against hazards and climate risks.									
STRATEGY-1		Systematically assess, document and adapt good practice options to location specific needs in a participatory way with agricultural producers.					YEAR		PRIORITY	LEAD RESPONSIBILITY	COORDINATED WITH
		1	2	3	4	5	>5				
ACTIONS	1. With strong community participation develop a menu of good practices (list of options by hazard and technical guidelines) in agriculture, forestry, fisheries and water resources for DRR and CCA for each region of Saint Lucia.	x	x	x				Very high	MALFF advisory services	Producers	
	2. Monitor the application of practices at demonstration sites and identify most effective practices, compile the information, incl. photographs and lessons learnt into training materials for other groups.	x	x	x				High	MALFF advisory services	Producers	
STRATEGY-2		Promote most effective location and hazard specific disaster risk mitigation practices in agriculture, forestry and fisheries island wide.									
ACTIONS	1. Initiate a systematic training process for training of trainers for MALFF extension and advisory services on small scale technical options for DRR and CCA.		x	x				High	MALFF advisory services	UWI	
	2. Promote and support through the MALFF extension system the local application of disaster prevention and risk mitigation technologies and livelihood diversification strategies through advisory and extension services.		x	x	x	x		Very high	MALFF advisory services		
	3. Strengthen agricultural producer groups and organisations to transmit technical knowledge and skills for executing community based risk reduction practices		x	x	x	x		High	MALFF advisory services	Min. of Cooperatives, CARDI/IICA	
	4. Improve access of agricultural producers to financial risk sharing mechanisms: assess scope and feasibility for developing a viable model for agricultural insurance for Saint Lucia or the Eastern Caribbean subregion (link with initiatives from OECS & CARICOM)		x					Very high	MALFF, DoA	Insurance Council, NEMO	

Main Result Area -5		PREPAREDNESS FOR EFFECTIVE EMERGENCY RESPONSE IN THE AGRICULTURAL SECTORS													
GOAL		Save lives, reduce asset losses and disaster impacts on agriculture, forestry, fisheries and water resources													
GAPS TO BE ADDRESSED		Disaster response in the agricultural sectors has largely been reactive rather than proactive in the past. MALFF has recently developed some hazard specific emergency plans (pest and diseases, wildfire). However, these plans have not yet been fully implemented. Preparedness activities need to be institutionalized and systematically strengthened at all levels.													
STRATEGY		Initiate better preparedness activities at national and local level for DRR and CCA.					YEAR						PRIORITY	LEAD RESPONSIBILITY	COORDINATED WITH
							1	2	3	4	5	>5			
ACTIONS	1. Prepare a hazard impact assessment methodology integrating regular baseline assessments with a livelihood based damage, loss and needs assessment for agriculture. The combined methodology will help MALFF to keep regularly updated community profiles as the basis for reliable post disaster socio-economic damage and impact assessments in hazard affected communities.	x	x	x								High	MALFF	NEMO, MPDEH	
	2. Guide the formulation and review of emergency preparedness and contingency plans for the agricultural sectors as part of national disaster framework coordinated by NEMO, specifically finalize emergency plan for pests and diseases in agriculture, forestry and fisheries	x	x									Very high	MALFF	NEMO	
	3. Support NEMO in advocating for integrated resource mobilisation for response and mitigation to provide assistance to communities and individuals for local disaster risk management actions, including DRR		x	x								Very high	MALFF	NEMO	
	4. Continuously maintain and roll over basic buffer stock at national level of key inputs (seeds, fertilizer, pesticides, animal feed and supplies for medicine) for distribution and replenishment of contingency stores during a threatened disaster alert or in the aftermath of a disaster emergency;	x	x	x	x	x	x					Very high	DoA	NEMO	

Other items for potential inclusion:

- hazard and climate proofing of new large scale infrastructure in agricultural sectors
- support MPDEH in the development of a comprehensive land use plan, incl. land zoning
- assess financial resources needed for the implementation of the plan and development of a strategy for resource mobilisation
- enhance capacity for increased use of GIS for monitoring and evaluating hazard and climate change impacts on the agricultural sectors

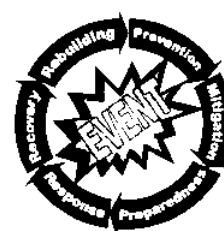
GLOSSARY AND DEFINITIONS

Adaptation means the adjustment in the natural or human system in response to actual or expected climatic stimuli or their effects, which moderates harm and exploits beneficial opportunities.

Climate Change – Change observed in the climate on a global, regional or sub-regional scale caused by natural processes and/or human activity. Climate change adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Disaster – A serious disruption of the functioning of a community or a society, causing widespread human, material, economic or environmental losses that exceed the ability of the affected community/society to cope using only its own resources. Disasters are often classified according to their cause (natural or manmade).

Disaster Risk Management and Disaster Risk Reduction (DRM) Disaster Risk Management is a continuum of processes and actions related to Prevention, Mitigation, Preparedness, Response, Rehabilitation, and Reconstruction. Disaster Risk Reduction is a subset of DRM developing capacities and promoting policies, processes and actions with a focus on prevention, mitigation and better preparedness for response.



I. Prevention:

Measures taken for the purpose of preventing natural or man-made phenomena from causing or giving rise to disasters or other emergency situations.

II. Mitigation

Measures taken to reduce the loss of life, livelihood and property by disasters, either by reducing vulnerability or by modifying the hazard where possible.

III. Preparedness

Measures taken to reduce the impact of disasters through the prior organising of systems to promptly and efficiently respond to them. Preparedness addresses actions in both the pre-disaster phase, for example, warning and evacuation, as well as the post-disaster phase.

IV. Response

Actions carried out in a disaster situation with the objective to save lives, alleviate suffering and reduce economic losses.

V. Rehabilitation

The short-term repair of physical, social and economic damage – basically enough to get back on one's feet.

VI. Reconstruction

The medium- and long-term repair of physical, social and economic damage, and the return of affected structures to a condition equal to or better than before the disaster.

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 (UN ISDR).

Disaster risk reduction (DRR) - Activities 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: (i) Risk awareness and assessment; (2) Knowledge development; (3) Public commitment and institutional frameworks; (4) application of multitude of measures, (5) Early warning systems, preparedness measures and reaction capacities (UN ISDR).

Hazard – A potentially damaging physical event, phenomenon and or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Natural Hazard – Natural processes or phenomena occurring in the biosphere that may constitute a damaging event.

Risk – The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damage) resulting from interactions between natural or human induced hazards and vulnerable conditions. Conventionally, risk is expressed by the equation $\text{Risk} = \text{Hazard} \times \text{Vulnerability}$ (UN ISDR)

Strategy is a broad Strategic Framework that is implemented through policies and measures. Strategies can be comprehensive (i.e. focusing on national, cross sectional levels) or targeted (i.e. focusing on specific sectors regions or measures).

Sustainable Development – Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Uncertainty is an expression of the degree to which a value (e.g. the future state of the climate system) is unknown.

Vulnerability – A set of conditions and processes resulting from physical, social, economic, and environmental factors, which increases the susceptibility of a community to the impact of hazards.

ANNEXES

Annex 1 Results from institutional SWOT analysis of MALFF and Agriculture Sector capacities for DRR

The Ministry of Agriculture, Land, Forestry and Fisheries (MALFF)

– mandate, structure and activities related to DRM and CCA

The Ministry of Agriculture, Land, Forestry and Fisheries (MALFF) consists of three technical departments, plus the newly created Water Resources Management Agency and the administration, including the corporate planning unit (see Figure 4). MALFF is represented on most of the National Disaster Committees and some of the District Disaster Committees. MALFF also contributes five members to the National Climate Change Committee. However, a National Disaster Committee on agriculture under the national disaster framework is lacking. In the following, the overall mandate and current activities related to disaster risk reduction and climate change adaptation are summarized.

1.1 The Department of Agriculture

Mission: To develop the Agricultural Sector to ensure increased production of quality food and other commodities through environmentally sustainable management practices for the benefit of the entire population.

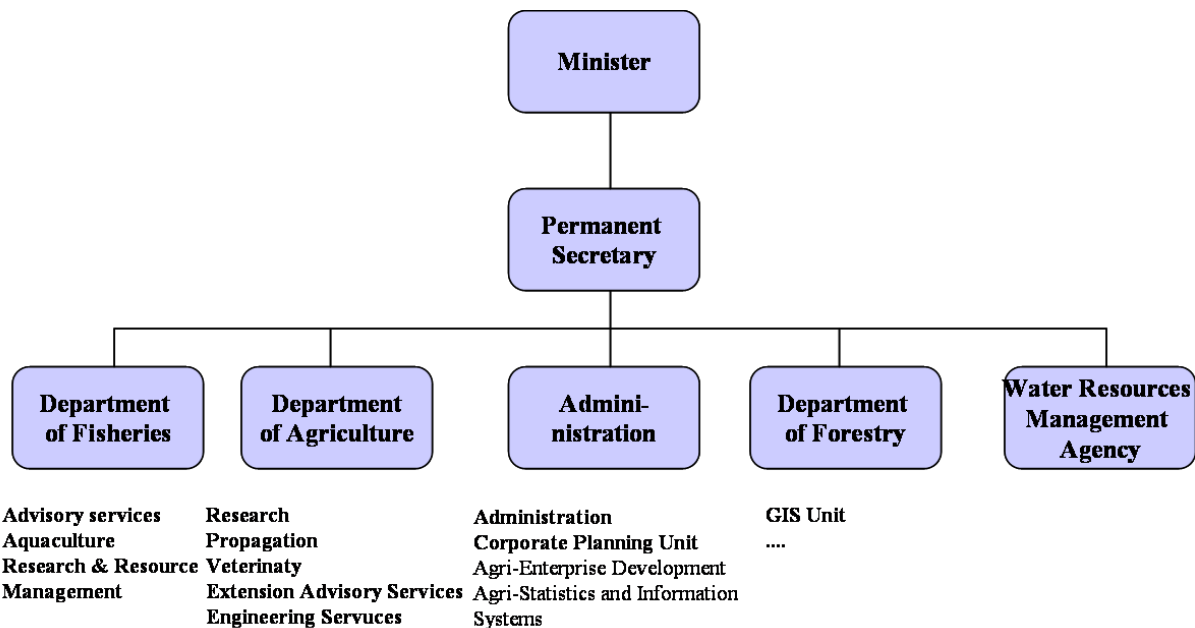


Figure 4 Schematic overview of structure of the Ministry of Agriculture, Land, Forestry and Fisheries (MALFF)

Objectives: To increase Agricultural Productivity, thereby: (1) Facilitate technology generation and transfer, (2) Secure food supplies through promoting effective management of Crop and Livestock enterprises; (3) Promote conservation of the country’s natural resource base; (4) Assist in the establishment and maintenance of proper marketing and distribution channels; (5) Promote the optimal

utilization of the factors of production and; (6) Assist in human capacity building for efficient development of agricultural production enterprise;

In 2009 the extension service of the Department of Agriculture has been reoriented from a commodity centred approach to a general approach after about 30 years. This allows a better utilization of human resources and facilitates the mainstreaming of crosscutting themes such as DRR and CCA. However, so far the agricultural extension activities are mostly production oriented, with emphasis on crops but also trying to develop the livestock sector. The engineering division promotes improved technologies for soil and water management, in particular related to drainage and rain water harvesting. The chief agricultural extension officer and the biodiversity focal point are members of the national climate change committee but not directly involved in the implementation of field projects on climate change. Several youth projects mainly focus on backyard school gardening. The extension staff is deeply involved in disaster relief but also in disaster preparedness activities, such as hurricane safety of greenhouses. The only engagement in disaster risk mitigation is the MALFF/FAO Project, which is led by the department. The statistics unit (as part of Corporate Planning Unit) is in charge of developing a comprehensive information system which allows the integration of production monitoring data but does not include climate or disaster related data. It has been thought of to visualize the census data in an Atlas.

1.2 The Department of Fisheries

Mission: To promote self-sufficiency through increased production of Marine and Aquaculture products, and to develop the fishing industry and implement measures to ensure its sustainability. Activities include: (i) Modernization of fisheries infrastructure and vessels; (ii) use of improved fishing gear and methods; regulation of fishing gear; (iii) Protection of marine biodiversity and Regulation of other marine based activities; and (iv) Development of appropriate fresh water marine aquaculture programs.

The department has drafted its disaster plan which primarily focuses on continuity of business operations but also some ideas regarding DRR. The department currently does not perform any project related to DRR and CCA other than the MALFF/FAO project Disaster risk mitigation, but is fully aware of impacts of disasters (e.g. drought, hurricanes) and climate change (e.g. coral bleaching, shifts in habitats of dolphin and tuna) on the sector and is thinking about preparedness activities for fishermen and their organization. Recently the St. Luica Fisher Folk Cooperative Society Ltd has been launched. There is great potential for community based approaches on the fisheries sector. Some of the new infrastructure, namely a fisheries facility and a new hatchery considered natural disasters in their design. The department is engaged in the finalization of the Tsunami Plan and the Coastal Zone Management Plan.

1.3 The Department of Forestry

Mission: Protect and conserve the natural resources for the protection of the environment and to obtain maximum utilization consistent with sustainable development with regards to the welfare of the rural communities and the country as a whole.

Objectives: advance the areas of Forest Reservation, Natural Resource Management, Utilization, Environmental Education, Wildlife Conservation, Co-Management, Research, Recreation, Aesthetics, and Forest Extension.

Through the EU funded SFA projects the department recently completed a comprehensive forest inventory, a biophysical resource assessment, the development of a river bank monitoring and

assessment methodology. A forest management information system (SL FMIS) is in development to enter and visualize forest inventory data, linking existing access databases and GIS. The department is currently engaged in several donor funded projects relevant for DRR & CCA such as the Green Iguana mapping project (an invasive species), the IWCAM Project and its contribution to the SLM Project as national UNCCD focal point. Priorities for 2011 are the development of a five years programme for riverbank rehabilitation, the implementation of the wildlife management plan and an update of the sustainable forest management plan. The department also started efforts to map forest fires and would like to produce a fire risk map in the future. The department promotes agro forestry and sustainable land management.

1.4 Water Resources management Agency (WRMA)

The Water Resources Management Agency (WRMA) became functional at the end of 2008. The sustainable management of Saint Lucia's water resources is the primary objective and mandate of the Agency. To achieve this, the agency follows an integrated approach for water resources management. With currently only five staff, the agency is understaffed but hopes to expand in the future to be able to fulfill its mandate. At the moment, the agency mainly focuses on (i) Hydrologic data collection, compilation, and analysis, (ii) Water resources investigation and assessment for agricultural developments and (iii) Water resources allocation through licensing. Envisioned activities also include: environmental monitoring and impact assessment; developing watershed management plans; selection of waste discharge sites and hydrological forecasting.

The Agency head is a member of the National Climate Change Committee, but no on the ground climate change projects are taking place so far. The agency advises the minister in water related emergencies. The severe drought in 2009/2010 was the first "real" test of the Drought Plan and revealed potential improvements in the arrangements between the Meteorological Service and the WRMA which still have to be formalized. The agency is engaged in the development of a Local Flood Early Warning System under the JICA funded Caribbean Disaster Management Project II. However, the transferability of the approach is hampered by the lack of equipment for runoff measurements.

1.5 Coordination mechanism within MALFF for DRR and CCA

Each department has defined focal points for disaster risk management and climate change to provide input to various national committees and initiatives outside the ministry, such as the National Climate Change Committee and various national disaster committees. However, no formal coordination mechanism exists within MALFF to systematically address DRR and CCA within the agricultural sectors.

II. CAPACITY ANALYSIS FOR ENHANCED DRR IN AGRICULTURE

2.1 SWOT analysis results; MALF and its departments

The following tables present the results of the SWOT analysis of MALFF including strengths, weaknesses, opportunities and threats. They clearly show the various strengths of MALFF, that give an idea of its potential as a key institution for DRR and CCA in the agricultural sectors. It is crucial to better understand how to effectively utilize MALFF's strengths for better DRR planning and implementation in the agricultural sectors and how to overcome its weaknesses. This Strategic Framework builds on the strengths and addresses gaps and weaknesses.

Table 1a Institutional strengths of MALFF with regard to its role in DRR and CCA

Institutional Strengths	Remarks
MALFF has a sound human resources base to contribute at all levels in Saint Lucia to DRR and CCA	Good infrastructure in the form of MALFF offices at national, regional and district level. Especially through agricultural extension services strong linkages to farming communities. However, the number of staff in the agricultural extension service has been significantly reduced in the last years. MALFF is already engaged in many disaster management activities, especially in disaster response and rehabilitation and providing relief to the agricultural community.
Availability of basic data; Agricultural Data Base	MALFF has an excellent collection of data: including an inventory of all farm characteristics (Agricultural Census 2007, 1996, 1986), all fishing vessels (continuously) and forest resources. MALFFs databases will be important for preparing DRR plans at various levels.
Existing Communication mechanisms of MALFF	MALFF has a central communication unit which collects and disseminates agricultural information through mass media up to grass root level. The Unit is closely linked to the Government Information Service. Efforts to include DRR and CCA in these communication activities have been initiated.
Mechanisms for Coordination within MALFF and with other stakeholders (incl. research) exist	Given the small size of the country and the ministry collaboration across departments and with partners is relatively easy and often based on personal relationships, rather than formal coordination mechanisms. The MALFF department heads have a planning meeting every month. MALFF meets at least once a year with the research institutes (CARDI, IICA) to determine priorities for research.
Established Water Resources Management Agency	The establishment of the Water Resource Management Agency has great potential to strengthen MALFFs activities related to hydrological monitoring and early warning on drought and floods as well as Integrated Water Resources Management which are highly relevant to DRR and CCA. However, at the moment the agency is lacking manpower and equipment.

Table 1b Technical strengths of MALFF with regard to its role in DRR and CCA

Technical strengths	Remarks
Sound technical know how in agriculture, including for hazard risk management	MALFF staff is well trained and experienced in tackling agriculture related problems. They are also fully aware of disaster problems and are involved in managing disaster response. With some additional formal and on the job training on DRR concepts and adapted technologies, they could also contribute to disaster prevention, mitigation and preparedness in the agriculture sectors. Most advisory and extension staff has recently been exposed to training activities related to DRR and CCA.
Practical experience in the application of a range of extension and awareness raising methods	MALFF departments are well experienced with a range of extension methods to interact with the target groups, including mass media, agriculture fairs, group discussions, farmer field trainings, demonstrations and field visits. Since 2009, MALFF is engaged in farmer field schools. After a first round of TOT for extension workers, farmer field schools were piloted in five provinces. 93 farmers graduated in July 2010 and provided positive feedback.

Experiences from project implementation by MALFF	MALFF has been involved in implementing a number of development and research projects, several of them directly or indirectly related to DRR. The outputs and experiences of these projects can be used for DRR and CCA in agriculture.
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Table 2a Institutional shortcomings of MALFF to support in DRM and CCA

Institutional weaknesses	Remarks
No efficient/effective plan available at present for DRR & CCA in agriculture	Though MALFF is deeply involved in disaster response and relief activities, emergency procedures for the sector are scattered and several plans exist only in draft form. Until recently, MALFF was not much concerned about systematic disaster preparedness and mitigation and prevention aspects. Strategies for mainstreaming DRR & CCA in MALFFs interventions have not yet been developed.
Few MALFF policies and strategies highlight DRM and CCA	The importance of the agricultural sectors in CCA and the need for proactive DRR has just been surfaced. Although, the agricultural policy 2009-2015 recognizes the impacts of CC and disasters on the sector and refers to risk mitigation as a sub item, DRM and CCA issues are not given adequate priority.
No internal platform on DRM and CCA in MALFF	MALFF has no internal institutional platform on DRM where DRR & CCA issues can be dealt with as a priority by a group of expertw. Although several MALFF staff are members of the national climate change committee and various national disaster committees no group exists within MALFF to systematically analyze the potentials of the ministry in DRM and CCA.
The current funding for DRR activities in MALFF is not sufficient	There is no direct regular budgeting provision for DRR and/or CCA interventions in MALFF.
No mechanism for continuous capacity building related activities exists.	Organizational staffs have very limited practical experiences in proactive disaster preparedness, mitigation and prevention activities. While the agricultural extension staff have recently undergone several trainings, other departments call for more systematic capacity building integrated with their work plan.
Scattered information base for DRR and CCA	The comprehensive database which brings together production and crop monitoring data is still under development. Data from damage assessments is not systematically stored for further analysis. The databases of the different departments are often not linked. User friendly systems for collecting and disseminating information are often lacking.

Table 2a Technical shortcomings of MALFF to support in DRM and CCA

Technical weaknesses	Remarks
Little engagement in climate information products and early warning	MALFF has no specific strategies on developing climate information products, early warning system and impact assessment. As a consequence community people do not get any sort of agricultural/hydrological forecasting from MALFF
Community mobilization for DRR and CCA insufficient	MALFF needs to be more focused on the community mobilization process. MALFF should also carry out intensive community based risk and vulnerability analysis in the agricultural sectors and awareness campaigns on climate change and agriculture. MALFF is facing an increased demand for collaboration with a wide range of stakeholders including NGOs, community organizations, producer groups, etc.
Capacity building for	MALFF has no systematic strategy on how to increase the capacity

vulnerable communities on DRR & CCA insufficient	of vulnerable communities/local institutions to address DRR & CCA in the agricultural sectors. MALFF lacks financial resources to provide more training to agricultural producers and resource managers and to upscale the Farmer Field School model.
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Table 3 Opportunities for MALFF relevant for DRM and CCA

Opportunities	Remarks
Government support to the agricultural sectors	The current government is committed to revitalize the agricultural sectors.
Influx of new staff could favour take up of new topics	The fact that a significant amount of MALFF staff will retire within the next few years, may provide an opportunity for young, dynamic staff to take on new topics, such as DRM and CCA.
Global attention to agricultural sectors	The agricultural sectors in Saint Lucia may benefit from the recently regained attention to the sector at the global level. Various donors have significantly increased their funding into sector.
Global attention to DRM and CCA	The agricultural sectors in Saint Lucia may benefit from the new global focus on DRM and climate change. Saint Lucia belongs to the most vulnerable countries and is therefore likely to be able to attract donor funding, including for agriculture, forestry, fisheries/coastal zones and water resources.
Access donor funds under new DRR and CCA funding mechanisms	MALFF has know how and tested processes to assist farmers in resilience building to hazard impacts; additional funds needed for wider dissemination and replication.

Table 4 Potential threats to MALFF relevant to DRM and CCA

Threats	Remarks
Further transfer of resources to other sectors	As Saint Lucia is developing towards a service oriented economy there is a net transfer of resources from the agricultural sectors to other sector, in particular tourism. While the current government also gives attention to the development of the agricultural sectors there is a threat that this could change in case of a change in government.
Aging MALFF staff/retirements may hinder taking on new themes immediately	Several managers within MALFF will retire within next three years. Political issues around the refilling of these positions and further cutting of posts could possibly prevent MALFF from immediate and broad commitment to new issues, such as DRR and CCA
Framework implementation hampered through lack of resources	A potential further sharp decline in the financial and human resources within MALFF may hamper the implementation of any DRR and CCA framework for the agricultural sectors.
Hazard impacts could counteract efforts in reducing vulnerabilities	The number and intensity of disasters may increase in Saint Lucia and counteract efforts in disaster risk mitigation.

2.2 Other players relevant for DRR and CCA in the agricultural sectors and coordination mechanisms

a) Research institutions

CARDI in Saint Lucia - Caribbean Agricultural Research and Development Institute

Established in 1975, CARDI is the leading agricultural research and development organisation in the Caribbean. CARDI's mandate ranges from technology generation, adaptation and transfer (e.g., drip irrigation), and marketing development to research coordination and linkages. CARDI deals with various farming systems, including vegetables (e.g. Tomato, Hot Pepper), fruit and tree crops (e.g. Breadfruit, Mango, Papaya, Passion Fruit), and food and root crops (e.g. banana, dwarf home and apem plantains, white yam, sweet potato, peanut). In Saint Lucia, the institute has three staff (one representative plus two technical experts) and is mainly engaged in capacity building and running a research station in Dennery, but does currently perform no activities specifically addressing DRR, CCA or integrated farming systems. At the regional level, CARDI has developed a climate change programme, including several workshops/trainings and a pilot project on the impact of climate change on pests and diseases. It also has established Germplasm banks in several islands for hurricane preparedness.

IICA in Saint Lucia - Inter-American Institute for Cooperation on Agriculture

IICA is the specialized, intergovernmental agency for agriculture of the Inter-American system. IICA's purpose is to encourage, promote and support the efforts of the Member States to achieve agricultural development and rural well being. Its office in Saint Lucia was opened in 1983. Technical cooperation activities in Saint Lucia have been in the areas of plant and animal health, rural development, technology generation and transfer, supporting the development of fruit crops, and agricultural sector planning. Strategic areas include: (i) policies and trade (e.g. marketing fruit tree crops), (ii) science technology and natural resources, (iii) rural development (e.g. strengthened farmer organization), and (iv) agricultural health and food safety (e.g. strengthened pest management capabilities). IICA does not implement any project specifically addressing DRR and CCA in Saint Lucia. However, some projects, for example, dealing with greenhouses, biogas technologies and pest management are related.

The Disaster Risk Reduction Centre (DRRC) at the University of West Indies

The DRRC was launched in 2006 in response to a recognized need for multidisciplinary training, research and technical expertise in disaster response and risk reduction in Caribbean communities. The Centre complements the work of CDEMA. The University of the West Indies is equipped with a virtual library, the Caribbean Disaster Information Network (CARDIN) that provides linkages with Caribbean and International disaster organizations. Current projects focus on: the role of education in DRR, an overview of early warning systems in the Caribbean, and a Caribbean Risk Atlas for floods, hurricanes and earthquakes for a selected number of CARICOM countries.

Caribbean Environmental Health Institute (CEHI)

CEHI's mission is to provide Environmental Health leadership to Member States in order to improve and support related policy development decisions. The institute is very active in the field of (i) Integrated Watershed and Coastal Area Management, including community based approaches, (ii) waste management, (iii) cleaner Production, (iv) chemical and pesticide management, and (v) climate change and human health.

b) Other governmental agencies

Sustainable Development and Environment Section (Ministry Physical Planning, Environment, Housing)

The SDE Section of the Ministry is the national focal point for climate change. The release of the Second National Communication on Climate Change is envisioned for end of 2010. In this context

national vulnerability and adaptation capacity assessments have been commissioned for all sectors. The section also leads the implementation of the SPACC Project in Saint Lucia.

Physical Planning and Survey Sections (Ministry Physical Planning, Environment, Housing)

The PP section of the ministry is the custodian for all maps related to hazards and land use. The following national hazard maps are available at scales between 1:10,000 and 1:50,000: Landslide hazard map, Debris Risk Severity, Drought Susceptibility and Vulnerability Maps, Volcanic Risk Map, Coastal Flooding Map, Wind Hazard Map) (see Annex 7). A digital repository of the hazard maps exists but GIS analysis is currently not possible due to lack of electronic version of several base maps, different classification systems and the lack of a comprehensive, national land use map. The survey section is pursuing the establishment of a national GIS entity until 2013 which would allow a harmonized processing and analysis of all national maps.

Meteorological Services (Ministry of Communications, Works, Transport & Public Utilities)

Mission: To provide timely and accurate weather information so as to mitigate loss of life and property and to contribute to the socio-economic development of our country and the world at large.

DRR & CCA The Saint Lucia Meteorological Services has established an early warning system that comprises the following major components (1) Satellite Imagery Reception at the Hewanora Met Office, (2) Local Flood Warning System through 14 Automatic Weather Stations (AWS) which report via VHF radio to base computers at the two local Met Offices and alarms are triggered when certain thresholds in rainfall intensity are reached, (3) Local Observational Network, with additionally two manned weather stations and the HAM Radio Weather Network with four AWS. Main communication channels for data acquisition and disseminating critical weather bulletins, warnings and advisories are: Internet, Phone, Fax and HF Radio. The drought monitoring system is based on the standard precipitation index. There is a new, regional EU funded 2-years project implemented by the Caribbean Agromet Institute and the Caribbean Institute for Meteorology and Hydrology for improved climate information products for farmers. Although the current Met Service staff does not include Agro meteorologists there are a few people who will be engaged in the project. Linkages with MALFFs agromet experts should be strengthened. Collaboration with WRMA is working well, however limited staff of WRMA hampers development of improved joint products. The Director of the Meteorological Services is national focal point for Tsunamis.

OECS – Organisation of Eastern Caribbean States

The head office of OECS is based in Saint Lucia. A key role for DRR plays the Environment and sustainable development unit (ESDU) which coordinates environmental activities and manages the natural resources and sustainable resources in the OECS. Saint Lucia is reporting every three years to OECS its progress in the implementation of Comprehensive disaster risk management using the OECS Benchmark Tool (BTool). The OECS secretariat implements its Disaster Response and Risk Reduction Programme, which focuses on building the resilience of communities to withstand the impacts of disaster events.

c) Private sector and civil society

CBO's, Private Sector and Commodity Groups

A number of agencies are directly involved through projects and training or through their policies impact on DRR and CCA. Included among these groups are farmers organisations (e.g. FairTrade Organisation, Broiler Association and other livestock CBO's), St. Lucia Development Bank and other commercial banks and Financial Cooperatives, Chamber of Agriculture, Caribbean Agri-Business Association (CABA), WINFA, CFL (Supermarket and supplier chain), Goddard Group of Companies, Winfresh, and Fisher groups

Maritime Management Associations (MMAs)

The fisheries department closely collaborates with the Marine Management Associations in Soufriere (SMMA) and Canaries/Anse La Raye (CAMMA) in community based coastal zone management. SMMA activities mainly relate to (i) regular monitoring of coral reefs, water quality and other environmental factors and resources, (ii) the development of the fishing sector and (3) the mitigation of impacts from land-based activities.

Annex 2 Draft - Terms of References for MALFF working group on DRR & CCA

[VERY FIRST DRAFT, TO BE ELABORATED]

Name of the Working Group:

Disaster Risk Management Technical Working Group of MALFF

Overall objective:

The overall objective of the Technical Working Group is to coordinate the institutionalization of disaster risk reduction (DRR) including prevention, mitigation, preparedness and climate change adaptation in MALFF.

Composition of the group:

The working group consists of 6 to 10 members with the CAPO as chair and the Agricultural Planning Unit of MALFF acting as secretariat for the Group.

The following composition is suggested. Specific members should be designated with alternates in exceptional cases to enable continuity and effective work of the group.

Head of Agricultural Planning Unit (acting as Chair of the working group)
Head of Agriculture Department or designated Senior Officer
Head of Livestock Services or designated Senior Officer
Head of Extension Services or designated Senior Officer
Head of Water Resources Management Agency or designated Senior Officer
Head of Forestry Department or designated Senior Officer
Head of Fisheries Department or designated Senior Officer
Other MALFF members of national climate change committee (biodiversity focal point)
Member from Finance Committee

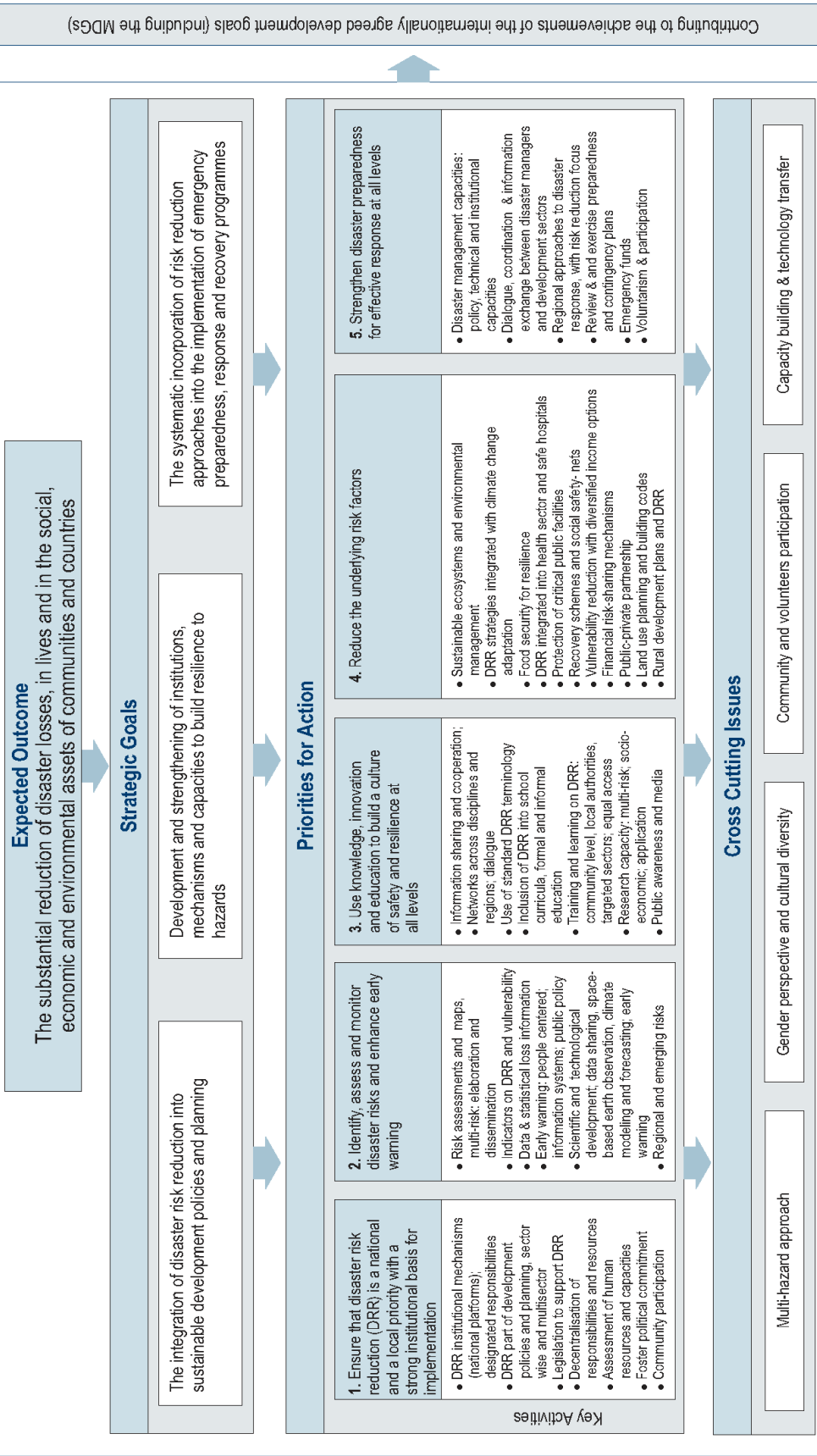
Functions of the group:

To coordinate the institutionalization of disaster risk reduction (prevention, mitigation, preparedness) and climate change adaptation (CCA) measures in MALFF and its implementation at all levels including at communities level, this includes:

- explore options how to institutionalize DRR and CCA in various MALFF departments
- act as centre of coordination for planned DRR & CCA activities within MALFF, such as incorporation of DRR and CCA into MALFFs policies and planning and the review of MALFFs programmes that are directly related to DRR
- foster collaboration with allied ministries, NEMO etc. on DRR & CCA
- assist Agricultural Planning Unit in regular monitoring of the implementation of the Strategic Framework for MALFF on disaster risk reduction in agriculture, forestry and fisheries

SUMMARY of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (Hyogo Framework)

Expected outcome, strategic goals and priorities for action 2005-2015



Annex 4 Enhanced Comprehensive Disaster Management Framework for the Caribbean

GOAL Regional Sustainable Development enhanced through Comprehensive Disaster Management			
PURPOSE <i>'To strengthen regional, national and community level capacity for mitigation, management, and coordinated response to natural and technological hazards, and the effects of climate change.'</i>			
↓ OUTCOME 1:	↓ OUTCOME 2:	↓ OUTCOME 3:	↓ OUTCOME 4:
Enhanced institutional support for CDM Program implementation at national and regional levels	An effective mechanism and programme for management of comprehensive disaster management knowledge has been established	Disaster Risk Management has been mainstreamed at national levels and incorporated into key sectors of national economies (including tourism, health agriculture and nutrition)	Enhanced community resilience in CDERA states/ territories to mitigate and respond to the adverse effects of climate change and disasters
↓	↓	↓	↓
OUTPUTS	OUTPUTS	OUTPUTS	OUTPUTS
<p>1.1 National Disaster Organizations are strengthened for supporting CDM implementation and a CDM program is developed for implementation at the national level</p> <p>1.2 CDERA CU is strengthened and restructured for effectively supporting the adoption of CDM in member countries</p> <p>1.3 Governments of participating states/ territories support CDM and have integrated CDM into national policies and strategies</p> <p>1.4 Donor programming integrates CDM into related environmental, climate change and disaster management programming in the region.</p> <p>1.5 Improved coordination at national and regional levels for disaster management</p> <p>1.6 System for CDM monitoring, evaluation and reporting being built</p>	<p>2.1 Establishment of a Regional Disaster Risk Reduction Network to include a Disaster Risk Reduction Centre and other centres of excellence for knowledge acquisition sharing and management in the region</p> <p>2.2 Infrastructure for fact-based policy and decision making is established /strengthened</p> <p>2.3 Improved understanding and local /community-based knowledge sharing on priority hazards</p> <p>2.4 Existing educational and training materials for Comprehensive Disaster Management are standardized in the region.</p> <p>2.5 A Strategy and curriculum for building a culture of safety is established in the region</p>	<p>3.1 CDM is recognized as the roadmap for building resilience and Decision-makers in the public and private sectors understand and take action on Disaster Risk Management</p> <p>3.2 Disaster Risk Management capacity enhanced for lead sector agencies, National and regional insurance entities, and financial institutions</p> <p>3.3 Hazard information and Disaster Risk Management is integrated into sectoral policies, laws, development planning and operations, and decision-making in tourism, health, agriculture and nutrition, planning and infrastructure</p> <p>3.4 Prevention, Mitigation, Preparedness, Response, recovery and Rehabilitation Procedures developed and implemented in tourism, health, agriculture and nutrition, planning and infrastructure</p>	<p>4.1 Preparedness, response and mitigation capacity (technical and managerial) is enhanced among public, private and civil sector entities for local level management and response</p> <p>4.2 Improved coordination and collaboration between community disaster organizations and other research/data partners including climate change entities for undertaking comprehensive disaster management</p> <p>4.3 Communities more aware and knowledgeable on disaster management and related procedures including safer building techniques</p> <p>4.4 Standardized holistic and gender-sensitive community methodologies for natural and anthropogenic hazard identification and mapping, vulnerability and risk assessments, and recovery and rehabilitation procedures developed and applied in selected communities.</p> <p>4.5 Early Warning Systems for disaster risk reduction enhanced at the community and national levels</p>

Annex 5 Regional Climate Change Framework for the Caribbean 2009-2015

Strategic Element 1: Mainstream climate change adaptation strategies into the sustainable development agendas of the CARICOM Member States.

Goals:

1. Assess the vulnerability and risks associated with a Changing Climate.
2. Reduce vulnerability to a changing climate.
3. Effectively access and utilise resources to reduce vulnerability to a changing climate
4. Build a society that is more informed about and resilient to a Changing Climate
5. Build the CCCCC's capacity to support the implementation of the strategy
6. Reduce the region's carbon footprint through the promotion of energy efficiency measures.

Strategic Element 2: Promote the implementation of specific adaptation measures to address key vulnerabilities in the region.

Goals:

1. Promote the adoption of measures and disseminate information that would make water supply systems resilient to climate-induced damage.
2. Promote the implementation of measures to reduce climate impacts on coastal and marine infrastructure
3. Promote the adoption of measures and dissemination of information that would adapt tourism activities to climate impacts
4. Promote sound conservation practices in coastal and marine ecosystems to shelter these resources from climate-induced damage
5. promote the adoption of sound practices and measures to prevent and/or reduce climate induced health impacts in the community.

E.g. • Revise building codes and develop new standards for road construction; • Implement integrated land-use planning; • Enact national standards for sanitation to reduce water needs and ensure safety; • Develop and test hazard tolerant crop varieties; • Implement public education and awareness programs; and • Develop new legal tools for insurance.

Strategic Element 3: Promote actions to reduce greenhouse gas emissions through fossil fuel reduction and conservation, and switching to renewable and cleaner energy sources.

Goals:

1. promote the use of renewable energy resources
2. support the assessment of wind potential to supply electric power in CARICOM countries
3. support the development of innovative Financing Mechanisms for the deployment of solar water heaters
4. assess the Feasibility of Converting Waste to Energy in CARICOM Countries
5. assess the economic viability of environmental impact offshore-based ocean thermal Conversion plants. .

Strategic Element 4: Promote actions to derive social, economic, and environmental benefits from the prudent management of standing forests in CARICOM countries.

Goals:

1. promote the adoption of best practices for sustainable forest management
2. engage in negotiations with international partners to mobilise resources for the protection of standing forests
3. undertake research aimed at improving current methodologies estimating carbon sequestration rates in tropical forests

Annex 6 National Hazard Policy – Priority areas of action

(i) Incorporation of hazard mitigation measures in all corporate and development planning initiatives and programme budgets.

- i. Incorporate hazard risk reduction into sectoral policies and plans.
- ii. Provide incentives for the use of hazard mitigation practices.
- iii. Develop and implement strategic land use planning.
- iv. Promote the conduct and use of hazard impact assessments in development plans.

(ii) Development, implementation and enforcement of an effective and comprehensive legislative and regulatory framework that supports hazard mitigation.

- i. Review, update and coordinate all existing legislation that has implications for hazard risk management to allow for more effective administration.
- ii. Develop regulations and standards to implement legislation.
- iii. Ensure the incorporation of legislative initiatives that would enhance the responsibilities and participation of the private sector in hazard mitigation measures.
- iv. Strengthen institutional capacity to implement laws, regulations and standards.
- v. Enforcement and periodic revision of legislation and regulations that relate to hazard mitigation.
- vi. Establish an effective monitoring system to ensure that all development initiatives are consistent with the relevant regulatory framework

(iii) Increase public awareness and outreach at every level of society and encourage their involvement in hazard risk reduction

- i. Develop and undertake training programmes aimed at sensitising specific community groups and institutions in hazard mitigation.
- ii. Develop and implement a public awareness programme to sensitise all stakeholders with respect to their roles and responsibilities in hazard risk management.
- iii. Strengthen the financial capacity of local communities and agencies to implement hazard mitigation measures.
- iv. Develop a mechanism and action plan to facilitate participation by community group and individuals.
- v. Regular monitoring and evaluation of the effectiveness of public awareness programmes.

(iv) Promote a collaborative approach among all stakeholder groups for the implementation of hazard mitigation measures.

- i. Design an integrated approach to hazard mitigation involving all stakeholder groups.
- ii. Identify key stakeholder groups and their roles in hazard mitigation.
- iii. Assess the capacity of each stakeholder group to undertake hazard mitigation measures.
- iv. Mobilize all stakeholder groups to undertake hazard mitigation measures.
- v. Regular monitoring and evaluation of the collaborative approach of all stakeholder groups.

(v) Empower local community groups and organisations to undertake hazard mitigation measures.

- i. Develop specific programmes, projects and activities in hazard mitigation for implementation by community groups and organisations.
- ii. Design and conduct appropriate hazard mitigation training programmes for all levels to improve the technical capabilities and attitudes in hazard risk management.
- iii. Include a line item in Government programme budgets for annual hazard mitigation projects to be implemented under the direct management of community groups.
- iv. Develop programmes for recognising the participation as well as contribution of individuals, community groups and organisations in implementing hazard mitigation measures.

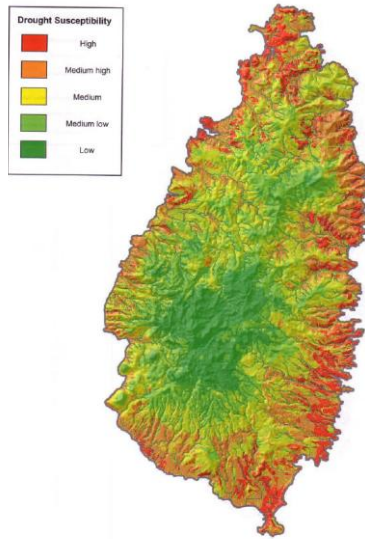
(vi) Development of an effective information system to support multi-sectoral decision-making in the implementation of hazard mitigation measures.

- i. Prepare a comprehensive inventory of existing hazard information.
- ii. Identify baseline data for hazard risk assessment and hazard mitigation.
- iii. Conduct hazard risk assessment and maintain hazard mitigation data and information.
- iv. Develop and maintain information and data on the human resource capacities of various stakeholders including community groups and individuals.
- v. Develop an effective system to disseminate information and data to all stakeholders to facilitate the identification, prioritisation and implementation of hazard mitigation measures.

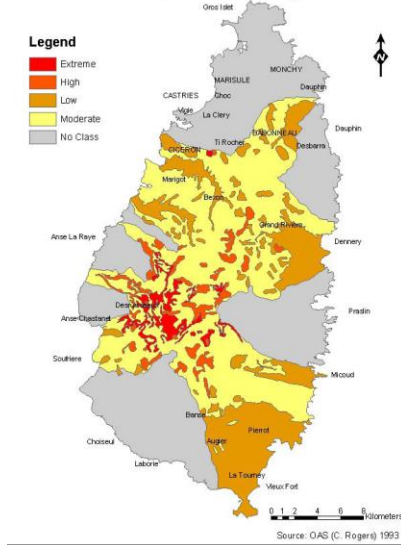
(vii) Determination of the human, technical and financial resources required for implementation of hazard mitigation

- i. Undertake human, technical and financial needs assessment for implementation of the Policy.
- ii. Prepare a responsibility matrix and timeframe for implementing Policy.
- iii. Review and update the Hazard Mitigation Plan in collaboration with all stakeholders.
- iv. Establish mechanisms for monitoring and evaluation of the Policy implementation process

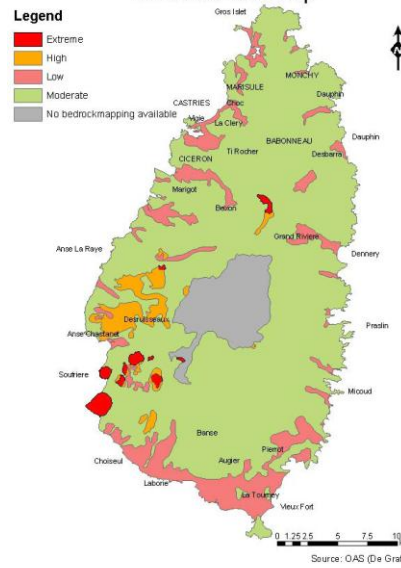
Drought susceptibility map



Debris Risk Severity



Landslide Risk Map



Other hazard maps of Saint Lucia:

- Coastal Flooding Maps.
- Wind Hazard Maps

Annex 8 Expected impacts of climate change on selected sectors in Saint Lucia (Modified from: National Climate Change Risk Register, 2009)

	Sea Level Rise (SLR)/Storms / Hurricanes			Precipitation		Temperature	
	Storm Surge	Coastal Erosion	Winds	Floods	Drought	Extreme Heat Events	Cold Spell
Agriculture	1. Wetlands, mangroves, beach erosion 2. Food security.	1. Wetlands, mangroves, beach erosion 2. Food security	1. Food security	1. Food security	2. Food security. 3. health & food security 4. Forest fires 5. Loss of agricultural land	1. Loss of fish nurseries, invasive fish species. 2. Fish kill. 3. Food security. 4. Forest fires 5. Labour Effects 6. Insect attacks	1. Loss of fish nurseries, invasive fish species. 2. Fish kill. 3. Food security 4. Labour Effects
Forestry [and Bio diversity]	1. Direct damage to natural resources	1. Coral bleaching, species loss 2. Direct damage to natural resources 3. Undercutting traditional knowledge	1. Direct damage to natural resources	1. Higher Species richness 2. Direct damage to natural resources	1. Tree loss 2. Forest fires 3. Pests 4. Direct damage to natural resources 5. Undercutting traditional knowledge	1. Labour Effects 2. Ecosystem functioning, 3. Tree/biodiversity loss affecting tourism 4. Forest fires 5. Pests 6. Direct damage to natural resources 7. Undercutting traditional knowledge	1. Labour Effects 2. Migration of forest species. 3. Tree los. 4. Direct damage to natural resources 5. Undercutting traditional knowledge
Water Resources	1. Human diseases 2. Crop yield reduction (salinity) 3. Reduced water quality (salinity)	1. Reduced water quality (salinity)	1. Human diseases	1. Human diseases 2. Crop yield reduction (salinity)	1. Food utilization & health 2. Higher water demand 3. Less water supply	1. Higher water demand	
Marine and Coastal Recourses	1. Human diseases	1. Coastal resources threatened 2. Undercutting traditional knowledge	1. Direct damage to community structures	1. Lowland inundation, beach erosion	1. Habitat destruction, species loss	1. Coral bleaching, species loss. 2. Habitat destruction	1. Habitat destruction, species loss
Coastal Zone and Human Settlements	1. Lowland inundation 2. Loss of land and infrastructure 3. Threatened livelihoods	1. Habitat destruction. 2. Coral bleaching, species loss 3. Coastal resources threatened	1. Asset loss due to wild fires	1. Human diseases 2. Wetland inundation,, beach erosion, salinisation 3. Pressure on	1. Less local food, incl. associated health issues 2. Asset loss from wild fires.	1. Less local food and related health issues 2. Insect attacks. 3. Pressure on health care and emergency response	1. Less local food, incl. associated health issues 2. Pressure on health care

	4. Pressure on health care and emergency response	4. Undercutting traditional knowledge		health care and emergency response		4. Higher demand for cooling, air conditioning	and emergency response
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Annex 9 Current projects relevant to DRR and CCA in agriculture, forestry, fisheries and water resources

Abbrev	Project Title	Period	Foreign Funding	Who Implements	Outputs/Relevance for agricultural sectors
SPACC	Special Program on Adaptation to Climate Change	2007-2011	GEF/WB	MPDEH (SDE)	North: Institution of revised design hurricane wind speed standards to facilitate enhanced designing, construction and retrofitting in Saint Lucia, for public and commercial buildings in the first instance. South: institution of guidelines for the installation of water conservation systems, as part of the GOSL approval process for all new hotels and other commercial establishments in Saint Lucia.
CADM	Caribbean Disaster Management Project Phase II	2009-2011	JICA	CDEMA, governments	Outputs: (1) Early Warning Systems for the flood hazard established and implemented at the pilot sites, (2) Capability of the Regional team to develop flood hazard maps and to establish flood early warning systems upgraded, (3) Hydrological database is established and functioning at the CIMH
Flood Pilot	Caribbean Flood Pilot	2009-2010		CDEMA, MetService	Addresses all phase of the disaster management cycle. The main warning and response activity is the Sensor Web flood prediction and high resolution satellite data acquisition to increase the resolution of the flood prediction model
CHAMP	Caribbean Hazard Mitigation Capacity Building Program	2007-2010	CIDA	CDERA	Developed flood hazard maps for Saint Lucia
CDM-HIP	Comprehensive Disaster Management Harmonized Implementation Programme	2008-2013	CIDA, DFID	CDEMA/OECS	Providing enhanced institutional support for CDM Programme implementation and enhanced community resilience in CDEMA states.
TCP on DRM	Enhanced capacities for disaster risk mitigation in agriculture, forestry and fisheries	2009-2011	FAO	MALFF	Outputs: (i) Improved capacities of MALFF to systematically review/update and implement national, sectoral risk mitigation policies and provide technical assistance to communities, (ii) Community based risk mitigation approaches for hydro-meteorological hazards promoted and measures identified and tested demonstration activities , (iii) Improved

					capacities for vulnerability mapping and damage assessment, (iv) Communication public awareness programme targeted to farmers and civil society
	Institutional Support and Capacity Building for Disaster Management in the Caribbean Project	2007-2010	EU		Outputs: (i) Review of Existing Disaster Management Model Legislation and Regulation, (ii) Regional Infrastructure for Information Sharing and development and adaptation of Model ICT Contingency Plan, (iii) Development and adaptation of Model Public Education/Awareness Policy and Strategy.
SLMP	Capacity building and Mainstreaming of Sustainable Land Management in Saint Lucia	2007-2010	GEF/UNDP	MPDEH (SLM)	Outputs: (i) SLM mainstreamed into national development strategies/policies, (ii) Capacities for SLM developed, (iii) Awareness on SLM issues and capacities for knowledge management enhanced, (iv) investment planning and resource mobilization for SLM elaborated, (v) national action plan completed; MALFF engaged through UNCCD focal point
IWCAMP	Integrating Watershed and Coastal Area Management in the Small Island Developing States of the Caribbean.	2006-2011	GEF/UNEP/UNDP	MALFF	Demonstration projects in Saint Lucia: (i) Protecting and Valuing Watershed Services and Developing Management Incentives in the Fond D'or Watershed Area of St. Lucia,
	Mainstreaming disaster risk management in OECS member states	2010-2012	IDB/CDB	OECS	Outputs: (i) Conduct of an assessment of community-based disaster risk management in the OECS; (ii) Development and implementation of a methodology for multi-hazard risk reduction in low income communities; (iii) Development of Community Benchmarking Tool (Community B Tool); and (iv) Preparation of a Toolkit to assist target communities to build community resilience to disasters
	My Island – My Community	2010-2013	GEF Small Grant	Media Impact, OECS, TNC, ...	Participating organizations learn to implement Entertainment-Education programs, produce radio programs, mobilize citizens and promote preparedness and community based adaptation to climate change.

Annex 10. Review process:

Participants of 1st stakeholder workshop

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1	Ms. Joanna Rosemond	MPDE	SDE
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The draft final report consolidation by Rufus Leandre (MALFF), Thomas Edmund (national consultant) and Stephan Baas (FAO) based on comments received