Saint Lucia's National Adaptation Plan (NAP) 2018–2028

IMPACT SCIENCE BASED IMPLEMENTATION OF 1.5°C COMPATIBLE CLIMATE ACTION FOR LDC AND SIDS

Japan-Caribbean Climate Change Partnership

From the People of Japan

UNDP

Empowered lives. Resilient nations.

Saint Lucia's National Adaptation Plan (NAP): 2018–2028

Prepared under the guidance of:
Department of Sustainable Development

With the support of:
Government of Japan, through the United Nations Development Programme's Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)

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Government of Germany, through the IMPACT Project.

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Foreword

Saint Lucia's National Adaptation Plan (NAP) has been defined as a ten (10)-year process (2018-2028), consisting of priority cross-sectoral and sectoral adaptation measures for eight key sectors/areas and a segment on the 'limits to adaptation', complemented, incrementally, with Sectoral Adaptation Strategies & Action Plans (SASAPs). Priority sectors for adaptation action include: Tourism; Water; Agriculture; Fisheries; Infrastructure and spatial planning; Natural resource management (terrestrial, coastal and marine); Education; and Health. Other key sectors will be identified through a cyclical, iterative NAP process.

Saint Lucia's NAP process is spearheaded by the Sustainable Development and Environment Division (SDED) of the Department of Sustainable Development, currently housed within the Ministry of Education, Innovation, Gender Relations and Sustainable Development. The NAP process has benefitted from the inputs of multiple stakeholders, comprising public, statutory, academic and private sector bodies. Indeed, this process has involved State and non-State actors, such as media personnel, who play an important role in helping efforts to positively influence thinking, mould outcomes, change behaviour and instigate action across the populace, at all levels.

Saint Lucia's overarching NAP continues to be supplemented by several documents:

- *Saint Lucia's National Adaptation Plan Stocktaking, Climate Risk and Vulnerability Assessment Report*
- *Saint Lucia's National Adaptation Plan Roadmap and Capacity Development Plan 2018-2028*
- *Saint Lucia's Climate Change Communications Strategy*
- *Saint Lucia's Sectoral Adaptation Strategy and Action Plan for the Water Sector (Water SASAP) 2018-2028*
- *Saint Lucia's Sectoral Adaptation Strategy and Action Plan for the Agriculture Sector (Agriculture SASAP) 2018-2028*
- *Saint Lucia's Sectoral Adaptation Strategy and Action Plan for the Fisheries Sector (Fisheries SASAP) 2018-2028*
- *Saint Lucia's Portfolio of Project Concept Notes for the Water Sector 2018-2028*
- *Saint Lucia's Portfolio of Project Concept Notes for the Agriculture Sector 2018-2028*
- *Saint Lucia's Portfolio of Project Concept Notes for the Fisheries Sector 2018-2028*
- *Monitoring and Evaluation Plan of Saint Lucia's National Adaptation Planning Process*
- *Guidelines for the Development of Sectoral Adaptation Strategies and Action Plans: Saint Lucia's experience under its national adaptation planning process*

This process also supported a climate change website, an animated video and training for government entities and journalists in communicating about climate change. A NAP Assembly and Donor Symposium were also all made possible under this process, through the support of several entities.

Specifically, the process has benefited from the financial support of the United Nations Development Programme's (UNDP) Japan- Caribbean Climate Change Partnership (JCCCP). Technical and financial support for Saint Lucia's NAP process has also been provided through the United States (U.S.) In-Country NAP Support Programme (NAP-SP), implemented by the International Institute for

Sustainable Development (IISD). Technical support for the chapter on the 'limits to adaptation' in the NAP was provided under the IMPACT project, funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), as part of the International Climate Initiative (IKI). The IMPACT project is jointly implemented by Climate Analytics, the Caribbean Community Climate Change Centre (CCCCC), Secretariat of the Pacific Regional Environment Programme (SPREP) and Charles and Associates (CAA) Inc. The Department extends its thanks to all of the foregoing and takes this opportunity to recognise the consultant, Ms. Clara Ariza, for her tireless efforts in Saint Lucia's NAP process, under the able guidance of SDED.

Saint Lucia looks forward to forging partnerships and alliances that will assist in developing additional SASAPs and implementing the measures, programmes, projects and activities outlined in its NAP, SASAPs and other support documents. Saint Lucia is prepared to welcome support, that is, finance, technology transfer and capacity building, from a variety of sources, including public, private, bilateral, multilateral and alternative sources, all in an effort to help the country build climate resilience and address the seemingly insurmountable phenomenon of climate change.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF BOXES

EXECUTIVE SUMMARY

Small Island Developing States are particularly threatened by climate change. They face the prospect of partial or total inundation by sea-level rise, more intense tropical storms, increased coastal erosion and saline intrusion, higher air and sea temperatures and more erratic rainfall conditions. These, and other potential impacts, exacerbate current vulnerabilities and pose serious challenges to local ecosystems, livelihoods and economies. In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change emphasises that adaptation and mitigation can be understood as complementary components of islands' response to climate change and that adaptation generates larger benefit to small islands when delivered in conjunction with other development activities.

The island of Saint Lucia is vulnerable to climate change due to three main conditions: (a) its small geographical area, which accounts for the fact that disasters take country-wide proportions; (b) its location in one of the highest-risk areas of the planet. These risks include, high volcanic and seismic activity, being situated in the tropical cyclone belts, and direct exposure to the forces of the oceans; and (c) its dependence on a few sources of income (agriculture and tourism sectors) for a substantial part of its gross domestic product (GDP). These sources of income have already been severely reduced for months on end by single climate-related disasters. Another critical indicator of Saint Lucia's vulnerability is its limited capacity to reactivate the development process after a devastating weather event.[1] The cost of inaction on climate change in Saint Lucia has been calculated to be at 12.1% of GDP by 2025, rising to 24.5% by 2050 and 49.1% by 2100.[2] Recent extreme climate events have highlighted the vulnerability of the country to climate hazards and provided an indication of the additional future costs in failing to prepare for climate change.

The Government of Saint Lucia (GoSL) recognises the challenges that climate change poses to its population, natural resources and economy, and has taken considerable measures to identify and address, to the extent possible, current and future climate risks at the policy and operational level. Today, various sectoral policies address climate change and a wide range of interventions have been designed or established as adaptation measures, often facilitated or supported by international donors.

To facilitate effective mid and long-term climate adaptation planning and to enable the integration of climate change adaptation considerations into all relevant policies and programmes and into development planning, Saint Lucia initiated its National Adaptation Plan (NAP) process in 2017. Through the NAP process, efforts to address critical climate change-related risks and development priorities will take place in an integrated and coordinated manner, utilising existing and future synergies. The NAP process is expected to reduce existing vulnerabilities by building adaptive capacity and resilience in all sectors and at all levels of society.

In general terms, the NAP process, established by the Conference of the Parties to the United Nations Framework Convention on Climate Change, builds on the progress countries have already made in terms of climate change adaptation policy and action. It consists of continuous planning and implementation cycles and implies the iterative assessment of sectoral and cross-sectoral adaptation needs (based on the cyclic assessment of risks, vulnerabilities and capacities), the identification and prioritisation of actions to address those needs (based on accumulated national and international

knowledge and practice), and the implementation of prioritised actions. The NAP process entails strong information management, coordination and communication efforts across sectors and stakeholders, and requires the resources and skills needed to assess, plan, prioritise, coordinate, implement, monitor and review progress. NAP processes are flexible, transparent, country owned and country-driven. The NAP process uses the knowledge acquired during each review cycle to steer and improve the way national adaptation is guided and to tap into emerging policy integration and funding opportunities.

Saint Lucia's NAP has been defined as a 10-year process consisting of a Plan with key cross-sectoral and sectoral adaptation measures presented in this document for 8 sectors/areas (7 sectors/areas prioritised by stakeholders in 2017 and tourism*). The NAP will be complemented with Sectoral Adaptation Strategies and Action Plans (SASAPs) for water, agriculture, fisheries, infrastructure and spatial planning, natural resource management (terrestrial, coastal and marine), education and health sectors/areas, ranked in this order by stakeholders as the sectors that most urgently require adaptation action.* The SASAPs will be elaborated, as funding becomes available and will include detailed priority measures within sector-specific thematic areas and activities, with indicative outputs to support the design of projects for the implementation of the prioritised measures. The NAP and formulated SASAPs contemplate the implementation of priority activities to start in the short-term (2018-2021), medium-term (2021-2024) and long-term (2024-2028), according to their urgency, with short-term being the most urgent.

Saint Lucia's NAP (2018-2028) is therefore the starting point for the implementation of coordinated adaptation action at the national level. The Plan is the product of broad stakeholder consultations, exhaustive literature reviews and planning sessions. It was prepared under the leadership of the Department of Sustainable Development (DSD), at the Ministry of Education, Innovation, Gender Relations and Sustainable Development and with the technical and financial support of the UNDP Japan-Caribbean Climate Change Partnership. A chapter on the 'limits to adaptation' was supported under the IMPACT project, funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), as part of the International Climate Initiative (IKI).**

Concretely, the NAP includes 40 cross-sectoral, and a total of 271 adaptation measures for the 7 sectors/areas prioritised in 2017 and tourism. The measures are deemed critical for strengthening Saint Lucia's capacity to prepare for, withstand and recover from the impacts of climate variability and climate change and for tapping into opportunities to address climate change. The measures, endorsed by relevant stakeholders, offer solutions to information, technical, institutional, financial, regulatory and policy limitations hampering climate change adaptation in the country. In the NAP, the adaptation

* Note that in 2015, prior to the NAP process being officially undertaken in Saint Lucia, the GoSL developed an Impact Assessment and National Adaptation Strategy and Action Plan for the Tourism Sector.

** The IMPACT project is jointly implemented by Climate Analytics, Caribbean Community Climate Change Centre (5Cs), Secretariat of the Pacific Regional Environment Programme (SPREP) and Charles and Associates (CAA) Inc.

measures contribute to the achievement of 13 overarching outcomes and two overarching adaptation goals, namely:

1. To enhance the national enabling environment for climate-related adaptation and risk reduction action within and across development sectors;
2. To accelerate the implementation of climate adaptation and risk reduction actions critical to safeguarding the country's socioeconomic and environmental systems.

The NAP document provides direction on implementation, under the guidance of the multi-agency National Climate Change Committee (NCCC), with the DSD as the Secretariat; funding is expected to be derived from both national and international sources; and implementation is expected to mostly occur through the inclusion and execution of NAP components, future SASAPs and adaptation measures in individual national and regional development and climate change-focused projects and programmes.

Complementing this NAP document is a series of supplementary documents that facilitate the NAP implementation. These include, *inter alia*:

- A NAP stocktaking, climate risk and vulnerability assessment report
- A NAP roadmap and capacity development plan
- A NAP communications strategy
- The SASAPs
- Guidelines for the formulation of SASAPs
- NAP-associated climate adaptation project concept sector portfolios
- The NAP monitoring and evaluation plan

The latter will allow tracking of progress, not only on the implementation of concrete on-the-ground adaptation measures, but also on the process of planning, coordinating and building institutional capacities for aligning and integrating adaptation into development planning. It is expected that the NAP will be reviewed at least once during its first ten-year cycle and that reporting on its implementation will occur yearly.

The NAP targets policy makers, technical officers and managers in all GoSL's ministries and departments. It also targets non-state actors interested in supporting the GoSL's efforts to build climate resilience in the country. This includes regional and international partners and donor agencies interested in making technical and financial contributions for the execution of the adaptation measures. The NAP offers specific guidance to government staff in the priority sectors/areas. However, it is expected and highly recommended that during the NAP's execution, efforts are made for each of the sectors/areas to coordinate with, and collaborate in, climate change and development-related actions led by other sectors or organisations and across different scales. This will allow for identifying synergies, increasing cross-sectoral adaptation benefits and accelerating adaptation. It will also permit identifying and preventing potential detrimental effects that development or adaptation activities undertaken in one sector could have on the adaptation or development efforts of another.

While adaptation is key to reducing risks and impacts of climate change, adaptation cannot prevent all climate change impacts from occurring. Ineffective mitigation at the global level may result in a

number of limits to adaptation for Saint Lucia, including the inability of coastal ecosystems to adapt to increased rates and extent of sea level rise; insufficient financial resources to implement required adaptation strategies; and lack of effective or affordable technology to provide coastal protection from impending sea level rise and extreme events. These limits to adaptation may result in loss and damage-impacts of climate change that occur despite the best mitigation and adaptation efforts. For Saint Lucia, loss and damage may affect all aspects of life, including loss of territory, damages to critical infrastructure, loss of income and livelihoods, decreased worker productivity and displacement and migration of communities. Comprehensive climate risk management is aimed at addressing loss and damage through strengthening the resilience of vulnerable people, communities and nations, including mechanisms, for coping with impacts that cannot be avoided. Key actions for risk assessment, reduction, transfer and retention that Saint Lucia may wish to pursue are highlighted and include hazard mapping, early warning systems and continued engagement in regional risk pooling, livelihood protection policies and insurance platforms.

ACRONYMS

5Cs	Caribbean Community Climate Change Centre
AOSIS	Alliance of Small Island States
CAF	Cancun Adaptation Framework
CARPHA	Caribbean Public Health Agency
CBO	Community-Based Organisations
CCA	Climate Change Adaptation
CCAP	Climate Change Adaptation Policy
CIF	Climate Investment Funds
COP	Conference of the Parties
CPACC	Caribbean Planning for Adaptation to Climate Change
CRA	Climate Resilient Agriculture
CRM	Climate Risk Management
CUBiC	Caribbean Uniform Building Code
DOF	Department of Fisheries
DPS	Deputy Permanent Secretary
DSD	Department of Sustainable Development
DVRP	Disaster Vulnerability Reduction Project
EbA	Ecosystem-based Adaptation
EC	European Commission
ECLAC	Economic Commission for Latin America and the Caribbean
EIA	Environmental Impact Assessment
GCF	Green Climate Fund
GCM	General Circulation Models
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Global Greenhouse Gas
GIS	Geographic Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoSL	Government of Saint Lucia
ICT	Information and Communications Technology
INDC	Intended Nationally Determined Contribution
IPCC	Inter-government Panel on Climate Change
J-CCCP	Japan-Caribbean Climate Change Partnership
KAP	Knowledge, Attitude and Practice
LEG	Least Developed Countries Expert Group
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreement
MTDS	Medium-Term Development Strategy
NAP	National Adaptation Plan
NAP-GN	National Adaptation Plan Global Network
NCCC	National Climate Change Committee
NEMO	National Emergency Management Organisation
PPCR	Pilot Programme for Climate Resilience
PS	Permanent Secretary
RCM	Regional Climate Model
RWH	Rain Water Harvesting

RSO	Research and Systematic Observations
SASAP	Sectoral Adaptation Strategy and Action Plan
SDED	Sustainable Development and Environment Division
SIDS	Small Island Developing States
SLASPA	Saint Lucia Air and Sea Ports Authority
SLR	Sea Level Rise
SMMA	Soufriere Marine Management Area (or Association)
SOER	State of the Environment Report
SPCR	Strategic Programme for Climate Resilience
SWOT	Strengths, Weaknesses, Opportunities and Threats
TNC	Third National Communication
UN	United Nations
UNDP	United Nations Development Programme
UWI	University of the West Indies
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars
V&A	Vulnerability and Adaptation
WASCO	Water and Sewerage Company Inc.
WRMA	Water Resources Management Agency

INTRODUCTION

Climate change has been identified as one of the greatest challenges of our generation. Global Greenhouse Gas (GHG) emissions due to human activities have reached their highest levels in recent years and influence unprecedented changes, including the warming of the atmosphere and oceans, the reduction in snow and ice amounts at high altitudes and the rise in sea level. As temperatures continue to increase, it is expected that the multiple and interconnected impacts of climate change, many of which are already felt across the globe, will intensify. This will disproportionately affect the poor, jeopardise development achievements and increase the costs of development.

Small Island Developing States (SIDS) are particularly threatened by climate change. They face the prospect of partial or total inundation by sea-level rise, more frequent and intense tropical storms, increased coastal erosion and saline intrusion, higher air and sea temperatures and more erratic rainfall conditions. These, and other potential impacts, exacerbate current vulnerabilities and limit their capacity to grow and sustainably develop.

In its Fifth Assessment Report (AR5), the Intergovernmental Panel on Climate Change (IPCC) emphasises that adaptation and mitigation can be understood as complementary components of islands' response to climate change; that adaptation generates a larger benefit to small islands when delivered in conjunction with other development activities; and that the ability of small islands to undertake adaptation and mitigation programmes, and their effectiveness, can be substantially strengthened through appropriate assistance from the international community.

The Government of Saint Lucia (GoSL) recognises the challenges that climate change poses to its population, natural resources and economy, and has taken considerable measures to identify and address, to the extent possible, current and future climate risks at the policy and operational level. Today, various sectoral policies address climate change and a wide range of interventions have been designed or established as adaptation measures, often facilitated or supported by international donors.

To facilitate the integration of climate change adaptation considerations into relevant policies and programmes and into development planning, Saint Lucia engaged, in 2017, in its National Adaptation Plan (NAP) process, under the leadership of the Department of Sustainable Development (DSD), based within the Ministry of Education, Innovation, Gender Relations and Sustainable Development.* Through the NAP process, efforts to address critical climate change-related risks and development priorities will take place in an integrated and coordinated manner, utilising existing and future synergies. The NAP process is expected to reduce existing vulnerabilities by building adaptive capacity and resilience in all sectors and at all levels of society.

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* Technical and financial support for the NAP was provided through the United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP). A chapter on the 'limits to adaptation' was also supported under the IMPACT project, funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), as part of the International Climate Initiative (IKI). The IMPACT project is jointly implemented by Climate Analytics, 5Cs, Secretariat of the Pacific Regional Environment Programme (SPREP) and Charles and Associates (CAA) Inc.

The **first section** of this document sets the national context for the NAP. The **second section** provides an overview of Saint Lucia's current climate, recent climate trends, climate change projections and potential impacts of climate change in key development sectors. The NAP process is introduced in the **third section.** The expected function of the NAP, the audience the NAP addresses, the NAP vision and the expected impact and goals are delineated in the **fourth section**, along with the strategy, scope, institutional arrangements established for the implementation of the NAP, as well as funding provisions. The Plan itself starts in the **fifth section**, which includes a sub-section on the identified cross-sectoral national adaptation priorities. Sectoral adaptation priorities for the 7 sectors/areas of focus and tourism are delineated in the **sixth to the fourteenth sections**. The **fifteenth section** is on the "limits to adaptation".

Complementing this NAP document is a series of associated documents that facilitate the NAP implementation. These include, *inter alia*:

- A NAP stocktaking, climate risk and vulnerability assessment report[3]
- A NAP roadmap and capacity development plan[4]
- A NAP communications strategy[5]
- The SASAPs
- Guidelines for the formulation of SASAPs[6]
- NAP-associated climate adaptation project concept sector portfolios
- The NAP monitoring and evaluation plan

1. NATIONAL CONTEXT

1.1. COUNTRY FEATURES

GEOGRAPHY

The Small Island Developing State (SIDS) of Saint Lucia is located within the Lesser Antillean Arc of the Caribbean Archipelago, at 13°59'N, 61°W. It sits on an ancient volcanic ridge that connects Martinique to the north and Saint Vincent and the Grenadines to the south. The island has a land area of approximately 616 km^2, it is 42 km long and, at its widest point, it is 22 km wide. Its extensive coastline has a length of approximately 158 km, with a coastal shelf area of 522 km^2 that is relatively narrow and drops off sharply along the west coast. Saint Lucia has a very rugged landscape, characterised by mountains along a centrally located north-south oriented mountain range, deep valleys and rivers. Mount Gimie, reaching an elevation of 950 m, is the island's highest peak. [7,8]

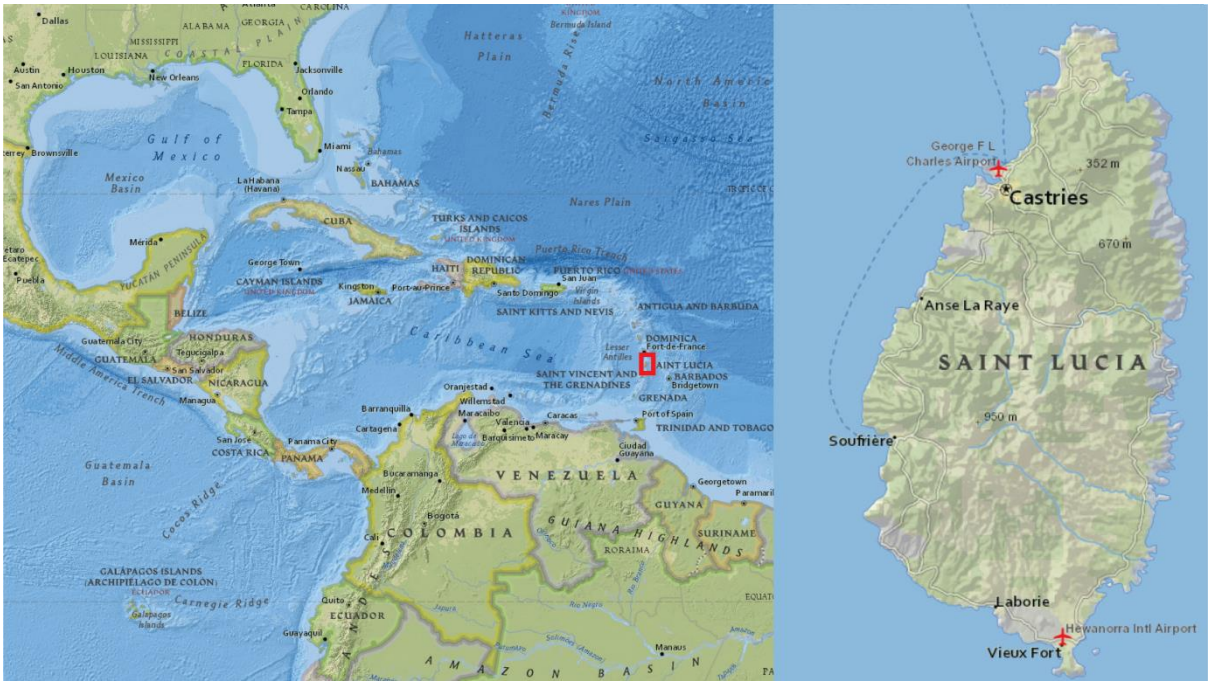

Figure 1. Geographic location of Saint Lucia

POPULATION

In 2015, the estimated population of Saint Lucia stood at 172,623 and was relatively young, with 46.9% of the population under 30 years of age and 12.6% sixty years old or older. Women make 50.6% of the population. Life expectancy has increased since 2007, standing in 2012, at 75.3 years for men and 82.1 for women.[7]

Most of the country's population is located along the coastal belt, where lowland agriculture, coastal resources, reefs, fisheries and tourism are the main livelihood sources. Approximately 41% of the total

population lives in the city of Castries and 55% in the Castries-Gros Islet corridor. Urbanisation is rapidly occurring, resulting in denser populations living in unplanned or informal settlements.[9]

Poverty in Saint Lucia has traditionally been a rural phenomenon. The 2010 census reported poverty rates of over 35% in the rural districts of the south and south west of the island, and pockets of poverty in the north-east region. Over 50% of the poor were under the age of twenty; the incidence of poverty was higher among children than among adults and it was slightly higher among men than among women - 29% and 25% respectively -.[10] While about one third of the population is considered economically active, unemployment rates are high (24% in 2015).[11] Of the economically active population, 53% is employed in the services sector (tourism and other services); 22% are employed in agriculture and 25% in manufacturing.[11] In 2010, over 40% of households in Saint Lucia are headed by women.[10]

ECONOMY

Over the past two decades, with the active promotion of tourism, the traditionally agrarian-based economy of Saint Lucia shifted towards a service-based economy and tourism replaced the production of bananas for export as the island's number one foreign income earner. Manufacturing and industrial production in the country concentrate on the food and beverages, paper and paper board products, metal products and chemicals subsectors. Despite rising operating costs, the island's manufacturing and industry have remained as important productive sectors. The construction sector has also made major contributions to GDP and employment.[9] **Figure 2** shows the contribution of the different economic sectors to the country's GDP in 2015.

With a fairly liberal trade regime, Saint Lucia is a net importer of manufactured goods and also a net importer of food, with a growing trade deficit in its food bill.[7] In addition, the country relies almost exclusively on imported fossil fuels to meet its energy needs.[12]

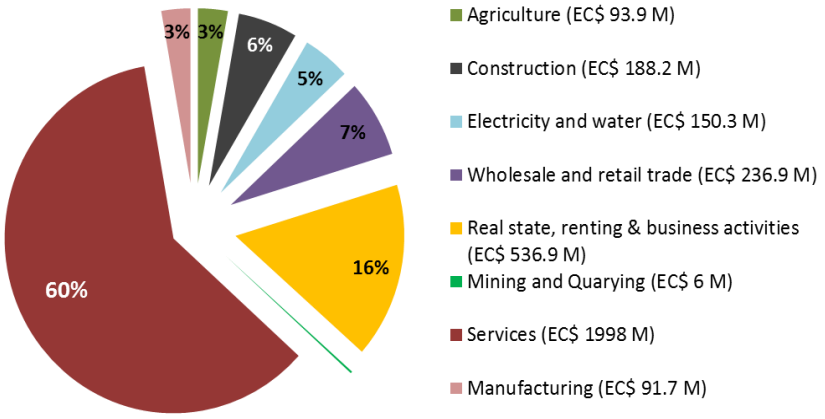

Figure 2. Sectoral contribution to Saint Lucia's GDP in 2015
Source: GoSL 2015.[11]

2. CLIMATE CHANGE IN SAINT LUCIA

Small Island Developing States are particularly threatened by climate change. They face the prospect of partial or total inundation by sea-level rise, more frequent and intense tropical storms, increased coastal erosion and saline intrusion, higher air and sea temperatures and more erratic rainfall conditions. These, and other potential impacts, exacerbate current vulnerabilities and pose serious challenges to local ecosystems, livelihoods and economies. In its Fifth Assessment Report (AR5), the Intergovernmental Panel on Climate Change (IPCC) emphasises that adaptation and mitigation can be understood as complementary components of the islands' response to climate change and that adaptation generates a greater benefit to small islands when delivered in conjunction with other development activities.

As recognised in Saint Lucia's CCAP, the country is vulnerable to climate change due to three main conditions: (a) its small geographical area, which accounts for the fact that disasters take on country-wide proportions; (b) its location in one of the highest-risk areas of the planet. These risks include, high volcanic and seismic activity, being situated in the tropical cyclone belts, and direct exposure to the forces of the oceans; and (c) its dependence on few sources of income (the agriculture and tourism sectors) for a substantial part of its GDP. These sources of income have been severely reduced for months on end by single climate-related disasters. Another critical indicator of Saint Lucia's vulnerability, is its limited capacity to reactivate the development process after a devastating weather event.[1] There are other non-climatic factors that may contribute to the country's vulnerability and exacerbate the adverse effects of climate change, including, *inter alia*, issues pertaining to building codes, agriculture practices, chemicals and waste management, public awareness and sensitisation, planning and development and unemployment and poverty.

The cost of inaction on climate change in Saint Lucia has been calculated to be at 12.1% of GDP by 2025, rising to 24.5% by 2050 and 49.1% by 2100.[2] Recent extreme climate events have highlighted the vulnerability of the island to climate hazards and provided an indication of the additional costs that failing to prepare for climate change could represent to Saint Lucia in the future. For example, the impact of Hurricane Tomas (2010) had a total cost of 43.4% of the island's GDP.[1] It caused a total estimated USD 336 million in damages to housing, infrastructure and economic sectors, mainly agriculture and tourism, and claimed seven lives. Also, in 2013, an unseasonal low-level trough system passed over the island and produced greater than 224 mm of rainfall in a matter of two to three hours. The system impacted 2,600 persons directly, killed 6, destroyed 47 homes and caused USD 89.2 million in damages. Additionally, Saint Lucia has experienced drought conditions each year since 2012, resulting from a decline in both the total annual and temporal distribution of rainfall. The entire island has been periodically placed on water rationing.[7]

To facilitate the understanding of the climate challenges Saint Lucia can expect in the coming decades, the following sections present the country's current climate conditions, observed regional climate trends and future climate projections.

2.1. CURRENT CLIMATE

Saint Lucia lies within the north-east Trade Winds belt and is normally under an easterly flow of moist, warm air. Its climate is tropical maritime, and due to its location in the Atlantic Ocean/Caribbean Sea, the sea surface temperatures vary little from 26.7°C at any time.[7]

Annually, the island's climate is influenced by the migration of the north Atlantic subtropical high, the eastward spread of the tropical Atlantic warm pool, the fairly steady easterly trade winds, and the passage of tropical waves, depressions, storms and hurricanes. El Niño Southern Oscillation (ENSO) is a major driver of inter-annual variability in climate conditions, with its warming phase (El Niño) bringing warmer and drier than average conditions during the late wet-season and its cooling phase (La Niña) causing colder and wetter conditions during the same period.[13]

Temperature: Due to the size and position of the country, the air temperature is strongly influenced by the winds originating from the surrounding seas and varies little along the year (~28 °C on average).[14] However, diurnal temperatures can vary by as much as 10 °C. The coldest period is December to March, and the warmest between June and September. The mean maximum temperature is about 30.2°C and mean minimum is about 24.6 °C. The island's mountainous topography, particularly in the more rugged interior, can also cause temperature variation between high and low-lying regions of between 2 °C and 5 °C.[13]

Rainfall: A unimodal rainfall regime characterises Saint Lucia. There is one dry season from January to May and one main rainy season from July to November; which receives approximately 60% of the total yearly rainfall. Precipitation records from the two major airports indicate that the island receives an annual average of 1,450 mm of rain in the south to 1,900 mm of rain in the north.[13] Also, across the country, annual rainfall shifts from 1,265 mm in the relatively flat coastal regions to about 3,420 mm in the elevated interior region.[7]

Winds: Wind speeds are highest, on average, during the months of January to July, corresponding roughly with the dry season, when the average is 24km/h. Between August and December, the speeds average 16km/h. Higher gusts are occasionally experienced with the passage of tropical disturbances.[7]

Humidity: On average, the relative humidity is around 77% (measured at the Hewanorra airport station). Daily variation in relative humidity is at a maximum during the warmer months.[7]

Sunshine: Saint Lucia receives the maximum daily sunshine from February to May and the minimum, around September. Due to cloud cover, radiation values vary widely over the island. Elevated regions with greater cloud cover, receive less direct radiation than the low-lying coastal regions.[7]

2.2. RECENT REGIONAL TRENDS

Between 1961 and 2010, a significant warming of the Caribbean region's surface air temperature was recorded, with the night-time temperature increasing more than the daytime temperature. Warm days, warm nights and extreme high temperatures became more frequent, while the frequency of cool days, cool nights and extreme low temperatures reduced. Precipitation trends are less consistent. While no significant change in annual total precipitation was detected between 1961 and 2010, a trend of increasing intensity in daily rainfall and heavier rainfall events was detected.[15]

It has been estimated that global sea level rise has occurred at a rate of 1.7 ± 0.2 mm per year between 1901 and 2010 but has accelerated since the 1900s; with the 1993-2010 period presenting a rate of 3.2 ± 0.4 mm/year (very likely).[16] Between 1950 and 2000, sea level rise in the Caribbean region was estimated to near the global mean.[13]

2.3. FUTURE CLIMATE

Several studies have developed climate change projections for Saint Lucia in recent years (see **Box 1**). While using different models, emission scenarios, baseline periods and projection periods**, all projections indicate general trends of increasing mean annual temperatures and decreasing precipitation amounts with climate change in Saint Lucia.**[7,13, 17]

Box 1. Climate models developed for Saint Lucia

In the National Adaptation Strategy and Action Plan for the Tourism Sector (2015),[13] the 5Cs and the GoSL present the results of statistical and dynamic downscaling approaches using SRES scenarios (and where possible or available, the IPCC's RCP4.5) for projecting Saint Lucia's temperature and rainfall in the 2031-2040 and 2051-2100 periods relative to the 1961-1990 baseline.

The Third National Communication to the UNFCCC (2017)[7] presents projections of temperature, precipitation and water excess and deficits (P-E) for the 2040-2069 and 2081-2100 periods relative to the 1981-2015 baseline. The projections were obtained using PRECIS-downscaled scenarios of two climate models (HadCM3 and ECHAM5) and one SRES scenario.

In 2012, the CARIBSAVE Partnership published *Climate Change Risk Profile for Saint Lucia*[17] the most comprehensive climate change projections for Saint Lucia to date. This study generated climate model projections of future scenarios using both a Global Climate Model (GCM) ensemble of 15 models and the Regional Climate Model (RCM), PRECIS downscaled. The RCM was used to provide projections at a finer spatial scale (and thus give a better physical representation of the local climate) than GCMs.

For the sake of simplicity, the results of the climate projections produced by CARIBSAVE (2012)[17] for a high emissions scenario (Special Report on Emission Scenarios SRES A2) and relative to the 1979-2009 period, summarised below, indicate that the following could be expected in Saint Lucia:

Mean annual temperature increases in the order of:
0.3 to 0.8 ˚C by 2020; 0.9 to 1.7 ˚C by 2050 and 1.8 to 3.1 ˚C by 2080 (Global Circulation Model, GCM).
2.4 to 3.3 ˚C by 2080 (Regional Climate Model, RCM).

The frequency of hot days increases between 38 and 54% by 2050 and between 55 and 97% by 2080 (GCM).

The frequency of hot nights increases between 38 and 67% by 2050 and between 55 and 97% by 2080 (GCM).

Cold days and cold nights do not occur at all by 2050 and 2080 according to the GCM models.

Annual precipitation decreases in the order of:
-15 to 4mm by 2020; -19 to 4mm by 2050 and -37 to 6mm by 2080 (GCM).
-11% to -32% by 2080 (RCM).

Sea Surface Temperature increases by 0.8 to 3˚C by 2080s (GCM).

Wind speed increases by 2080 by up to 0.5 m/s (GCM); by up to 0.7 m/s (RCM)

The number of sunshine hours per day increases by roughly one hour by 2080 (RCM) due to a reduction in average cloud fraction.

Tropical storms and hurricanes become more intense, but not necessarily more frequent. North Atlantic hurricanes and tropical storms appear to have increased in intensity over the last 30 years. Observed and projected increases in sea surface temperatures indicate potential for continuing increases in hurricane activity and model projections indicate that this may occur through increases in intensity of events, but not necessarily through increases in frequency of storms.

The proportion of total rainfall that falls in heavy events decreases, changing by -25% to +2% by the 2080s (GCM).

The rate of **sea level rise** is difficult to calculate as new evidence suggests that the contribution of ice sheet melting to global sea level rise will be greater than considered in IPCC projections. This increases the range of potential mean sea level rise in the Caribbean from 0.18-0.56m (IPCC for an SRES A2 scenario) **to up to 1.45m by 2100,**[18] relative to the 1989-1999 baseline. It has been established that in the northern Caribbean, sea level rise could be 25% higher than the global average due to physical factors affecting land elevation.[19]

The high level of uncertainty in sea level rise and hurricane intensity creates difficulties in estimating future changes in storm surge height or frequency.

2.4. EXPECTED IMPACTS OF CLIMATE CHANGE

Recent extreme weather events and their consequences are indicative of the challenges that climate change will pose on Saint Lucia in the next decades, albeit if GHG emissions would be reduced to an absolute minimum, global temperatures will still rise due to the thermal inertia of the world's oceans.

By signing the Paris Agreement in 2015, the international community committed to accelerate efforts to limiting the global temperature rise to below 2°C above pre-industrial levels (and attempt at not overcoming the 1.5°C limit called for SIDS and many other countries). Reaching these targets would avoid the most catastrophic impacts of climate change; however, understanding that at least some level of warming is inevitable, the signatory countries, including Saint Lucia, also recognise the need to scale-up adaptation efforts, -with requisite support to developing countries to do so, for strengthening society's ability to deal with the impacts of climate change. Essential for planning and implementing effective national, subnational and sectoral adaptation action is the knowledge and understanding of expected impacts and their cascading effects.

Under a changing climate, Saint Lucia could see its freshwater resources dwindle; suffer from the effects of more intense floods and from a higher incidence of water, food and vector-borne diseases (such as dengue). It is expected that the country's terrestrial and marine ecosystems and biodiversity will see changes in habitat conditions and species will be lost. Some visible examples will be extensive coral bleaching and the loss of turtle nesting sites. Additionally, coastal erosion, more frequent landslides, and flooding from intense seasonal rains and hurricanes will test the resilience of the island's infrastructure and livelihoods. The following tables summarise, although not exhaustively, potential climate change impacts in key development sectors.

Table 1. Potential climate change impacts on Saint Lucia's **water** resources and services

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Reduced water availability affecting all development sectors in the country. • Increased cost of treating and supplying potable water. • Increased cost of maintaining water infrastructure. • Increased risk of conflict over the use of water resources • Declining health (and biodiversity) of freshwater and marine ecosystems, including coral reefs, with
• Increased risk of flooding	
• Destruction or damage of water intakes, dams, reservoirs during extreme weather events, leaving settlements without water or with poor water quality.	
• Increased soil erosion and surface run off on exposed soil leading to: siltation of river systems, dams and reservoirs (resulting in reduced dam capacity).	
• Reduced effectiveness of drainage infrastructure (increasing risk of flooding in low-lying coastal areas) • Increased risk of contamination of water sources from leaching of pit latrines, septic tanks and pig farms in rural areas into flood plains increases during flooding episodes. • Increased risk of agro-chemical contamination of water sources from increased runoff -and erosion- of farming areas. • Poor operational performance of inundated municipal and household septic systems contaminating drainage and water supplies. • Freshwater and marine ecosystems and biodiversity increasingly affected by heightened sedimentation and leaching of organic matter and agro-chemical during strong rainfall events. This would increasingly affect coral reefs, mangrove systems and fisheries.	

Impacts	Repercussions
• Increased risk of water-borne and vector-borne disease outbreaks with flooding.	increasing water pollution. • Increased sedimentation and pollution with agrochemicals leaching during strong rainfall events; more frequent flooding and water shortages, water-borne disease outbreaks and reduced marine life could negatively affect the tourism appeal of Saint Lucia.
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
Reduced availability of freshwater resources due to long dry periods and reduced annual precipitation	
Higher temperatures and longer heatwaves leading to: • Increased water consumption • Increased municipal demand for freshwater	
Increased evapotranspiration leading to: • Higher demand and abstraction of water for agriculture (irrigation and livestock)	
Sea level rise impacts	
• Intrusion of seawater into freshwater lenses, particularly in low-lying coastal areas, further reducing the availability and quality of freshwater. • Irrigation with increasingly brackish water reducing crop production and salinising soils, affecting food security and quality.	

Table 2. Potential climate change impacts on Saint Lucia's **agriculture** sector

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Decreased food availability and security. • Dislocation of food supply. • Reduction in exports of traditional agricultural products. • Loss of farmers' income. • Weakened farming livelihoods • Increasing rural unemployment.
• Widespread crop damage and destruction. • Reduced crop yields • Production, harvesting and post-harvesting operations affected.	
• Livestock losses. Poultry and small ruminants suffer more extensively and may succumb to the battering of high winds, intense wetting, and drowning.	
• Intense rains and flooding reduced drainage capacity giving rise to waterlogging and saline/sodic soil conditions. • Increased landslide risk.	
• Property losses. • Destruction of or damage to agriculture-related infrastructure (irrigation systems, feeder roads, etc.).	
• Loss of agricultural land: in low lying areas primarily because of flooding; and in slopes because of landslides.	
• Increased soil erosion with intense rainfall and runoff, particularly after dry periods, leading to: • Soil nutrient losses and yield declines. • Siltation and contamination of water courses (with residual agrochemicals).	

Impacts	Repercussions
• Interruption of potable water supplies.	
• Decreased reliability of traditional planting and harvesting schedules based on weather patterns.	• Decline in human and animal health due to reduced food availability/shortages
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Hot, dry conditions causing heat stress on plants, retarding growth and development and potentially shortening life cycles (earlier senescence), all affecting productivity and yields	• Higher cost of living due to food imports.
• Increased demand of water for irrigation to compensate higher evapotranspiration losses and maintain yields (this will vary with crop stage) • Increased water abstraction for irrigation	• Increasing rural-urban migration.
• Crop losses with increase pest infestation and disease outbreaks. • Increased incidence or introduction of new agricultural pests.	• Abandoned and lost agricultural lands.
• Changes in soil fertility (e.g. soil organic matter content). • Loss of soil nitrogen due to high ambient temperatures, while there is a chance of increased storage of nitrogen as nitrates in soils provide higher fertilising elements for plants. • Diminished land quality from poor soil conditions. • Changes (increase) in agriculture input use (fertiliser and pesticides), increasing the risk of soil salinisation and water contamination.	
• Significant increase in both external and internal livestock parasites • Predisposition to, an increase in, livestock disease. • Reduced livestock fertility and reproductive rates. • Late maturation of livestock offspring and increase in calf mortality. • Reduction in livestock bodyweight.	
• Decreased productivity of farm labour	
Sea level rise impacts	
• Inundation of coastal land areas leading to high (saline) water tables. • Reduced drainage capacity in low lying areas. • Increased soil salinity due to both, high saline water tables in low lying areas and to increased salinity of river water (due to seawater intrusion into coastal rivers). • Elevated soil salinity levels could lead to the marginalisation, loss and abandonment of agricultural land in low lying areas. • Decline in soil productivity and land quality. • Reduction of crop yields due to both salinised soils and irrigation with brackish water. • Reduction of livestock production with reduced pastures and higher water salinity levels. • Decline in the quality of crop and livestock products. • Increased need for freshwater for irrigation to flush out soil salinity. • Increased cost of production due to increased pressure/competing demands for available water supply.	

Table 3. Potential climate change impacts on Saint Lucia's **fisheries and aquaculture**.

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Loss of fish habitat and of fish stock • Loss of income and livelihoods • Increased dependency on foreign imports • Loss of cultural tradition • Reduced food security
• Heavy siltation caused by exacerbated erosion during intense rainfall events damages coral reefs, affecting their role as fish nurseries and breeding habitats and also as natural barriers that protect coastal areas and their communities against hurricanes and storm surges.	
• Damage and loss of vessels and fishing gear and on shore infrastructure.	

• Port operations affected by:
  • adverse wave conditions resulting in port closures, undesirable port conditions for vessels, loading of mooring lines; damage to vessels
  • siltation resulting from the increasing amount of sediment washed to the sea during heavy rainfall events
  • debris reaching the sea after extreme events
  • Increasing costs. Dredging of marinas will become more costly and frequent as sedimentation (due to soil erosion) increases	

• Freshwater and marine ecosystems and biodiversity increasingly affected by pollution (agro-chemical leaching from soils, and solid waste washed during heavy rainfall events), damaging fish nursery and breeding habitats.	
• Increased number of days at sea lost to bad weather and increased risk of accidents for fisherfolk. • Commercial and recreational fishing vessels also face less safe conditions and the increased risk of structural damage. • Increased risk of damage to fisheries complex amenities and port facilities.	
• Freshwater farms damaged or flooded.	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Migration of various fish and shellfish species from temperate latitudes towards the poles as the environmental conditions they are adapted to change.	
• Warmer sea temperatures could induce changes in fisheries species diversity (with some species migrating in search of cooler waters, and others disappearing) and increase variability in fisheries yields.	
• Warmer sea temperatures and increasing ocean acidity could induce coral bleaching, decreasing the productivity of coral reefs and their associated ecosystems.	
• Drought and warmer temperatures could negatively affect the production of the components used in fish feed, affecting the cost of aquaculture activities. • Aquaculture and irrigated agriculture could compete for scarce water resources with warmer temperatures and prolonged drought periods.	
• Warmer temperatures could affect the growth and development of culture fish • Warmer temperatures could increase the incidence, and facilitate the appearance of, new diseases and parasites and affect aquaculture.	
Sea level rise impacts	
• Shoreline fishing communities and infrastructure are highly vulnerable.	
• Loss of coastal fish breeding and nursery habitats if mangroves are lost due to sea level rise.	

Impacts	Repercussions
• Inundation of low lying areas with possible loss of communities, property, utilities, infrastructure, manmade and natural resources. • Higher tides and breaking of waves further inshore.	

Table 4. Potential climate change impacts on Saint Lucia's **health** sector

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Increased stress on public health care systems. • Increased health care cost. • Decreased productivity (labour, school children, etc.).
• Injuries and deaths resulting from direct hazard impacts on people (e.g. drowning during flooding and from infrastructure or trees striking people) during extreme events.	
• Outbreaks of water-borne and food-borne diseases, such as schistosomiasis and cholera, dengue, leptospirosis and yellow fever, after flooding events.	
• Increased pollution of water sources (sewage, solid waste, industrial/ hazardous chemicals/ waste) during flooding episodes could increase the incidence of skin, gastric and multiple other problems associated with the contamination of water and food supplies.	
• Increased levels of malnutrition due to extreme weather events-related declining crop and livestock production, loss of primary incomes and increasing food costs.	
• Higher levels of human exposure to pesticides (including in food content) due to their increased use to control pest infestation after extreme events.	
• Severed access to health services for vulnerable communities during and in the aftermath of extreme weather events (either because transport and communication is cut or because the events directly affect exposed health system infrastructure).	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Heat stress and cardio- and cerebrovascular conditions resulting from extreme temperature are likely to increase.	
• Higher temperatures associated with heat waves could alter the geographical distribution of the mosquito species that transmit deadly diseases such as dengue.	
• Aggravated respiratory conditions due to increased air pollution from forest and bushfires during dry and hot periods. • Increased concentration of dust and agro-chemical particles transported by wind during dry periods could also exacerbate respiratory problems and cause allergic reactions among other complications.	
• Declining crop yields and livestock production with higher temperatures and dry periods are expected to add to the malnutrition burden in the country.	

Table 5. Potential climate change impacts on Saint Lucia's **infrastructure and spatial planning** sector.

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Increased risk of deaths and injuries. • Loss of income and livelihoods resulting from damage and loss of commercial property and critical coastal infrastructure (e.g. ports, hotels, and utilities). • Reduced productivity and loss of income due to interruptions in the provision of services (telecommunications, power supply, water supply and sanitation) • Relocation of critical infrastructure and communities, and associated costs and problems related to limited suitable areas. • Increased cost of coastal protection and remediation. • Increased costs of relocating, replacing and/or repairing infrastructure, which has been destroyed, dislocated or damaged. • Increased cost of construction resulting from more stringent building codes and the enforcement of planning regulations • Higher infrastructure maintenance costs.
• Damage or destruction of critical infrastructure (such as coastal roads and bridges) and utilities, with the consequent disruption of multiple economic, social and cultural activities. • Damage to and/or loss of coastal property, including housing stock. • Damage of natural defences (mangroves, coral reefs) with high winds, more intense tropical storms and increasing pollution derived from land sources during flooding and heavy rain events.	
• Interruptions in the provision of services relating to telecommunications, electrical power, water supply, sanitation, transport during and in the aftermath of extreme events, flooding and landslides, leading to halted or reduced commerce and other economic activities.	
• Reduced effectiveness of drainage infrastructure and bridges, increasing risk of flooding, damages and losses in low-lying coastal areas.	
• Increased likelihood of landslides on poorly drained or cleared slopes, further threatening property and life. • Landslides resulting in clogging of drainage infrastructure could further exacerbate flooding.	
• Dislocation of coastal communities.	
• Loss/reduced utility of recreational facilities.	

• Port operations affected by:
  • adverse wave conditions resulting in port closures, undesirable port conditions for vessels, loading of mooring lines; damage to vessels;
  • siltation resulting from the increasing amount of sediments washed to the sea during heavy rainfall events;
  • debris reaching the sea after extreme events.
• Dredging of marinas will become more costly and frequent as sedimentation (due to soil erosion) increases.	

• Increased coastal erosion.	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Water supply infrastructure no longer performing to design standards / design requirements, decreasing its effectiveness • Demand for water increases, further adding pressure on water supply and wastewater treatment infrastructure and services.	
• Increased demand for cooling systems and energy for their function.	
• Increased risk of damage to over ground infrastructure in the vicinity of wildfires	
Sea level rise impacts	
• Inundation of low lying areas with possible loss of communities, property, utilities, infrastructure, manmade and natural resources. • Higher tides and breaking of waves further inshore.	

Impacts	Repercussions
• Poor operational performance of inundated municipal and household septic systems, contaminating drainage and water supplies. • Reduced capacity/ performance of drainage infrastructure and bridges, increasing the risk of flooding in low lying coastal areas. • Increased seawater intrusion into coastal rivers affecting water quality and challenging water treatment and potable water supply services.	• Increased cost of insuring property high-risk locations. • Increased vulnerability for populations without appropriate housing. • Disincentive to invest in tourism and other types of coastal development. • Potential migration and land use change, adding pressure on inland forest reserves to provide land for various uses as coastal land is lost to erosion and inundation. • Decline in social and economic development as scarce developmental resources (financial, human, equipment) would need to be diverted from national development and critical infrastructure maintenance to hazard and emergency response and recovery efforts.
• Reduced efficiency of operation of sea ports and other commercial and recreational coastal activities.	
• Loss of quality (and recreational value) and carrying capacity of beaches, a major tourism product and highly valued and used by Saint Lucians. • Diminished property value as a result of declining amenity value.	

Table 6. Potential climate change impacts on Saint Lucia's **natural resources (terrestrial, coastal and marine).**

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• The resilience of Saint Lucia's natural ecosystems could be exceeded with the direct and indirect impacts of climate
• Destruction and damage of unique terrestrial animal and plant habitats due to the direct impact of extreme weather.	
• Increased susceptibility of forest trees to breakage.	
• Damaged and destroyed coral reefs and mangroves due to:	

Impacts	Repercussions
• the impact of high wind speeds and large waves during tropical storms/hurricanes • increased sedimentation/siltation resulting from heavy rainfall (exacerbating soil erosion) inland • contamination from industrial, domestic and farming activities reaching the sea (particularly during flooding and heavy rain events). • Declining integrity and health of coral reefs and mangroves will also lead to: • Loss of fish nurseries and breeding grounds. • Reduced protection against extreme winds and storm surges as these ecosystems act as coastal defences for the pro land-based resources, communities and infrastructure.	change. Any decline in the health of the island's Ecosystems will affect the goods and services that they offer, and have a profound effect on the wellbeing, livelihoods and economy of Saint Lucians. Freshwater, clean air, fertile and stable soils, healthy fisheries, native forest foods, medicines and fibres and wildlife, all depend on healthy ecosystems. Changes in these services could lead to: • Increased health care costs. • Increased exposure to hydrometeorological hazards and risk of disasters. • Loss of land productivity and nutrient cycling (and agricultural yields). • Reduced climate change adaptation and mitigation options. • Loss of biodiversity and biodiversity-dependent activities (e.g. fishing, honey production, eco-tourism).
• Exacerbated soil erosion resulting in increased sediment loads reaching watercourses and the sea, carrying agro-chemical residues and other pollutants. • Higher risk of algal blooms with increasing amounts of nutrients reaching the sea due to both agro-chemical residues leaching during intense rains and to the overflow of sewage and greywater during flood events-.	
• Increased risk of land slippage, particularly in areas with highly altered ecosystem structure, including those denuded of vegetation.	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Changes in ecosystem composition and structure take place as temperature rises and species migrate in search of the climate conditions to which they are adapted. • Species distributions will change, and some species will be lost.	
• Increased risk of forest fires, damaging ecosystems during long dry periods and further weakening their ability to recover.	
• Wetlands, watersheds, riparian and freshwater ecosystems and species affected by warmer temperatures and reduced stream flows. This could be exacerbated by increased abstraction of river waters to cover increasing freshwater demands. Some effects include: • Reduced forest productivity and phenological changes (i.e. flowering, fruiting) are to be expected with water stress and higher temperatures. • Loss of habitat, foraging substrates, nesting and roosting sites for wildlife, increasing their vulnerability to predation. • Reduced water and food availability for wildlife. • Alteration in species breeding periods. • Increase in forest pest and disease outbreaks.	
• Reduced vegetation cover will exacerbate soil erosion.	
• Reduced stream flows will also facilitate the extension of saltwater intrusion (due to SLR) in low lying watercourses, with salinity further affecting riparian ecosystems in these areas.	
• Forest reserves may face increasing land-use conflicts as coastal populations and activities relocate.	
• Reduced reproductive frequency of endangered loggerhead and leatherback turtles.	

Impacts	Repercussions
Sea level rise impacts	• Opportunities for invasive alien species to spread. • Lower incomes.
• Inundation and resulting degradation of wetlands and other ecosystems in low-lying areas (e.g. low lying dry forests).	
• Increasing seawater intrusion into coastal waterways will affect the composition of freshwater and riparian ecosystems.	
• Beach erosion and the reduction of turtle nesting sites.	
• Migration or loss of wildlife species from altered habitats. • Loss of coastal fish breeding and nursery habitats if mangroves are lost due to the SLR	

Table 7. Potential climate change impacts on Saint Lucia's **education** sector

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Educational infrastructure in high-risk areas may become unsafe for educational purposes and also unusable as a public refuge during extreme events • Increased cases of student or teacher illnesses • Educational continuity affected.
• Destruction of, or damage to, education-related infrastructure (schools, play grounds, entrance roads, etc. and increased risk of accidents for students and faculty during extreme events.	
• More frequent water-borne and food-borne disease outbreaks affecting students and faculty.	
• Education continuity affected by school closures during more frequent extreme events (i.e. flooding episodes, tropical storms).	
• Transport access to schools could be affected due to landslides triggered by stronger rain events.	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Heat stress and cardio- and cerebrovascular conditions resulting from extreme temperature are likely to increase and affect both students and faculty.	
• Aggravated respiratory affections due to increased air pollution from forest and bushfires during dry and hot periods affecting students and faculty. • Increased concentration of dust and agro-chemical particles transported by wind during dry periods could also exacerbate respiratory problems and cause allergic reactions among other complications.	
• Reduced availability of freshwater resources may encourage closure of education centres during dry periods	
• Reduced work productivity during very hot hours	
Sea level rise impacts	
• Closures and relocation of coastal schools could cause major logistical complications for students and faculty to reach the new school areas (which could even be in other islands).	
• Population displacement and migration would affect education continuity	

Table 8. Potential climate change impacts on Saint Lucia's **tourism** sector

Impacts	Repercussions
Impacts of more frequent extreme weather events (intense rainfall events, hurricanes, high winds, storm surges)	• Loss of tourist interest and investment • Local employment in the sector could be affected • Loss of revenue by the tourism sector • Loss of tourism appeal with more frequent flooding and water shortages, water-borne disease outbreaks and reduced marine life • Reduced productivity and loss of income due to interruptions in the provision of services (telecommunications, power supply, water supply and sanitation) • Disincentive to invest in tourism and other types of coastal development • Loss of biodiversity and biodiversity-dependent activities (e.g. fishing, honey production and eco-tourism)
• Land slippage and soil erosion which can lead to loss of tours/excursions such as nature trails which the cruise sector heavily supports.	
• Reduced annual rainfall will place increased stress on the island's water supply.	
• Loss of biodiversity and ecosystems, e.g. loss of forestry; reduced opportunities for attracting visitors interested in ecotourism and nature tours	
• Decrease in locally harvested foods causing increased need for hotels to import food resulting in diminished economic returns for the country.	
• Increase in gastrointestinal and water-borne illnesses, which would affect labour for the sector as well as make the destination less attractive	
• Reduced effectiveness of drainage infrastructure (increasing risk of flooding in low-lying coastal areas and affecting tourism).	
• Destruction of natural resources [e.g. Coral reefs, Beaches, forests etc.] that could result in loss of attractiveness of the region as a destination.	
• Reduced dive tourism.	
• Direct damage to tourism plant and infrastructure such as hotels, restaurants, airport, berthing facilities for yachts and cruise ships and piers.	
• Loss of employment opportunities in the industry.	
• Increased insurance costs.	
Impacts of higher temperatures, prolonged and intense dry episodes and drought	
• Loss of attractiveness of the region as a destination.	
• Loss of coral reefs to coral bleaching as a result of warmer water.	
• Milder winters in the north are expected to reduce demand for Saint Lucia's tourism product.	
• Increased demand for water • Increased demand for cooling systems and energy for their function.	
• Higher risk of food poisoning – higher temperatures can cause extra cases of salmonella infection.	
• Labour productivity declines	
• Sites may experience increase in climate-sensitive vectors disease outbreaks which may affect the safety and comfort of visitors.	
• Higher rates of heatstroke among visitors.	
Sea level rise impacts	
• Erosion of beaches and damage to coastal tourism infrastructure.	
• Reduced efficiency of operation of sea ports and other commercial and recreational coastal activities.	
• Diminished property value as a result of declining amenity value.	
• Reduced efficiency of operation of sea ports and other commercial and recreational coastal activities.	

3. THE NATIONAL ADAPTATION PLAN (NAP) PROCESS

The Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) has established the NAP process as a mechanism to facilitate effective mid- and long-term climate adaptation planning. The NAP is a policy process leading to integration of climate change adaptation into national development planning; and budgeting, as appropriate.

In very general terms, NAP processes build upon the progress that countries have already made in terms of climate change adaptation policy and action. They consist of continuous planning and implementation cycles and imply: the iterative assessment of sectoral and cross-sectoral adaptation needs (based on the assessment of risks, vulnerabilities and capacities); the identification and prioritisation of actions to address those needs (based on accumulated national and international knowledge and practice); and the implementation of prioritised actions. NAP processes entail strong information management, coordination and communication efforts across sectors and stakeholders, and require the resources and skills needed to assess, plan, prioritise, coordinate, implement, monitor and review progress. NAP processes are flexible, transparent, country owned and country-driven. NAP processes use the knowledge acquired during each review cycle to steer and improve the way they guide national adaptation and to tap into emerging policy integration and funding opportunities. A schematic representation of a NAP process is offered in **Figure 3**.

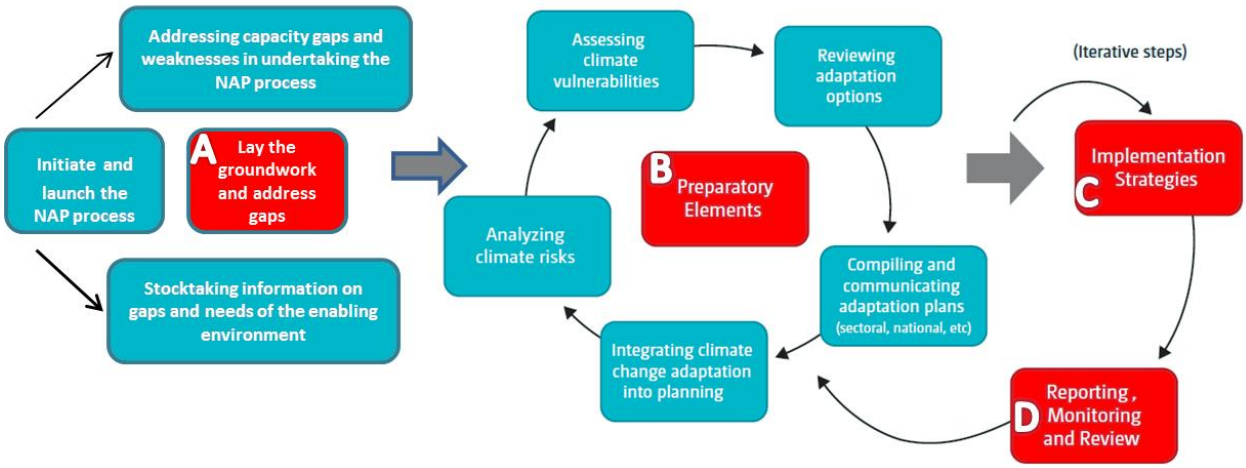

Figure 3. Schematic representation of the NAP Process. The main elements are presented in red and the suggested steps in blue. *Illustration adapted from the Least Developed Countries Expert Group (LEG) Guidelines* [20]

Box 2. Elements of the NAP Process (as defined by the LEG Guidelines[20])

Element A. Laying the Groundwork and Addressing Gaps. Includes stocktaking of needs, opportunities, entry points, and key resources for adaptation in the country. Frequently, it also means establishing an institutional home for the NAP process within government and a legal or administrative mandate to legitimise the process.

The stocktaking identifies the information available on climate change impacts, Vulnerability and Adaptation (V&A) measures already taken to address climate change in the country, as well as assessing the gaps and needs of the enabling environment (policy and institutional frameworks) for the NAP process. The stocktaking also supports the identification of barriers to adaptation design and implementation and to establish potential solutions.

Element B. Preparatory Elements. Includes analytic activities to fill information gaps identified in the previous stocktaking effort. For example, planners might commission a national climate vulnerability assessment or develop a set of future climate scenarios if these did not yet exist. They also might synthesise existing adaptation plans from line ministries or sub-national governments and set procedures for integrating adaptation into key economic sectors.

Element C. Implementation Strategies. This element focuses more concretely on who will do what, and how. Planners use information and criteria from Element B to set priorities and decide on the sequence of activities. They also might focus on how to finance adaptation, build needed capacities, and establish roles and responsibilities for coordinated implementation.

Element D. Reporting, Monitoring, and Review. Planners set up systems to track their NAP's progress. This often means choosing effectiveness criteria, setting up a review timeline, and establishing a reporting and outreach plan.

3.1. STEPS FOLLOWED IN SAINT LUCIA'S NAP PROCESS

The steps taken by the GoSL for the preparation of the NAP have followed the broad recommendations of the LEG Guidelines[20] as summarised below.

Element A: Laying the groundwork and addressing gaps

Initiating and launching NAP process: With the publication of the Saint Lucia Climate Change Adaptation Policy (CCAP), the GoSL had, in effect, started the NAP process; set the national vision for adaptation; recognised the fundamental linkages between development and adaptation; confirmed the role of the National Climate Change Committee (NCCC) as the coordinating mechanism for adaptation activities in the country and outlined broad priorities and expected outputs for the 2013-2022 period, including the clear identification of national adaptation priorities and where potentially required, local Adaptation Plans. The CCAP also established adaptation facilitation, financing and implementation as the core elements of the country's cross-sectoral and integrated framework for addressing climate impacts.

Stocktaking, synthesising information and identifying vulnerabilities: In the past five years, various comprehensive reviews of the climate change adaptation landscape in Saint Lucia have been produced in the framework of activities conducted towards the elaboration of: Saint Lucia's Third National Communication to the UNFCCC; the National Adaptation Strategy and Action Plan to Address Climate Change in the Tourism Sector of Saint Lucia; the Strategic Programme for Climate Resilience (SPCR), Saint Lucia's State of the Environment Report (SOER). These reviews entailed lengthy consultation processes with country stakeholders at multiple levels.

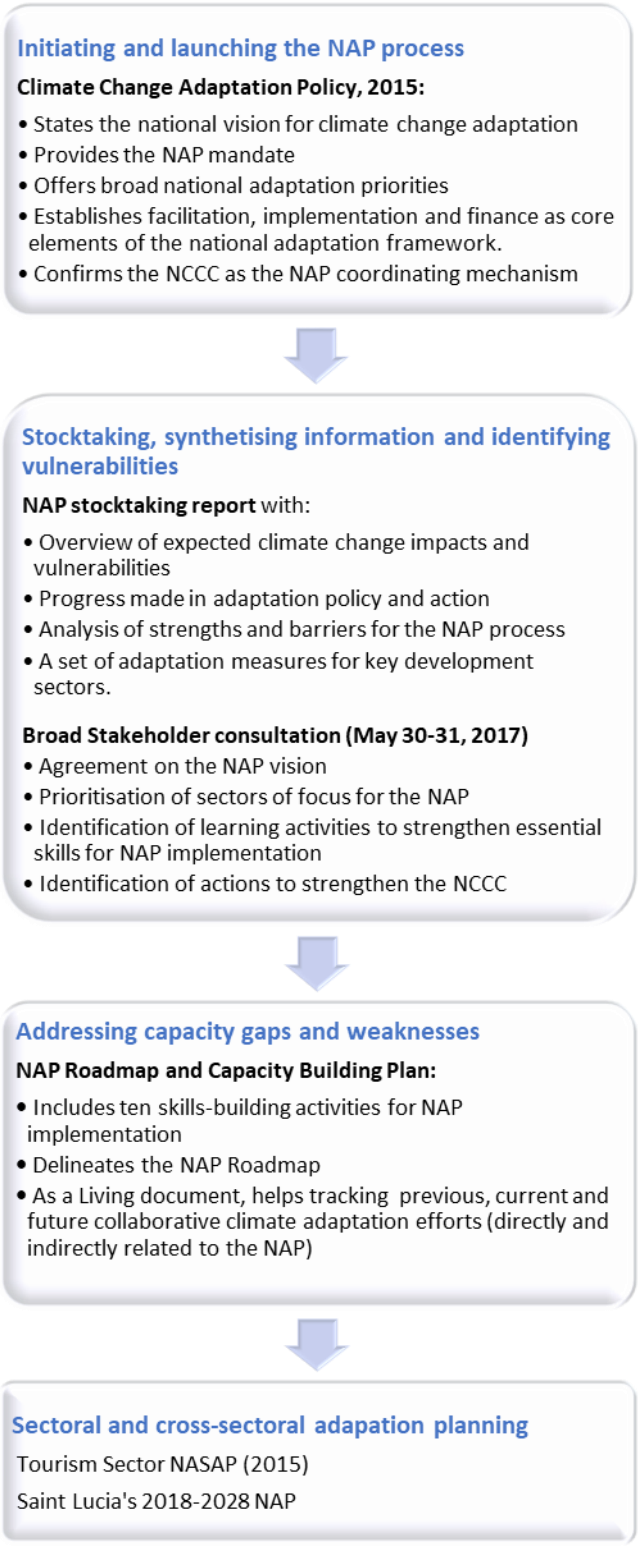

Figure 4. Key steps followed in Saint Lucia's NAP process

To set a solid knowledge base for developing Saint Lucia's NAP, a NAP Stocktaking, Climate Risk and Vulnerability Assessment Report was elaborated.[3] The report complements the findings and recommendations offered in the previous reviews, with supplemental and relevant global, national and sectoral information and analyses. The Stocktaking report offers an overview of expected climate change impacts, vulnerabilities and progress made in the country in terms of climate change adaptation policy and action. It also establishes potential entry points and linkages between current sustainable development policies, strategies and budgeting and the NAP process, and identifies, through Strengths, Weaknesses, Opportunities and Threats (SWOT) and gap and barriers analyses, areas that require strengthening for the country to successfully undertake integrated and cross-sectoral adaptation. Finally, the Stocktaking report includes a set of adaptation measures for key development sectors. These measures had been recommended for the country in the different reports reviewed and thus, previously validated by stakeholders.

Strengths, weaknesses, opportunities and barriers for the engagement of Saint Lucia in the NAP process. The results of the SWOT and gap analyses included in the Stocktaking report indicated that Saint Lucia is in an appropriate position to start the NAP process, but also highlighted some areas that require attention to prevent the NAP from deviating from its focus or suffering from low levels of implementation. Limited national funding and low levels of technical and institutional capacity were identified as the main constraints for the NAP. Other constraints identified included data and information gaps, long periods awaiting policy approval, and weak enforcement of laws and regulations. The opportunities and strengths identified were the existence of a coordinating mechanism, the NCCC, with a relatively long work history; supportive policy initiatives and instruments; and the interest and support of international donors. A threat identified that requires priority attention is the potential low interest and engagement of the private sector and civil society. The recommendations emerging from the Stocktaking report for overcoming the identified limitations are summarised in **Annex 1** and have been taken into consideration in the formulation of the NAP.

NAP sectors of focus: The Stocktaking exercise and its main findings were discussed with, and validated by, national actors during a broad-based consultation workshop conducted in May 2017, in Castries. During the workshop, participants ranked the development sectors/areas which most urgently require climate adaptation interventions due to their national significance, the potential repercussions of non-action and their cross-sectoral nature. The water sector obtained the highest ranking; then agriculture and fisheries; followed by a tie between infrastructure and spatial planning and natural resource management (terrestrial, coastal and marine); followed by education; and health. Despite the ranking, stakeholders determined that all the sectors deserved critical attention. The workshop also allowed participants to agree on the NAP vision; to propose measures to strengthen the NCCC and to reflect on the skills that need to be built for their institutions to undertake effective adaptation planning, as explained below. **Annex 2** presents the list of participants from that initial workshop and several successive NAP consultations and focus group sessions spanning a period of about ten months.

Addressing capacity gaps and weaknesses in undertaking the NAP process. A Capacity Building Plan with concrete learning activities recommended to build and strengthen the skills required for NAP implementation was elaborated. The Capacity Building Plan was based on a) the results of the SWOT and gap analyses prepared for the Stocktaking report and, b) the results of an exercise conducted during the broad-based consultation of May 2017, to identify skills missing or weaknesses in key

sectors for institutions to perform the assessment, prioritisation, coordination, information and risk management functions required for adaptation planning and implementation. Further, a NAP Roadmap was also elaborated, in close collaboration with DSD. The NAP Roadmap details all activities conducted and those still required for the elaboration and operationalisation of the NAP. The NAP Roadmap and Capacity Building Plan document[4] focuses on the NAP itself, but has been defined a "living document" to support the GoSL in tracking previous, current and future collaborative climate adaptation efforts undertaken in the framework of Saint Lucia's wider NAP process, even if not directly included in, or associated with, the strategic objectives of the 2018-2028 NAP.

Element B: Preparatory elements

Largely due to: the active role that DSD has played in facilitating processes for undertaking analyses and preparing various reports (e.g. Saint Lucia's National Communications to the UNFCCC); the information generated, and in-country capacity built by other major projects (e.g. SPCR); and to the progress made in creating an enabling policy environment, most of the NAP groundwork requirements have been fulfilled and Saint Lucia is now well positioned to continue with the actual NAP planning and implementation phases (NAP elements B and C). It is worth noting that previous to its engagement in the NAP process, the GoSL issued, in 2015, the National Adaptation Strategy and Action Plan for the Tourism Sector. This instrument is complementary to the NAP and constitutes the first major attempt for adaptation planning at the sectoral level.

This NAP provides the overarching framework for adaptation planning and implementing both, within and across sectors.

3.2. ENABLING POLICY ENVIRONMENT FOR THE NAP

One of the main objectives of NAPs is "*to facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate*".* To achieve this objective, NAPs are formulated to be coherent with national development and climate change goals and to build on the policy, legislative, institutional and programmatic instruments that can facilitate and support the inclusion of climate adaptation considerations in development planning, budgeting and other decision-making processes, as appropriate.

Saint Lucia's development agenda is guided by national policy imperatives and instruments, including the country's Medium-Term Development Strategy (MTDS), annual Budget Speeches, Annual Estimates of Expenditure (Budget) and corporate plans of individual ministries.[9]

In the field of climate change, the country became a party of the UNFCCC in 1993, submitted its Initial National Communication to the UNFCCC in 2001, its Second National Communication in 2012 and its Third National Communication in 2017. Saint Lucia also submitted its Intended Nationally Determined

* Decision 5/CP.17, paragraph 1.

Contribution (INDC) under the UNFCCC in 2015 and signed the Paris Agreement in 2016. Considerable progress has been made in the integration of climate change into national policies. Currently, the Saint Lucia CCAP of 2015 is the most important policy and guidance document on the matter at the national level. It is complemented by Saint Lucia's SPCR of 2011 and the Climate Change Public Education and Awareness Strategy and Implementation Plan of 2014.

Key national development, and climate policies, legislation and planning instruments for the NAP are listed in **Table 9.***

Table 9. Key Policy, legislation and planning instruments for the NAP.

Policies	
• The Saint Lucia CCAP (2015) • National Climate Change Policy and Adaptation Plan (2002-replaced by above) • National Water Policy (2004) • National Wastewater Policy and Strategic Plan (2017, awaiting adoption) • National Environmental Policy & National Environmental Management Strategy (NEP/NEMS) (2005, revised in 2014)	• National Forestry Policy Revised draft (2008) • National Land Policy (2007) - Revised draft (2017, awaiting guidance on the establishment of an implementing mechanism -a National Land Commission- to be finalised before submission to Cabinet for approval) • National Environmental Education Policy Revised draft (2010)
Planning Instruments	
• National Vision Plan (2008) • MTDS (2012-2016) Sectoral Action Plan	• Strategic Programme for Climate Resilience (2011) • National Biodiversity Strategy and Action Plan (under review) • Framework for Integrated Environmental Management in Saint Lucia (2005)
Legislation	
• Water and Sewerage Act (revision of 2008) Cap 9.03 as amended by the National Utilities Regulatory Commission Act No. 3 (2016) • Water and Sewerage Act (2005) • Water and Sewerage (Water Resource Management) Regulations (2009) • Waste Management Act (2004) • Pesticides and Toxic Chemicals Control Act (2001) • Environmental Management Act (2008) Revised draft (2018) • National Conservation Authority Act (1999)	• Beach Protection Act (1967 and Amendment of 1987) • Land Conservation and Improvement Act (1992) • Wildlife Protection Act (1980) • Maritime Areas Act (1984) • Fisheries Regulations No.9 (1994) • Fisheries Act No.10 (1984) • Public Health Act Chapter 11.01 (1975 revised in 2001) • Public Health Regulation Act No.22 (1978) • Tourism Incentives Act (2005) • Tourism Industry Development Act (1982)

* The listing may not be exhaustive.

• Physical Development and Planning Act (2001)	• Disaster Management Act (2006) • Disaster Preparedness and Response Act (2005) • Castries Constituency Council Act No. 1 (2012) • Saint Lucia Civil Code (2004 Amendment)
National Budget	
• Estimates of Revenue and Expenditure (2016-2017)	

4. SAINT LUCIA'S NATIONAL ADAPTATION PLAN (NAP)

Saint Lucia's NAP sets a strategic framework for guiding and integrating the efforts of the government, civil society and academic institutions, businesses and the international community in strengthening the country's capacity to adapt to climate change between 2018 and 2028. For this, the NAP establishes a plan with a set of implementable, concrete measures identified by multiple stakeholders as being key to reducing experienced and projected climate impacts in the most vulnerable national development sectors. It also offers a series of cross-sectoral interventions to strengthen the capacity of the country's institutions to plan adaptation action and to integrate adaptation considerations into current and future development agendas, plans, programmes and projects. As a rolling plan, the NAP will undergo periodic revision, steering, and modification. The measures included in the NAP identify indicative lead institutions. The period for implementing the measures, within the NAP 2018-2028 cycle will be contingent on funding opportunities becoming available.

4.1. NAP FUNCTION

The NAP has been formulated to:

1. **Inform the process of planning, coordinating and implementing actions** urgently needed for all levels of government and society **to prepare for, and cope with, the impacts of climate variability and change** in the medium and long term and, when possible, tap into opportunities to address climate change.

2. Offer **guidance for the integration of climate change adaptation considerations into ongoing, planned and emerging decision-making processes** in the 7 national development sectors/areas deemed most vulnerable to climate impacts by stakeholders.* The priority sectors/areas are: water, agriculture and fisheries, infrastructure and spatial planning, natural resource management (terrestrial, coastal and marine), education and health.

3. Make available **information and raise awareness on climate change projections, vulnerabilities, challenges and proposed solutions** to promote action within, and collaboration between, ministries, departments and inter-ministerial committees of the GoSL. This is expected to support the integration of climate change adaptation considerations in all decisions made on ongoing and new development activities between 2018 and 2028. This includes, among others, decisions on national and sectoral policy, legislation, programme and project investments.

4. Serve as a mechanism to motivate, encourage and facilitate the **engagement of national non-state actors in** GoSL **adaptation** interventions and to spark autonomous and complementary adaptation initiatives.

* In 2015, a National Adaptation Strategy and Action Plan for the Tourism Sector [13] was developed. The NAP extracted some of the measures presented in this strategy, which have not yet been implemented, and included them in a dedicated section, to ensure coordination and coherence with the other 7 sectors.

5. Become an instrument for the **mobilisation of resources**. The sectoral and cross-sectoral priority measures can be included in projects to be presented to, and funded by, international climate finance sources and can also be used by long-standing donor agencies to identify activities to support, based on their own funding priorities and preferences. It is also expected that, where possible, national resources will be increasingly allocated to adaptation as the NAP cycle progresses and adaptation considerations are included into national development policies, plans and programmes.

6. Become a concrete response of Saint Lucia to the Sustainable Development Goals (SDG), specifically to SDG 13: "Take urgent climate action" and target, 13.2 "Integrate climate change measures into national policies, strategies and planning". Through the formulation and implementation of SASAPs, the NAP will support many other SDGs and related targets.

4.2. NAP AUDIENCE

The NAP targets policy makers, technical officers and managers in all GoSL's ministries and departments as well as non-state actors that can partner with the government in building climate resilience (civil society, the private sector, academic institutions and the media, among others). It also targets regional and international partners and donor agencies interested in making technical and financial contributions for the execution of the adaptation measures listed as priorities for building climate resilience in Saint Lucia. The NAP offers specific guidance to government staff in the sectors of focus. However, it is expected and highly recommended that during the NAP's execution, efforts are made to coordinate and collaborate in climate change and development-related actions which directly or indirectly involve other sectors, other organisations and across different scales. This will allow for identifying and building on synergies, increasing cross-sectoral adaptation benefits and accelerating adaptation. It will also permit identifying and reducing potential detrimental effects that development or adaptation activities undertaken in one sector could have on the adaptation or development efforts of another.

4.3. NAP VISION

Saint Lucia and her people, their livelihoods, social systems and environment are resilient to the risks and impacts of climate change through continuous, coordinated and effective adaptation efforts.

4.4. NAP EXPECTED IMPACT

1. To strengthen the capacity of Saint Lucia's government institutions, businesses and population to prepare for, withstand and recover from and address the impacts of climate variability and climate change.

2. **Inform the process of planning, coordinating and implementing actions** urgently needed for all levels of government and society **to prepare for, and cope with, the impacts of climate**

variability and change in the medium and long term and, when possible, tap into opportunities to address climate change.

4.5. NAP GOALS

The adaptation measures included in the NAP have been formulated to address identified needs and to directly contribute to the achievement of a series of strategic objectives, **6 cross-sectoral and 26 sectoral outcomes and 2 overarching NAP goals**, considered essential for Saint Lucia to realise its NAP vision and impact and the objectives of the CCAP (see **Table 10**).

It is expected that the achievement of the overarching NAP Goal 1 will occur largely through the implementation of cross-sectoral measures and that attaining the overarching Goal 2 will be possible through the implementation of sectoral adaptation measures included in the NAP, or in the SASAPs, when these are available.

Table 10. NAP overarching goals, cross-sectoral and sectoral outcomes.

<table>
<tr><th colspan="2">Overarching NAP Goals</th></tr>
<tr><td colspan="2">1. To enhance the national enabling environment for climate-related adaptation and risk reduction action within and across development sectors

2. To accelerate the implementation of climate adaptation and risk reduction actions critical to safeguard the country's socioeconomic and environmental systems</td></tr>
<tr><th colspan="2">Cross-sectoral outcomes</th></tr>
<tr><td colspan="2">1. Improved national, legal and regulatory framework to facilitate climate adaptation across sectors
2. Increased generation and use of climate information in national and sectoral decision-making
3. Increase capacities to design and implement climate adaptation projects across sectors
4. Strengthen national capacities for integrating climate adaptation considerations into national development agendas, programmes and projects
5. Strengthened preparedness to climate variability and extremes at the sectoral and national levels
6. Increased funding for climate adaptation action</td></tr>
<tr><th colspan="2">Sectoral outcomes</th></tr>
<tr><th>Water</th><th>Agriculture</th></tr>
<tr><td>1. Enhanced enabling environment and improved behaviour for water-related climate adaptation action
2. Increased water access, availability and quality
3. Increased water efficiency and conservation
4. Strengthened preparedness to climate variability and extremes</td><td>1. Enhanced enabling environment for climate adaptation action in the agriculture sector
2. Enhanced nutrition, food availability, quality and security through adaptation in the agriculture sector
3. Strengthened partnerships for scaling up climate resilient agriculture</td></tr>
</table>

	4. Strengthened preparedness to climate variability and extremes in the agriculture sector
Fisheries	***Infrastructure and Spatial Planning***
1. Enhanced enabling environment for climate adaptation action in the fisheries sector 1. Enhanced nutrition, food availability, quality and security through adaptation in the fisheries sector 2. Strengthened partnerships for building sustainable and resilient fisheries in a changing climate 3. Strengthened preparedness to climate variability and extremes in the fisheries sector	1. Enhanced enabling environment for climate adaptation in infrastructure and spatial planning 2. Strengthened infrastructure to withstand climate impacts 3. Enhanced infrastructure-based climate adaptation 4. Strengthened preparedness to climate variability and extremes
Natural Resource Management (Coastal, Marine and Terrestrial)	***Education***
4. Enhanced enabling environment for Ecosystem-based adaptation and natural resource management under a changing climate 5. Increased ecosystem quality and coverage 6. Strengthened ecosystem based adaptation	1. Enhanced enabling environment for climate adaptation education 2. Improved and expanded climate change education as the basis for effective adaptation 3. Professional capacities built for leading future climate adaptation planning implementation 4. Strengthened preparedness to climate variability and extremes
Health	***Tourism****
1. Enhanced enabling environment for health-related climate adaptation action 2. Improved public health under a changing climate 3. Strengthened preparedness to climate variability and extremes	1. Viable and productive tourism sector through direct interventions and collaborations and synergies with all other sectors

* Note that the outcome presented here for the tourism sector is representative of the following three sub outcomes in the NASAP:

1. Improved policy, legal, regulatory and institutional framework for the tourism sector;
2. Improved technical and institutional capacity for the tourism sector;
3. Enhanced and improved training and awareness in relation to climate change and the tourism sector.

4.6. NAP STRATEGY AND SCOPE

Saint Lucia's NAP consists of two sets of implementable actions. The first is **a set of cross-sectoral interventions** to strengthen the capacity of the country's institutions to identify, prioritise, plan, attract funding for, and effectively implement, adaptation, based on sound evidence and the best-practice available. The second is **a set of adaptation measures, specific to the 7 sectors/areas prioritised in 2017 (water, agriculture, fisheries, infrastructure and spatial planning, natural resource management (terrestrial, coastal and marine), education and health) and tourism.*** These sectoral measures were identified by the relevant stakeholders in the framework of national climate change and development programmes undertaken in the country in the past 10 years (e.g. SPCR, National Communications to the UNFCCC, etc.) and complemented and confirmed as current priorities during the NAP consultations. The implementation of the sectoral measures presented is only the starting point of a more in-depth adaptation process at the sector level, as it is expected that between 2018 and 2028, the necessary funding can be obtained, not only for the execution of these measures, but also for the preparation and implementation of a Sectoral Adaptation Strategy and Action Plan (SASAP) for each priority sector, and possibly for other areas which will be identified as the NAP implementation progresses (e.g. waste, planning and physical development, housing, private sector). The SASAPs will become the blueprints for sectoral adaptation, delineate a detailed 10-year strategy for adaptation within each sector and will include a portfolio of project concept notes ready to present to donors. The NAP's cross-sectoral measures, sectoral measures and the SASAPs will all be aligned with, and contribute to, attaining the NAP and CCAP goals.

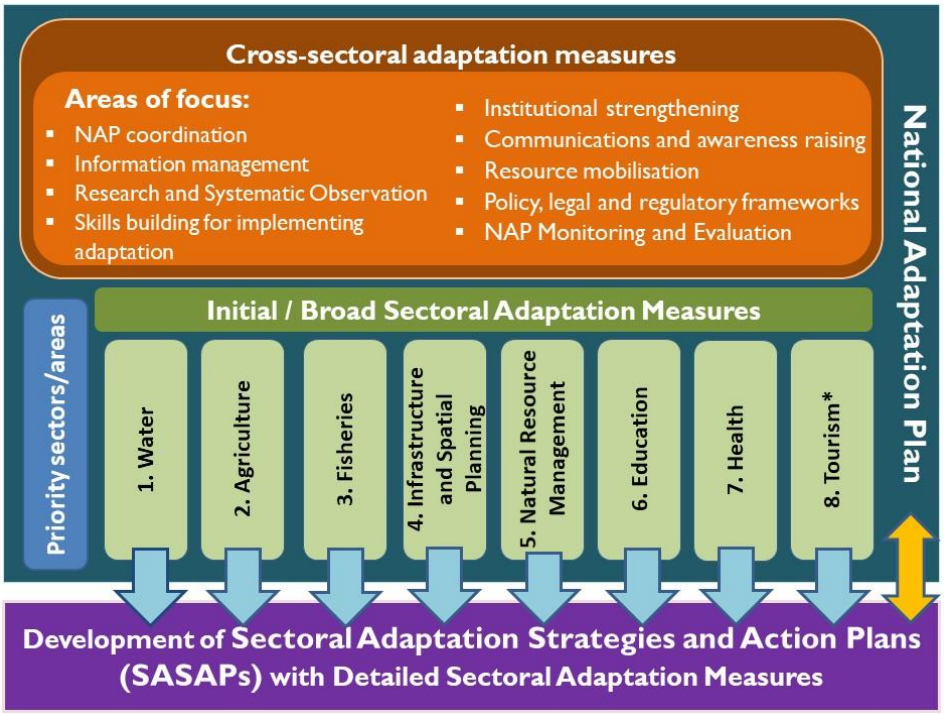

Figure 5. NAP strategy

* Adaptation measures, extracted from the National Adaptation Strategy and Action Plan for the Tourism Sector, developed by the GoSL in 2015 [16] are also presented.

4.7. INSTITUTIONAL ARRANGEMENTS

The NAP will be implemented within the organisational structure of the GoSL, in partnership with non-state actors, as applicable. To promote ownership and the progressive integration of climate adaptation considerations into sectoral development activities, the formulation and execution of SASAPs and the implementation of adaptation measures outlined in the NAP for the priority sectors will be the responsibility of the line ministries and agencies with the mandate for managing those sectors. However, as the NAP follows an integrated approach, sectoral adaptation issues and priorities will also be communicated, discussed, advocated for and linked to, the national policy and decision-making level. This will be achieved through the active participation of line ministries and agencies in the NCCC, the NAP coordinating mechanism. The NCCC will take, among its responsibilities, the lead in the coordination and implementation of all cross-sectoral activities. Details on the multi-agency NCCC and its role in the NAP are provided in section 4.7.1.

The NAP is expected to benefit all Saint Lucians, particularly those who are most vulnerable to climate impacts. However, to reach its goals, the NAP requires the collaboration and engagement of civil society, the private sector, academic institutions and the media, as well as technical and financial support, especially at the international level, consistent with the limitations of SIDS. The mechanisms of engagement with the various stakeholders will be defined by the NCCC and line ministries/agencies on the basis of the activities planned and funded.

4.7.1 NAP COORDINATION MECHANISM

The enormous challenge of addressing the expected impacts of climate change cannot be tackled by any single institution. It depends on the engagement and effort of all levels of government, industry and civil society, and as such, planning and implementing adaptation is a national endeavour. Effective adaptation coordination helps to avoid the duplication of effort; minimising the risk of maladaptation (e.g. the potential negative effects adaptation/ development interventions in one sector/area may bring to the development or adaptation potential in another sector/area); identifying and utilising synergies; communicating and scaling-up successful interventions; and ensuring the adaptation needs of all national sectors and levels of society are identified and acted upon.

Saint Lucia's CCAP bestows the NCCC, established by the Cabinet of Ministers in 1998, with the responsibility of overseeing its implementation, and therefore, the NCCC is the **NAP coordinating mechanism**. The NCCC is a multi-sectoral advisory body that supports and facilitates the implementation of climate change-related actions of interest nationally and for various sectors.

The NCCC comprises representatives of public, statutory, academic and private sector bodies and may, co-opt other members on an 'as-needed' basis (see the list of NCCC members in **Annex 4**). In this regard, some organisations have established new Departments, Divisions, Sections and Units that are key to the climate change agenda. In other cases, some Ministries, Departments, Divisions, Sections and Units have simply taken on greater prominence over the years. In any case, every effort has been made to include and involve these entities, reflective of emerging developments. These entities have become regular participants in meetings and exchanges of the NCCC. Since it was established by the Cabinet of Ministers in 1998, the NCCC, with the government agency with direct responsibility for coordinating the climate change portfolio, as its secretariat, has helped to facilitate and guide national

efforts related to: climate change adaptation and building resilience; national climate change vulnerability and needs assessments, policies, strategies and action plans; climate change education and awareness raising; and training and capacity building. Specifically, this Committee sits within the agency with responsibility for coordinating climate change efforts, which is the Sustainable Development and Environment Division (SDED) of the DSD, currently housed under the Ministry of Education, Innovation, Gender Relations and Sustainable Development. The NCCC meets periodically as a formal Committee, but members are constantly involved in guiding the climate change effort, electronically and in person, via specific programmes, projects and activities.

In its NAP coordination role, the NCCC will:

- Provide advice and guidance on the implementation of the NAP.
- Facilitate coordination of cross-sectoral adaptation interventions.
- Facilitate information and data sharing across ministries and stakeholders.
- Coordinate public communications and awareness raising efforts on adaptation activities that involve various sectors, including the NAP.
- Facilitate the identification of emerging sectoral and national policy and public investment entry points for the integration of climate change adaptation considerations.
- Guide, promote and facilitate the inclusion of sectoral adaptation priorities in national policy and decision-making levels.
- Support non-state actor (including community and private sector) engagement in national adaptation initiatives.
- Coordinate and support resource mobilisation efforts for the implementation of NAP cross sectoral adaptation measures.
- Support the creation of new, and strengthening of existing, partnerships for climate-resilient development.
- Promote coordination and synergy with other national and regional climate change and development projects, and with other multilateral environmental agreements.
- Track activities conducted by the various line ministries and agencies and non-state actors that are relevant, and contribute to, achieving the objectives and outcomes of the NAP, even if these activities occur outside of the scope of the NAP or in sectors that were not targeted for this NAP cycle.
- Lead the process of monitoring and periodic review of NAP implementation progress, collecting best practices and steering the process to incorporate activities to solve unforeseen problems and gaps that jeopardise the NAP from achieving its goals; or activities to tap into emerging funding opportunities.

- Lead the NAP implementation evaluation at the end of 2028.

- In advance of expiration of the 2018-2028 NAP cycle, lead all necessary preparations for the formulation of its successor.

4.8. NAP IMPLEMENTATION AND FUNDING

It is anticipated that the adaptation measures presented in the NAP will be implemented or at least initiated during the 2018-2028 period, according to their degree of urgency. However, it is also clear that their implementation will depend on funding, policy and other opportunities opening up during this time; opportunities will be seized for implementation as they arise, cross-sectorally or sectorally.

Given the broad scope of the NAP, it is to be expected that the execution of most of the specific measures may occur as a consequence of their inclusion in projects and programmes funded from both national and international sources. The NAP includes indicative outputs to facilitate the planning and design of such projects and programmes.

The execution of most actions included in the NAP (and those included in the SASAPs) relies on the assumption that further to national budgetary efforts that are commensurate with national circumstances, the level of international support that Saint Lucia has received for development and climate change projects and programmes will be maintained and that additional climate finance for adaptation in the prioritised sectors will be attracted, for example, through the Green Climate Fund (GCF), Adaptation Fund and multilateral and bilateral arrangements. The execution of the NAP will, nonetheless, require the proactive engagement and time of GoSL staff and potentially, the allocation of new public resources. It is also assumed that over time, adaptation will become immersed in all new development projects of the GoSL and that for some prioritised sectors, such as water, the institutions in charge will be able to generate revenue from their regulatory functions (e.g. user fees, royalties, licenses, among other) that can possibly be directed to their operations to help supplement other support received.

In view of the above considerations, it is the intention, in the coming years, and to the maximum extent possible, that elements of the NAP be integrated into the existing and proposed cooperation programmes of Saint Lucia's bilateral and multilateral partners. To ease this process and facilitate funding, the NAP's indicative outputs can be grouped for the elaboration of specific programmes and projects, as opportunities arise.

The NAP should be shared and discussed with all partner agencies and stakeholders to facilitate awareness raising of its objectives and planned activities and secure high-level buy-in that will enhance opportunities for the inclusion of the SASAP priorities in national and sectoral policy and budgets, as appropriate.

4.9. GENDER CONSIDERATIONS

The UNFCCC calls for the mainstreaming of gender across all activities involved in the NAP process, with the aim of decreasing gender-based vulnerabilities, promoting gender equality in decision-making and ensuring that the implementation of adaptation measures does not impose additional burden to women in particular, and does not promote the domination of any gender over others. At the same time, the NAP is an inclusive process, which places special attention on increasing the adaptive capacity of vulnerable groups for the planning and implementation of policy and actions to deliver resilience benefits across all levels of society. It is worth noting that in 2010, 40% of Saint Lucian households were headed by women and unemployment was about 7% higher in women than men.[10] However, this gap decreased to 4% in 2012[21], while the participation of women in the labour force increased from 45% to 47% and that of men decreased from 54% to 52%. Women in the country enjoy equal access to services such as education (Education Act of 1999) and although the level of public representation is not yet equal to men, it is growing. In Saint Lucia, some livelihood activities, such as fishing in the open sea, are by choice, dominated by men, which is culturally acceptable.

In Saint Lucia, poverty, age, and level of education achieved appear to be greater drivers of vulnerability than gender, but more research may be needed. The Minister of Education, Innovation, Gender Relations and Sustainable Development stated in early 2018 that a Gender Policy will be developed in the near future. While this is not specific to climate change, it is expected that the latter will be given due consideration. In addition, as in other Caribbean SIDS, the participation of women in politics and civil service has increased in the past years. Currently, four out of the 10 ministries in the country are headed by female Ministers. There are six female Permanent Secretaries (two in one Ministry) and seven Deputy Permanent Secretaries. It is important to note that among the Ministries headed by women Ministers, are the Ministry of Equity, Social Justice, Empowerment, Culture, Sports and Local Government and the Ministry of Health and Wellness. It can well be said that the responsibility of leading climate change-related policy falls mostly on women: the NAP process has been initiated under the leadership of the SDED of the DSD, housed under the Ministry of Education, Innovation, Gender Relations and Sustainable Development, where the Minister, the Permanent and Deputy Permanent Secretary, the Chief of Department, the Deputy Chief of Department, the Chief Technical Officer and 9 out of 10 of the Division's technical officers are female. Incidentally, the Lead Climate Change Negotiator for Saint Lucia, who also serves as Thematic Coordinator for Loss and Damage for the Alliance of Small Island States (AOSIS) under the UNFCCC; and the SIDS representative on the Executive Committee of the Warsaw International Mechanism for Loss and Damage, is a Saint Lucian female based within the Division.

In this context, and to foster equality in adaptation benefits, Saint Lucia's NAP and associated SASAPs focus their attention on vulnerable groups, and although gender-disaggregated information will be collected and assessed, the NAP and SASAPs include activities focussing on women and men based on other vulnerabilities.

5. CROSS-SECTORAL ADAPTATION PRIORITIES

Making decisions on, and implementing effective interventions to, reduce climate change risks and integrate adaptation into development planning processes and initiatives, requires solid data; the ability to transform the data, as it emerges, into useful and science-based information; and the capacity to manage and use the information to identify, appraise and prioritise adaptation options. It also demands an enabling policy and regulatory environment and capacities to coordinate, obtain funds for, communicate with and engage stakeholders in, the implementation of adaptation actions. As gaps and limitations in these issues were identified to pervade the boundaries of single sectors, Saint Lucia's NAP takes a cross-sectoral approach to address them and to utilise cross-cutting opportunities (e.g. policy entry points and funding options) that may arise in the 2018-2028 period. These measures would require the involvement of multiple agencies. Given the role of DSD as Saint Lucia's Climate Change Focal Point, it is envisaged that as far as is practical, this entity is expected to play a coordinating, facilitating, mobilising and enabling role, in collaboration with key entities, such as those with responsibility for planning, infrastructure, disaster risk management, finance and natural resource management. These and more are part of the inter-agency NAP-coordinating mechanism, that is, the NCCC.

The NAP's cross-sectoral measures follow and include some measures that are already being pursued in part or in full. Some measures may also appear to be sector-specific, but are of value to multiple sectors, warranting their inclusion here. Alignment, consistent with the CCAP, is indicated.

OUTCOME 1. IMPROVED NATIONAL, LEGAL AND REGULATORY FRAMEWORK TO FACILITATE CLIMATE ADAPTATION ACROSS SECTORS

STRATEGIC OBJECTIVE 1. ACCELERATE POLICY, LEGISLATIVE AND REGULATORY PROCESSES INDISPENSABLE FOR ADAPTATION PLANNING AND IMPLEMENTATION ACROSS SECTORS

	Activities	Indicative Outputs	Alignment with the CCAP
1	Accelerate the formal approval of the Land Use Policy	- Land use policy updated including climate-change adaptation considerations and endorsed.	Facilitation
2	Develop a National Land Use Plan to ensure that it addresses watershed degradation, protection of critical and sensitive ecosystems, saline intrusion, SLR and groundwater use.	- National Land Use Plan developed and addressing watershed degradation, protection of critical and sensitive ecosystems, saline intrusion, SLR and groundwater and providing guidance on the intensive use of land for development. - Execution of the Revised National Land Use Plan initiated.	Facilitation
3	Develop comprehensive land use and development maps informed by	- Study on land use conducted, including: a) analyses on recent trends, b) potential	Facilitation

	Activities	Indicative Outputs	Alignment with the CCAP
	strategic social and environmental assessments	changes under the implementation of current and planned projects and policies and, c) updated land use maps. - Results of the study available in a report and communicated. - Updated land use and development maps produced.	
4	Revise development standards / guidelines and integrate climate adaptation considerations ("make them climate-smart" e.g. coastal setbacks, river/ravine buffers; requirements for open spaces and conservation reserves; land purchases by government for adding to the land bank).	- Development standards/guidelines revised and including climate change adaptation considerations.	Facilitation
5	Explore and consider establishing an autonomous body for the environment, including climate change, such as a Sustainable Development Council	- Autonomous body for the environment, including climate change established.	

OUTCOME 2. INCREASED GENERATION AND USE OF CLIMATE INFORMATION IN NATIONAL AND SECTORAL DECISION-MAKING

STRATEGIC OBJECTIVE 1. IMPROVE ACCESS AND USE OF CLIMATE, SOCIOECONOMIC AND ENVIRONMENTAL INFORMATION RELEVANT TO ADAPTATION.

	Adaptation measures	Indicative outputs	Alignment with the CCAP
6	Create a new or strengthen an existing portal to centralise climate, environmental and socioeconomic data, as well as mapping resources and reports relevant to adaptation in general and to the NAP process in particular.	Portal created, populated with the relevant information and offering interfaces for its dissemination to various audiences.	Facilitation

STRATEGIC OBJECTIVE 2. GENERATE CLIMATE, ENVIRONMENTAL AND SOCIOECONOMIC DATA AND SCIENCE-BASED INFORMATION CRITICAL TO ADAPTATION ACROSS SECTORS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
7	Develop high resolution climate-related hazard maps, including landslide, flood, fire and erosion risk maps)	- Hazard assessments conducted information analysed in reports and communicated. - High resolution flood risk maps produced. - High resolution erosion risk maps produced. - High resolution landslide risk maps produced. - High resolution fire risk maps produced.	Facilitation
8	Develop a climate change research agenda for areas such as hydrology, meteorology, oceanography and biodiversity.	- Climate change research agenda developed.	Facilitation
9	Establish a mechanism to promote, encourage and support climate change research (including formal partnerships with academia)	-Study to identify potential mechanisms to promote encourage and support climate change research in Saint Lucia conducted. -Mechanisms implemented	Facilitation
10	Model and map the risk of climate-sensitive disease with climate change scenarios to support long-term planning.	- Study conducted for modelling and mapping the risk of disease with climate change scenarios, based on improved data, up-to-date climate projections and epidemiological information; results of the study analysed, presented in a report and communicated - Disease risk maps with climate change scenarios elaborated.	Facilitation
11	Model and map coastal flooding under SLR to be assessed and updated periodically	- Study on coastal flooding under various SLR scenarios conducted, information analysed in report and communicated. - Coastal flooding maps under SLR produced.	Facilitation
12	Improve data collection and analysis for modelling and mapping climate-related disease	- Analysis of current data collection systems for disease conducted, with recommendations on how the different sectors can contribute to decrease risks (e.g. modifications in land-use, land-planning, construction, water storage,	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		etc.) and on how to improve disease outbreak surveillance systems. - Improved data collection and surveillance systems for disease outbreaks set-up. - Study conducted for modelling and mapping the risk of climate-sensitive disease outbreaks with climate change scenarios, based on improved data collection. Results of the study analysed, presented in a report and communicated - Disease outbreak risk maps with climate change elaborated.	
13	Update water, forest and marine resource assessments to improve natural resource management under changing climate conditions	- Studies conducted, assessing a) current resource status b) observed trends, c) potential climate change impacts on resources under various scenarios, d) other pressures over resources, e) opportunities for safeguarding the resources in the long-term and f) concrete recommendations for policy-makers and decision-makers in the various development sectors involved. - Updated national water resource assessment report produced and communicated. - Updated national forest resource assessment report produced and communicated. - Updated marine resources assessment report produced and communicated.	Facilitation
14	Expand the National Poverty Assessment to include climate vulnerability	- Updated national poverty assessment including climate vulnerability published in report and communicated.	Facilitation
15	Conduct a national climate vulnerability assessment to inform decision-making processes on human groups and geographic areas to be prioritised for targeted adaptation action.	- Climate vulnerability study conducted to determine the populations and groups most vulnerable to climate impacts. The study should: a) be based on the updated poverty assessment, the most updated environmental and hazard risks information and climate projections; b) map the most vulnerable locations to climate change (based on	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		single and multi-hazard approaches) and, c) provide recommendations to decision-makers in the various development sectors on interventions to reduce vulnerability and the geographic areas and groups to target the interventions. - Results of the study presented in a report and communicated in various formats to multiple stakeholders to inform adaptation action.	
16	Establish human resource and training expertise in non-governmental organisations (NGOs) and community-based organisations (CBOs) to support the GoSL's efforts to monitor and manage natural resources (e.g. water quality monitoring, alien species monitoring, reef protection measures, etc.)	- Training workshops, courses and hands-on learning activities for NGOs and civil society organisations to support government-led and other water resource management and water monitoring activities.	Facilitation

STRATEGIC OBJECTIVE 3. ENHANCE RESEARCH AND SYSTEMATIC OBSERVATION (RSO) IN THEMES THAT ARE CRITICAL TO CLIMATE CHANGE ADAPTATION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
17	Conduct relevant research and systematic observation to inform adaptation measures under the priority sector/area.	- Research agenda established for each of the priority sectors/areas - Research agenda implemented	Facilitation

STRATEGIC OBJECTIVE 4. STRENGTHEN PUBLIC COMMUNICATION AND OUTREACH EFFORTS ON ADAPTATION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
18	Develop a NAP communications and outreach strategy	- NAP communications strategy designed and implemented. - Media engaged and reporting on NAP activities and milestones.	Facilitation
19	Set up a climate change web portal for Saint Lucia	- Saint Lucia's Climate Change website launched and updated periodically,	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		including updates on NAP activities and results.	
20	Strengthen the knowledge and interest of national media for the communication of information on climate change risks, challenges and solutions and for the wide dissemination of information on the progress and results of NAP activities.	- Training sessions with media representatives on climate change adaptation conducted periodically. - Awards for good reporting on climate change adaptation created. - A series of programmes on climate change adaptation created and running, in local media, to promote simple actions people can take at the household and community level to reduce risks.	Facilitation
21	Strengthen the capacity of GoSL representatives to communicate climate adaptation issues effectively and at various levels	- Periodic short training on public climate change communication delivered to technical officers and higher-level officials.	Facilitation
22	Establish communications champions as a subcommittee of the NCCC	- A communications champions subcommittee established within the NCCC	Facilitation

OUTCOME 3. INCREASE CAPACITIES TO DESIGN AND IMPLEMENT CLIMATE ADAPTATION PROJECTS ACROSS SECTORS

STRATEGIC OBJECTIVE 1. STRENGTHEN INSTITUTIONAL CAPACITIES TO UNDERTAKE RESULTS-BASED MANAGEMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
23	Conduct training workshops on results-based management, targeting Heads of Department, line managers, team leaders and technical officers engaged in climate change adaptation initiatives at all ministries and departments.	- Training conducted periodically, and including modules on a) project design, b) budgeting, c) Monitoring and Evaluation (M&E), d) reporting and communicating results, e) resource mobilisation and f) organisational skills (planning, scheduling, deadline setting and time management)	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
24	Develop public service operations guidelines that give consideration to climate change	- Public service operations guidelines developed	Facilitation
25	Promote better integration of climate change considerations into proposal writing, implementation and monitoring	- The use of the Caribbean Climate Online Risk and Adaptation Tool (CCORAL) or a simpler instrument is established and promoted for better integration of climate change considerations into proposal writing.	Facilitation
26	Include a communications/awareness raising component in all emerging NAP-related initiatives	- Communications/awareness raising included in all emerging NAP-related initiatives (projects).	Facilitation
27	Organise peer-exchange workshops for Heads of Department, middle managers and team leaders to learn from best experience in adaptation management and mainstreaming.	- Series of peer-exchange short workshops organised and undertaken. - Best practices adopted and exchanged within departments and agencies and with the NCCC.	Facilitation

STRATEGIC OBJECTIVE 2. STRENGTHEN INSTITUTIONAL CAPACITIES TO ENGAGE CIVIL SOCIETY AND THE PRIVATE SECTOR IN ADAPTATION EFFORTS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
28	Conduct training sessions for technical officers, CBOs and NGOs on Participatory Learning and Action (PLA) approaches and tools for community-based adaptation.	- Training conducted periodically. - Concerns and needs of communities integrated in NAP-related activities. - Communities actively engaged in adaptation action (spontaneous and NAP-driven adaptation activities)	Facilitation
29	Conduct training sessions for private sector representatives on the integration of climate change adaptation into their operations and investments	- Training sessions for private sector representatives on the integration of climate adaptation considerations into their operations conducted periodically.	Facilitation
30	Develop a SASAP for the private sector, that includes incentives for businesses to engage in climate change adaptation efforts and in the	- SASAP for the private sector developed and including incentives for businesses to engage and invest in climate adaptation efforts and for the creation	Facilitation and finance

	Adaptation measures	Indicative outputs	Alignment with the CCAP
	creation of Public-Private Partnerships for adaptation.	of Public-Private Partnerships for adaptation.	

OUTCOME 4. STRENGTHEN NATIONAL CAPACITIES FOR INTEGRATING CLIMATE ADAPTATION CONSIDERATIONS INTO NATIONAL DEVELOPMENT AGENDAS, PROGRAMMES AND PROJECTS

STRATEGIC OBJECTIVE 1. IDENTIFY AND UTILISE OPPORTUNITIES FOR CLIMATE CHANGE ADAPTATION INTEGRATION AT THE POLICY AND ACTION LEVEL

	Adaptation measures	Indicative outputs	Alignment with the CCAP
31	Establish within the NCCC a system for members and partners to inform on opening entry points on a regular basis.	- System for NCCC partners to inform on opening entry points established and operating. - NAP Roadmap adjusted periodically to include emerging entry points.	Facilitation

STRATEGIC OBJECTIVE 2. STRENGTHEN SKILLS REQUIRED FOR ADAPTATION INTEGRATION AT ALL LEVELS OF GOVERNMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
32	Conduct training sessions on climate change adaptation integration into policy, programmes and projects for technical officers, team leaders and higher-level officials from all Ministries and Departments.	- Training conducted periodically during the NAP cycle. The training agendas include: a) basic climate change science; b) climate change and development linkages; c) why and how to integrate adaptation into policy; d) costing, assessing and financing adaptation measures; e) how to increase institutional capacity for adaptation integration.	Facilitation
33	Establish a series of short seminars on strategic climate change leadership for Ministers and Permanent Secretaries.	- Series of short-term seminars on strategic climate change leadership for Ministers and Permanent Secretaries delivered.	Facilitation
34	Organise a NAP workshop for policy makers in Saint Lucia to help raise awareness of the process and its progress and increase high level	- NAP workshop for policy makers organised and executed, at least twice during the NAP cycle	Facilitation

Adaptation measures	Indicative outputs	Alignment with the CCAP
ownership and leadership for adaptation in the country.		

STRATEGIC OBJECTIVE 3. STRENGTHEN COORDINATION OF ADAPTATION PLANNING AND ACTION

Adaptation measures	Indicative outputs	Alignment with the CCAP
35 Assess and address the technical capacity and membership needs of the NCCC to drive the NAP.	- Technical capacity needs identified and a plan to fill those needs elaborated and put in place. - The needs of NCCC members to drive the NAP analysed and addressed through the configuration of NAP workgroups/committees, where missing sectors/groups are invited to participate.	Facilitation
36 Increase the frequency and efficiency of NCCC meetings and set-up reporting and follow-up procedures (from the NCCC meetings to the line ministries and vice-versa)	- Financial resources to hold more frequent meetings secured. - Frequency of NCCC meetings increased to meet the increasing workload brought by NAP implementation. - Procedures identified, agreed upon, set-up and used. - Increased flow of information between GoSL agencies and stakeholders.	Facilitation
37 Encourage the active participation of the private sector and vulnerable groups in NAP-related activities of the NCCC, to better facilitate their needs and interests being integrated in the relevant NAP interventions.	- Participation of the private sector and all vulnerable groups secured through their participation in NCCC committees/workgroups.	Facilitation

OUTCOME 5. STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES AT THE SECTORAL AND NATIONAL LEVELS

STRATEGIC OBJECTIVE 1. INCREASE NATIONAL HUMAN CAPACITY TO ASSESS AND ADDRESS CLIMATE-RELATED VULNERABILITY AND RISK

	Adaptation measures	Indicative outputs	Alignment with the CCAP
38	Deliver training on Comprehensive Risk Management/Integrated Climate Risk Management and tools for Heads of Department, Middle Managers, Team Leaders and Technical Officers.	Training delivered periodically during the NAP cycle, with the training agenda including: a) basic climate change science, b) climate change modelling approaches, c) risk, vulnerability and resilience concepts and measures; d) tools and resources available to assess vulnerability and risk, screen climate risks in projects and activities and establish acceptable risk thresholds; e) Risk management options.	Facilitation

OUTCOME 6. INCREASED FUNDING FOR CLIMATE ADAPTATION ACTION

STRATEGIC OBJECTIVE 1. INCREASE NATIONAL CAPACITY TO SECURE FUNDING FOR ADAPTATION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
39	Identify all climate and development funding streams and institutions that could be used for the implementation of NAP activities and make information accessible to NCCC/line Ministries.	Study conducted on major climate change and development funding options for the implementation of NAP activities (including climate finance, bilateral and multilateral development funds, private foundation grants and others). The study report includes a) an overview and analysis of the funding opportunities reviewed; b) recommendations for funding each NAP measure, c) deadlines, formats and other funding requirements and, d) recommendations on the aggregation of measures for the submission of proposals to major funders (donors).	Facilitation
40	Deliver training on climate finance for adaptation projects to technical	-Hands-on training delivered (periodically during the NAP cycle), with modules on: a) the international climate finance landscape, b) potential climate finance sources and	Facilitation

Adaptation measures	Indicative outputs	Alignment with the CCAP
officers at all Ministries and Departments.	mechanisms accessible to Saint Lucia's government and, c) building a climate adaptation proposal (hands-on preparation of a log frame and concept note for submission to a funding source). - Training on project proposal development, specifically targeting GCF delivered	

6. SECTORAL ADAPTATION PRIORITIES

This section summarises the challenges faced by the development sectors/areas prioritised in 2017 by stakeholders as being the most vulnerable to climate change impacts and in most urgent need of adaptive action in Saint Lucia and, additionally includes a sub-section on tourism. Sector-specific measures, identified as urgent priorities for adaptation during previous consultation processes and confirmed as current needs during the NAP consultations, are also presented. It is the intention to set initial broad sectoral plans of action to be implemented, while funding is secured for the development of detailed SASAPs, which will then become the blueprints for sectoral adaptation in the country. While most measures fall within the realm of one sector, some offer adaptation benefits to, or need to be implemented by, more than one sector and are thus presented as priorities for each of the main sectors involved.

Given the role of DSD as Saint Lucia's Climate Change Focal Point, it is envisaged that as far as is practical, this entity is expected to play a coordinating, facilitating, mobilising and enabling role, as necessary, in collaboration with the lead institution(s), recognising also, the coordinating role of the inter-agency NCCC. The NAP's sectoral measures include some measures that are already being pursued in part or in full. Alignment, consistent with the CCAP* (see footnote in this page **and Annex 3**), is indicated. A list of potential climate impacts for each priority sector is offered in **Tables 1 to 8.**

* Saint Lucia CCAP is supported by three types of adaptation processes (facilitation, implementation and finance).

Facilitation encompasses activities that provide the enabling environment and enhance adaptive capacity; for example in awareness- and capacity-building, institutional and governance structures, policies and legislative frameworks, fiscal and economic incentives, knowledge management and dissemination and others, thereby improving conditions for the capacities and awareness at all levels of society.

Implementation encompasses activities geared towards building the resilience of households, communities, vulnerable groups, enterprises, sectors and, ultimately, the nation. Implementation measures will therefore be identified at the national and community levels, with regional and international support and backstopping provided through agreed modalities.

Financing options are linked to one or more of the following five categories: 1. Affordable climate change-related loan financing for civil society and the general public; 2. Economic Incentives; 3. Private Sector Financing; 4. International Funding; 5. Mechanisms to realise sustainable financing for climate change adaptation. These options will be supported by an enabling fiscal regime.

7. WATER

Water is essential for life on Earth and is inextricably linked to development. Water supports ecosystems, human needs, traditional livelihoods, industrial and economic activities. However, unsustainable development pressures and climate change threaten the availability and quality of freshwater resources and have the potential to jeopardise hard-won development gains and the prospects of future economic growth in vulnerable countries.

Due to the cross-cutting nature of water, water-mediated climate change impacts are expected to affect, directly and indirectly, all development sectors in Saint Lucia, with serious implications for the island's population and economy. Through changes in temperature and in the amount, predictability and intensity of rainfall, climate change imperils the availability and provision of freshwater for domestic purposes, industry, agriculture, tourism, human health and even financial services. Flooding could increase the incidence of water and vector-borne diseases (such as dengue), and malnutrition could increase due to water-related impacts on food production. Further, stronger seasonal rains and hurricanes, more frequent landslides, flooding and coastal erosion will test the resilience of the island's infrastructure, livelihoods and emergency response systems. In consequence, securing the country's economic growth and development in the near, medium and long-term requires a good understanding of existing and emerging water-related challenges and of their common and cascading effects across sectors., But, also requires the collaboration of all relevant stakeholders in strategically planning and implementing urgent actions to build climate resilience in the water sector. Of key relevance are actions geared towards protecting the integrity of freshwater resources, ensuring adequate water supply and protecting lives, health and property.

The Water Resources Management Agency (WRMA) is the lead institution for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT AND IMPROVED BEHAVIOUR FOR WATER-RELATED CLIMATE ADAPTATION ACTION

STRATEGIC OBJECTIVE 1. IMPROVE THE NATIONAL POLICY, LEGAL AND REGULATORY FRAMEWORK TO FACILITATE CLIMATE ADAPTATION IN THE WATER AND WATER-DEPENDENT SECTORS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
41	Develop a new 20-year Integrated Water Resources Management Strategy for Saint Lucia (incorporating water conservation and allocation strategies and climate change and other priorities in the Water SASAP).	New 20-year Water Resources Management Strategy for Saint Lucia formulated, integrating climate change considerations and including water conservation and allocation strategies as defined in the Water SASAP).	Facilitation
42	Revise development standards / guidelines and integrate climate adaptation considerations for the water sector ("make them climate-smart" e.g. river/ravine buffers; requirements for open spaces and conservation reserves).	Development standards/guidelines revised and including climate change adaptation considerations.	Facilitation
43	Revise the current Water, land and other policies to address climate change challenges and integrate coherently climate adaptation considerations.	Water, Land and other policies (which may affect water resources or their management) revised and addressing both, climate change challenges and climate adaptation considerations.	Facilitation
44	Revise government policy on water conservation incentives and water price controls to increase water use efficiency.	Government policy on water conservation incentives and water price controls to increase water use efficiency revised, approved and enforced.	Facilitation

STRATEGIC OBJECTIVE 2. SCALE-UP NATIONAL HUMAN CAPACITY FOR THE DESIGN AND IMPLEMENTATION OF WATER-RELATED CLIMATE ADAPTATION PROJECTS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
45	Establish human resource and training expertise in NGOs and CBOs to support natural resource management, and water quality monitoring.	Training workshops, courses and hands-on learning activities for NGOs and CSOs to support government-led and other water resource management and water monitoring activities.	Facilitation

STRATEGIC OBJECTIVE 3. INCREASE PUBLIC AWARENESS TO INTEGRATED WATER RESOURCE MANAGEMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
46	Design and implement a communications strategy for raising awareness and sparking action on integrated water resource management under a changing climate at all levels of the Saint Lucian Society.	Communications and awareness raising strategy to raise public awareness on integrated water resource management, including integrated watershed management, water efficiency, wastewater management and other relevant thematic areas designed, in alignment with the Climate Change Communications Strategy (2018), funded, implemented and reaching all levels of the Saint Lucian Society.	Facilitation and implementation

OUTCOME 2. INCREASED WATER ACCESS, AVAILABILITY AND QUALITY

STRATEGIC OBJECTIVE 1. STRENGTHEN INTEGRATED WATERSHED MANAGEMENT TO BUILD CLIMATE RESILIENCE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
47	Conduct a Feasibility Study to establish river usage zoning to reduce water use conflicts and secure the integrity of river water quality.	Feasibility study establishing river usage zoning.	Facilitation
48	Undertake a comprehensive study of the 37 watersheds and all water resources in Saint Lucia to develop a comprehensive water resources database, hydrological models and a reporting system.	- Study report of Saint Lucia's water resources including all relevant information on the country's watersheds. - Water resources database - Reporting system.	Facilitation and implementation
49	Improve river bank management and water quality by introducing and maintaining riparian buffer zones/strips and/or selectively re-introducing river reserves	- Riparian buffer zones introduced and maintained. - River reserves introduced.	Implementation
50	State acquisition and maintenance of private water catchments and intact natural forests	- Plan for State acquisition of private water catchments and intact natural forests formulated, including funding mechanisms for its implementation. - Plan implementation initiated. - Private water catchments and natural forests purchased by the state and maintained.	Implementation
51	Expand reforestation programmes, prioritising the reforestation of critical watersheds (with selection of appropriate mixes of species for reforestation/ afforestation where needed)	New or expanded existing reforestation programmes in critical watersheds implemented and or planned	Implementation
52	Adopt forest management plans to reduce and control soil erosion, sedimentation of water sources and to minimise the risk of landslides	Forest management plans in place and implemented	Facilitation and Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
53	Identify new and expand sustainable forest-based livelihood opportunities for securing forest cover and ecosystem health	- Study on sustainable forest livelihoods for Saint Lucia, identifying marketable products (including non-timber forest products) and services (e.g. eco-tourism), value chain and market analyses. - Training on the identified sustainable forest livelihoods for beneficiaries	Facilitation and Implementation
54	Activate or reactivate Community-based Organisations for integrated watershed / natural resource management	- CBOs mobilised, informed and trained on sustainable natural resource management practices (including sustainable land management practices). - Mechanisms to phase out activities which compromise water quality and take place next to water sources identified and agreed with CBOs and communities. - Mobilised CBOs actively participate in designing and planning natural resource management and sustainable land use projects in their watersheds - CBOs mobilise watershed communities to implement sustainable natural resource management projects and to adopt sustainable land management practices in water catchments.	Implementation
55	Phase out inappropriate activities (for example agricultural, commercial, industrial, domestic, etc.) which compromise water quality and take place adjacent to water sources.		Facilitation and implementation
56	Mobilise communities to implement sustainable land use practices in water catchments.		Implementation
57	Continue/accelerate the selective relocation of water intakes	Water intakes relocated to suitable areas, taking into consideration climate change and land/agricultural use (pollution)-related risks.	Implementation
58	Use engineering measures for river bank and channel protection, where necessary	- Technical feasibility study identifying priority areas for engineering solutions to flooding along river banks and channels. - Implementation of engineering solutions in identified priority areas.	Facilitation and Implementation
59	Review the National Land Use Plan to ensure that it: a) addresses watershed degradation, saline intrusion, sea level rise and groundwater use and, b) encourages a well-planned intensive use of land vs. the lateral spread of development, to secure increased land availability for conservation purposes	- National Land Use Plan reviewed and addressing watershed degradation, saline intrusion, sea level rise and groundwater and providing guidance on the intensive use of land for development. - Execution of the Revised National Land Use Plan.	Facilitation

STRATEGIC OBJECTIVE 2. PROMOTE THE SUSTAINABLE USE OF ALTERNATIVE WATER SOURCES TO ENSURE WATER AVAILABILITY UNDER A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
60	Promote the use of communal Rain Water Harvesting (RWH) and storage systems for non-potable uses and the retrofitting of private homes and domestic/commercial buildings to include rain water harvesting and storage	- Public campaigns to raise awareness of the benefits of RWH systems. - Training on RWH system construction and maintenance delivered to CBOs and other interested community representatives. - Public buildings retrofitted (including RWH and water storage systems) and used as demonstration projects/sites.	Facilitation and Implementation
61	Expand storage capacity through the strategic placement of bulk water storage tanks (rainwater and potable water)	- Strategic locations for the installation of bulk water storage tanks across the island identified. - Installation of bulk water storage tanks initiated.	Implementation
62	Raise awareness and develop/extend training on the correct maintenance of private water storage	Training delivered to technical officers, local government officials, CBOs and suppliers on the correct maintenance of private water storage	Facilitation and Implementation
63	Test and implement approaches for enhancing water availability, such as dam and reservoir establishment/construction in the south (Troumassee River), desalination plants, micro-dams and the establishment of satellite water storage tanks within the forest reserve to feed rural communities	Pilot projects to test alternative water sources, storm water management and re-use systems designed, funded, implemented and evaluated in terms of effectiveness, applicability, cost-effectiveness and scalability	Implementation
64	Test and implement storm water management and re-use systems		Implementation
65	Continue groundwater resource mapping and exploration for use	New groundwater exploration for use project designed and funded.	Implementation

STRATEGIC OBJECTIVE 3. IMPROVE WASTEWATER MANAGEMENT TO REDUCE POLLUTION AND INCREASE WATER AVAILABILITY UNDER A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
66	Extend Public Sanitation Programmes and improve/upgrade sanitation facilities in vulnerable communities/poor households	Sanitation facilities in vulnerable communities upgraded.	Implementation
67	Revise current regulations to ensure that connections are made to the central sewer where possible and that the construction and maintenance of private septic tanks is appropriate. Develop mechanisms for the enforcement of regulations and establish training sessions (in conjunction with the Police) for the training of enforcement officers	- Regulations revised, and enforcement mechanisms formulated and approved. - Training sessions on the regulations and their enforcement mechanisms delivered to enforcement officers.	Facilitation
68	Conduct a Feasibility Study to determine the infrastructural requirements for tertiary level municipal sewage treatment facilities to cover the island's needs.	Feasibility study conducted to determine the infrastructural requirements for tertiary level municipal sewage treatment facilities to cover the island's needs.	Facilitation and Implementation
69	Raise awareness and develop training on the correct use of grey water	Training sessions on the correct use of greywater delivered to local government officials, CBOs, community leaders and industry representatives.	Facilitation and Implementation
70	Install new, upgrade and extend existing waste water treatment facilities	- Plan for installing new and upgrading existing wastewater treatment facilities. - Feasibility studies and Environmental Impact Assessments (EIAs) for the installation of new wastewater treatment facilities. - Existing wastewater treatment facilities upgraded. - New wastewater treatment facilities designed.	Implementation
71	Upgrade EIA for tourism waste water plants to include hazard risk assessments and vulnerability analyses	EIAs updated and integrating hazard risk assessments and vulnerability assessments (including climate change risk and vulnerability considerations).	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
72	Promote and implement wastewater re-use programmes, including the recycling of grey water and sludge management at hotels and other large institutions	Training session on wastewater and reuse treatments for the recycling of wastewater and sludge management (including regulations and benefits under a changing climate) delivered to members of the Saint Lucia Hotel and Tourism Association and other commercial institutions.	Facilitation and Implementation
73	Regulate the use of grey water and grey water products	- Regulations for the use of greywater and greywater products. - Regulation enforcement mechanisms formulated and set-up. - Training on the regulations for enforcement officers conducted.	Facilitation

STRATEGIC OBJECTIVE 4. SET AND SCALE-UP WATER QUALITY AND POLLUTION CONTROL IN A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
74	Develop and enforce potable water quality standards	- Potable water quality standards developed and approved. - Standard enforcement mechanisms formulated and implemented.	Facilitation
75	Build capacity for water quality monitoring by improving and staffing the Water Resources Monitoring Programme to identify yield and water quality issues in each supply area and by re-establishing the Water Testing Laboratory	- Plan for strengthening water resource monitoring in Saint Lucia formulated and including: a) an analysis of existing technical, financial, infrastructural (equipment) and logistical and limitations in the Water Resource Monitoring Program. b) an analysis of the cost-effectiveness of re-establishing the Water Testing Laboratory vs. other alternatives and, c) implementation mechanisms (including funding sources) and timeline for action. - Capacity building activities to strengthen the identified technical weaknesses in water monitoring delivered.	Facilitation
76	Implement waste-to energy projects to increase the availability of non-polluted water (though reduction in water	- Proposal for implementing waste-to energy pilot projects designed and submitted for funding. - Pilot projects undertaken	Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
	pollution/contamination by liquid/organic waste) and to reduce the compounded effects of flooding by solid waste		
77	Develop guidelines for the handling, transportation and storage of chemicals and chemical waste; managing accidents and spills; and the use and disposal of chemicals in order to safeguard water resources	Guidelines for the handling, transportation and storage of chemicals and chemical waste; managing accidents and spills; and the use and disposal of chemicals.	Implementation
78	Conduct an assessment of hazardous chemical storage facilities of the Saint Lucia Air and Sea Ports Authority (SLASPA) with options for improvement of storage infrastructure	Assessment conducted, taking into consideration climate change concerns and report produced, including a plan for enhancing climate resilience and improving inadequate storage infrastructure.	Facilitation and Implementation
79	Review and update the classification of pesticides and chemical products of concern in the legislation.	Legislation related to the classification of pesticides and chemical products of concern reviewed and updated, including an effective mechanism for the continuous updating and including (in the relevant legislation) chemicals and chemical products of concern.	Facilitation
80	Implement red-flagging of pesticides and chemical products in the Automated System for Customs Data (ASYCUDA) World. Red flags are to be triggered every time the HS codes for banned products are entered into ASYCUDA World by a Customs Officer or Broker to activate a secondary inspection	- Red-flagging of pesticides and chemical products in the ASYCUDA World implemented. - Training on the system and procedures after banned products are flagged delivered to Customs Officers and Brokers	Implementation

OUTCOME 3. INCREASED WATER EFFICIENCY AND CONSERVATION

STRATEGIC OBJECTIVE 1. IMPROVE WATER INFRASTRUCTURE TO BUILD CLIMATE RESILIENCE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
81	Facilitate investment and invest in major water system infrastructural upgrades, including the construction of new pipelines to reduce water loss	- A comprehensive assessment of all water system infrastructure upgrades and extension required across Saint Lucia conducted. The assessment should: a) analyse current and projected future demand and place emphasis on interventions required in areas lacking individual connections and in areas with significant leaks. b) integrate climate change considerations and recommendations based on climate change projections (climate proofing of existing and new water infrastructure), c) include a Plan of Action (including water infrastructure improvements and extension, leak control measures -meter installation and capacity building for leak detection- and improvement of WASCO's operational plans), d) provide a budget and potential (national and international) funding sources for the Plan's (full or partial) execution. - The assessment report and Plan of action is considered in national budgets, and additional funding is secured to start and advance the Plan's implementation. - Priority infrastructural interventions undertaken. - WASCO's Operational Plans updated and under execution. - Meters purchased and installed - Capacity building activities for reducing leaks undertaken. - Customer base with individual connection increased. - Standpipes and communal supplies reduced. - Leaks reduced.	Facilitation and implementation
82	Increase customer base with individual connection and reduce standpipes and communal supplies		Implementation
83	Improve leak detection and alleviation to reduce losses including an improvement of WASCO's operational plans and institutional capacity to reduce line losses.		Implementation
84	Purchase meters and install along water distribution network to quantify total losses and assess leakage within the network/ reservoirs. Address areas that show high leakages		Implementation
85	Install water meters for all consumers (bulk and low volume)		Implementation
86	Conduct water audit of government buildings and government-occupied buildings to determine where there are high leakages/wastage	- Audit performed. - Key public and community buildings retrofitted and used as demonstration sites.	Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
87	Retrofit public and key community buildings for climate change resilience and for demonstration/replication of climate-appropriate design re – rainwater harvesting and hurricane resilience		Implementation
88	Facilitate the development of renewable energy infrastructure to reduce current water pumping costs	- Projects for the development of renewable energy infrastructure for reducing the costs of water pumping designed and submitted for funding	Implementation

Strategic objective 2. Encourage water efficiency under a changing climate by improving water pricing, water utility revenue and water conservation incentives

	Adaptation measures	Indicative outputs	Alignment with the CCAP
89	Design and implement an adequate water and wastewater tariff system (adjusting rates to accurately reflect costs of water supply)	- Study analysing Saint Lucia's water service tariff and revenue collection system. The study should consider current and forecasted demand and water supply and treatment costs (including climate change-related variation in demand and costs). The study should propose adequate adjustments to the water and wastewater tariff system, including the potential adjustment of dry season charges and provide recommendations on a more effective revenue collection system. - Adjusted water and wastewater tariff and revenue collection systems approved and implemented.	Facilitation and Implementation
90	Implement dry season premium water charge for excessive use of water		Facilitation and Finance
91	Improve the efficiency of water revenue collection		Facilitation and Finance

	Adaptation measures	Indicative outputs	Alignment with the CCAP
92	Establish water conservation incentives for private and community-based water conservation programmes	- Most effective water conservation incentives for private and community-based conservation programmes identified and approved. - Incentive system established implemented.	Facilitation
93	Promote the adoption of low flow water technologies for domestic use (e.g. toilets and faucets)	- Market assessment of domestic water conservation products conducted, presented to and discussed with importers/suppliers. - Price caps discussed to ensure affordability and adoption of the technologies. - Incentives approved for motivating the adoption of water conservations systems at the domestic and commercial level. - Public awareness raising campaigns on the benefits of water conservation systems under current and future climate, including the use of low flow technologies designed and conducted (these campaigns could be linked to the NAP communications strategy) - Availability, purchase and installation of domestic water conservation devices increase.	Facilitation
94	Encourage the private sector to increase the availability of domestic water conservation products for purchase by the public in Saint Lucia		Facilitation and implementation
95	Create/increase awareness-raising campaigns to promote the efficient and effective use of water (including water conservation practices) for climate change adaptation amongst landowners, farmers and the public in general		Facilitation and Implementation

STRATEGIC OBJECTIVE 3. PROMOTE CLIMATE SMART AGRICULTURE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
96	Document best practices in dryland agriculture in the Caribbean	Comprehensive document on Caribbean dryland and climate-smart agriculture prepared. The document reviews soil and water conservation measures, includes case studies and offers crop production recommendations for Saint Lucia, considering climate change projections.	Implementation
97	Change management practices such as planting dates to compensate for crop /water cycle modifications	Climate-smart agricultural practices tested and adopted.	Implementation
98	Improve farm drainage infrastructure, cultivation and harvesting practices to reduce impacts of soil water stress during heavy precipitation periods	- A programme for improving farm drainage infrastructure and developing climate-smart irrigation systems (allowing for the recycling of wastewater) is designed and submitted for funding. - Pilot testing of soil and water conservation and water-efficient agricultural practices in demonstration plots takes place. - Farmer field schools design and offer training on climate-smart-agricultural practices to farmers, using the demonstration plots and in an ongoing basis.	Implementation
99	Extend drip irrigation use and develop irrigation networks that allow for the recycling of waste water		Implementation
100	Extend the use of soil and water conservation measures (mulching, appropriate terracing, etc.) to reduce water losses and erosion		Implementation
101	Set up demonstration plots showcasing climate-smart farming techniques. Facilitate farmers training on climate smart agriculture through farmer field schools.		Implementation
102	Review agricultural support mechanisms and policies to promote water efficient production methods and techniques.	Review conducted.	Facilitation

OUTCOME 4. STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES

STRATEGIC OBJECTIVE 1. IMPROVE HYDROMETEOROLOGICAL MONITORING, EMERGENCY PLANNING AND DECISION MAKING

	Adaptation measures	Indicative outputs	Alignment with the CCAP
103	Undertake country-wide hazard mapping (flooding, drought, wildfires, landslides, digital elevation modelling) to inform land use and infrastructure development planning	Multi-hazard risk maps for Saint Lucia developed and in use.	Implementation
104	Enhance existing monitoring/alert networks on sea level rise through effective training and outreach mechanisms	-Capacity building programme for improving sea-level rise monitoring and alert networks designed and delivered.	Implementation
105	Continue expanding the network of automatic rainfall stations and stream gauges with data loggers to remotely transmit readings to a central office and improve early warning systems	- Automatic rainfall stations and stream gauges with data loggers installed and transmitting readings to a central office. - Existing early warning systems adjusted accordingly.	Implementation
106	Identify and acquire appropriate predictive rainfall and flood (coastal and inland) models and provide in-depth training and capacity building on their use and analysis complementary to, and beyond, the Hydromet Rehabilitation component of the Disaster Vulnerability Reduction Project (DVRP)	- Adequate flood and rainfall predictive models for Saint Lucia acquired. - Training on the use of the models and the analysis of derived data delivered to Meteorology Office staff.	Facilitation and Implementation
107	Train staff in GIS, satellite image analysis, meteorological data analysis, predictive analysis, and use of satellite and remote sensed data and systems	- Comprehensive capacity building programme designed for technical officers of relevant ministries and departments. - Capacity building programme delivered.	Facilitation and Implementation

STRATEGIC OBJECTIVE 2. MINIMISE WATER-RELATED CLIMATE CHANGE RISKS BY ADOPTING ECOSYSTEM-BASED ADAPTATION SOLUTIONS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
108	Maintain existing vegetative buffers – mangroves, coastal vegetation, river banks - through regulations and enforcement	Wetlands and main vegetative buffers along riverbanks and coasts are protected and restored through regulations and enforcement.	Facilitation
109	Protect wetland ecosystems, most of which are coastal and have been targeted as landfill sites or earmarked for development		Facilitation

STRATEGIC OBJECTIVE 3. PROMOTE CLIMATE RESILIENT BUSINESS DEVELOPMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
110	Encourage the development of business continuity plans (including water supply considerations) for dealing with the impacts of climate change through the creation of certification schemes for businesses that have implemented business continuity measures	- Certification schemes designed and implemented. - Meetings held with private sector associations and leaders to inform them about the schemes.	Facilitation

8. AGRICULTURE

Agriculture is highly exposed to the impact of climate-related hazards, with extended drought, flooding and other weather extremes (including tropical storms), causing substantial damage and exacerbating soil degradation (erosion) processes. For example, the drought of 2010 and 2011 accounted for a reduction of 15% in banana exports during the first semester of 2010 alone. Hurricane Tomas, also in 2010, caused damages of around XCD $151.8 million (approximately USD 56.9 million) in the agricultural sector. The flooding, and to a lesser extent, the winds of the hurricane, destroyed entire banana fields and reduced production in the following years. Although various projects, grants and subsidies were initiated by the government to support the affected farmers, the agricultural sector is still recovering from the effects of the hurricane.

Climate change is expected to affect Saint Lucia's agricultural production, mainly through the direct effects on crop production of increasing temperatures, changes in precipitation patterns (including more frequent and intense drought episodes), increasing storm intensity (and flooding) and high winds. With higher temperatures, climate change could also increase water demand (and reduce supply with more frequent drought) and increase the incidence of pests, weeds and disease. With changes in temperature and precipitation, shifts in the crop suitability of agricultural land are also to be expected. In addition, longer dry periods and more torrential rains could aggravate land degradation processes (erosion) and increase the risk of landslides in steep areas. An analysis of the economic and social impacts of climate change in the Caribbean (Hutchinson et al, 2013)[22] shows that the yields of bananas and plantains in the region could decline between 12 and 20% by the 2020s and between 20 and 32% by the 2050s, which can be considered an indication of the challenges that traditional crop agriculture will face in the future.

The Department of Agriculture is the lead institution for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR CLIMATE ADAPTATION ACTION IN THE AGRICULTURE SECTOR

STRATEGIC OBJECTIVE 1. IMPROVE THE NATIONAL LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK TO FACILITATE CLIMATE ADAPTATION IN THE AGRICULTURE SECTOR

	Adaptation measures	Indicative outputs	Alignment with the CCAP
111	Integrate SLR and land use strategies into the Agriculture Policy Framework and Strategy (2016 to 2021)	- Assessment study on expected sea-level rise impacts and associated land use strategies for Saint Lucia conducted and used to inform appropriate changes to the draft Agriculture Policy Framework and Strategy - SLR and land use strategies incorporated into the Agriculture policy and Strategy.	Facilitation
112	Implement Land Policy to enable land zoning to safeguard quality agricultural lands and identify lands best suited for the production of specific crops	- Study to determine land suitability for key crops conducted and used to inform the implementation of the Land Policy. - Roadmap to implement the Land Policy developed and endorsed. - Lobby undertaken for the endorsement and implementation of the Land Policy.	Facilitation
113	Relocate production areas/farms to lands with high agricultural capability and productivity	- Assessment on the needs, gaps, opportunities and challenges for the relocation of production areas/farms to lands with good agricultural capability conducted and endorsed. - Trials conducted with farmers to relocate production areas/farms to lands with good agricultural capability.	Facilitation and implementation
114	Recover and improve abandoned agricultural lands including diversification	- Mapping of abandoned agricultural lands conducted. - Study analysing opportunities to utilise, improve and recover these lands conducted.	Facilitation
115	Revise, update and enforce regulations to govern the production of crops and livestock adjacent to aquifers and waterways based on best practices	Regulation to govern the production of crops and livestock adjacent to waterways assessed, revised, updated and enforced.	Facilitation

STRATEGIC OBJECTIVE 2. STRENGTHEN RESEARCH AND DEVELOPMENT IN CLIMATE RESILIENT AGRICULTURE TO IMPROVE ACCESS TO CLIMATE RESILIENT VARIETIES AND LOCAL INPUTS (ORGANIC FERTILISER AND NATURAL PESTICIDES)

	Adaptation measures	Indicative outputs	Alignment with the CCAP
116	Establish an "Enhanced-Value Chain Business Development Centre" to develop and promote Climate Resilient Agriculture (CRA) best practices and businesses (e.g. Soufriere, Region 6)	Enhanced-Value Chain Development Centre to develop and promote CRA best practices and businesses (e.g. Soufriere) selected, established and operational.	Facilitation and implementation
117	Study and implement agro-biodiversity benefits (e.g. mixed species planting, intercropping, beneficial plants that attract beneficial insects)	- Study on the agro-biodiversity benefits in strengthening farm resilience, yield and farmers' income conducted, published and disseminated. - Awareness raising campaigns on the benefits of agro-biodiversity, based on the study conducted. - Communication products and services developed and published to train farmers on agro-biodiversity practices and raise awareness of the benefits of their benefits among value chain actors.	Facilitation and Implementation
118	Conduct research on environment friendly and integrated pest/disease management systems for crops and livestock. Research produce and market natural pesticides (e.g. indigenous entomo* -pathogenic fungi) as alternative to imported chemicals	- Research on environment friendly and integrated pest/disease management systems for crops and livestock and the production and marketing of natural pesticides (e.g. indigenous entomo-pathogenic fungi) conducted. - Best environment-friendly pest/disease management systems identified piloted and commercialised. - Awareness raising campaign on the hazards of chemical pesticides conducted.	Facilitation and Implementation

* Of an insect.

	Adaptation measures	Indicative outputs	Alignment with the CCAP
119	Introduce/adapt and promote the cultivation and conservation of alternative/diversified and climate resilient varieties of crops, animals and pastures	- Alternative/diversified and climate resilient varieties of crops, animals and pastures identified or developed/introduced and tested. - Production and marketing strategies for the best alternative crops, animals and pastures developed and implemented.	Facilitation and Implementation
120	Introduce alternative heat and drought tolerant crop varieties; crop varieties with a higher harvest index (improving water use and irrigation efficiency); non-transgenic, where possible	- Alternative heat and drought resistant crop varieties; crop varieties with a higher harvest index (making irrigation more effective) introduced, tested and promoted. - Risk assessment conducted, and regulations established if genetically modified varieties are used. - Production and marketing strategies for the best alternative crops, animals and pastures developed and implemented.	Facilitation and Implementation
121	Sustainably cultivate and conserve heirloom species	- Study on heirloom species in Saint Lucia conducted. The study should include a list of heirlooms, the conditions under which the species grow/are grown and suitable areas for production, an analysis of the market potential for the most promising (and marketable) species/varieties as well as recommendations for their sustainable cultivation. - Pilot tests of sustainable heirloom cultivation based on the recommendations of the study conducted. - Training on sustainable heirloom cultivation delivered to interested farmers.	Facilitation and Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
122	Introduce/adapt for cultivation of more salt-tolerant/resistant crops and pastures	- Study to identify, multiply and market more salt-tolerant/resistant crops and pastures conducted, endorsed and published. - Risk assessment conducted, and regulations established if genetically modified varieties are used. - Production and marketing strategies developed and operational.	Facilitation and Implementation
123	Promote and implement in-situ and ex-situ conservation measures for vulnerable agricultural species	- Study to identify and protect vulnerable agricultural species conducted - Programme to establish in-situ and ex-situ conservation measures for vulnerable agricultural species developed and executed.	Facilitation and Implementation
124	Establish germplasm of hardy native species/underutilised indigenous species (herbal/medicinal) to be used for habitat or species restoration (agro-forestry measure)	- Study to identify and improve hardy native species/underutilised indigenous species (herbal/medicinal) to be used for habitat or species restoration conducted and endorsed. - Germplasm bank of hardy native species/underutilised indigenous species (herbal/medicinal) established.	Facilitation
125	Strengthen quarantine services, monitor, control and where possible eradicate invasive species	- Study to monitor, control and regulate (quarantine) invasive species to reduce competition conducted, and disseminated. - Knowledge and communication products and services developed and published to train and raise awareness for farmers and value chain actors.	Facilitation and Implementation
126	Improve soil testing and apply corresponding soil amelioration measures (e.g. leaching with fresh water)	- Facilities for soil testing equipped and staffed - Technical and financial feasibility study on the research to apply on soil amelioration measures (e.g. leaching with fresh water) conducted and reported	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
127	Develop and adopt alternative production systems such as aquaculture, mariculture, hydroponics and aquaponics following CRA best practices	- Barriers for the scaling up of alternative production systems such as aquaculture, mariculture, hydroponics and aquaponics studied and identified. - Financial and business models to scale up alternative production systems such as aquaculture, mariculture, hydroponics and aquaponics developed, tested, adopted and scaled up. - Feasibility study to use solar for pumping and fertigation* to reduce operation cost tested and promoted.	Facilitation and Implementation

STRATEGIC OBJECTIVE 3. ENHANCE HUMAN AND INSTITUTIONAL CAPACITY FOR THE DESIGN, IMPLEMENTATION, MONITORING AND EVALUATION OF AGRICULTURE-RELATED CLIMATE ADAPTATION PROJECTS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
128	Set up demonstration plots showcasing climate resilient farming techniques. Facilitate farmers training on climate resilient agriculture through farmer field schools. Develop training for new and existing extension officers using non-private lands or Memoranda of Understanding.	- Demonstration plots showcasing climate resilient farming techniques established and operational. - Farmers training on climate resilient agriculture facilitated through farmer field schools. - Knowledge and communication products and services developed and promoted. - Training for new and existing extension officers conducted and certified.	Facilitation and Implementation

* Injection of fertilisers, soil amendments, and other water-soluble products into an irrigation system.

OUTCOME 2. ENHANCED NUTRITION, FOOD AVAILABILITY, QUALITY AND SECURITY THROUGH ADAPTATION IN THE AGRICULTURE SECTOR

STRATEGIC OBJECTIVE 4. PROMOTE CLIMATE RESILIENT CROP PRODUCTION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
129	Strengthen implementation of Good Agriculture Practices (GAP) and permaculture best practices to strengthen climate change resilience	- Best climate resilience-building permaculture and GAP identified, developed, improved and adopted by farmers. - Knowledge and communication products and services to train and raise awareness on these practices among farmers and value chain actors developed and published.	Implementation
130	Adopt CRA best practices to extend the use of soil and water and energy-efficient conservation measures (mulching, appropriate terracing, drip irrigation, solar pump, wind power, etc.) to reduce water losses and erosion	- CRA best practices to extend the use of soil and water conservation measures (mulching, appropriate terracing, drip irrigation, solar pump, etc.) and reducing water losses and soil erosion identified, tested, promoted and adopted by farmers - Knowledge and communication products and services to train and raise awareness for value chain actors developed and used	Implementation
131	Develop, test and scale up (through viable financial business models) technologies for controlled environment production (e.g. cold frames*, greenhouses/polytunnel** with plastic and polycarbonate)	- Controlled environment production technologies appropriate for Saint Lucia, identified, developed/adapted, tested and adopted. - Viable business models established for engaging the private sector in the production/import of the elements required for the technologies. - Competitive financial products and services established to scale up the adoption of technologies by farmers.	Implementation

* Transparent-roofed enclosure, built low to the ground, used to protect plants from adverse weather, primarily excessive cold or wet.

** Tunnel typically made from steel and covered in polythene, usually semi-circular, square or elongated in shape.

	Adaptation measures	Indicative outputs	Alignment with the CCAP
132	Adopt, cultivate and market alternative cash crops (e.g. fat poke, cashew, beets, dwarf coconuts)	- Study for the identification of promising alternative cash crops conducted. - Most promising alternative cash crops tested and promoted for farming livelihood diversification, and income.	Facilitation and Implementation
133	Improve cropping sequences for short term crops in collaboration with farmer networks	Study to test various cropping sequences for short term crops undertaken, best results disseminated and promoted.	Facilitation and Implementation
134	Identify and adopt alternative agricultural management practices that improve water efficiency of livestock	Alternative agricultural management practices that improve water efficiency of livestock are identified, tested and scaled up.	Implementation

STRATEGIC OBJECTIVE 5. PROMOTE CLIMATE RESILIENT LIVESTOCK PRODUCTION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
135	Develop, adopt and scale up feed conservation techniques e.g. zero grazing for livestock (use of “cut and carry” technique or imported feed) and fodder banks to reduce need for extensive grazing and potential for soil erosion	- Feed conservation techniques e.g. zero grazing for livestock (use of “cut and carry” technique or imported feed) identified and promoted. - Fodder banks to reduce need for extensive grazing and potential for soil erosion established and operational.	Implementation
136	Develop, promote and implement the most cost effective semi intensive production systems (e.g. rotational grazing) to encourage pasture growth and organic matter production for improved pasture productivity and heat stress reduction (shade trees/shed, sprinklers)	- Study conducted to identify the most appropriate and cost-effective efficient semi intensive production systems (e.g. rotational grazing) to encourage pasture growth and organic matter production in Saint Lucia. - Most appropriate production systems promoted and adopted by farmers for improving productivity of pasture lands and reducing heat stress (shade trees/shed, sprinklers.	Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		- Effectiveness of the semi intensive production systems implemented monitored.	
137	Develop, adopt and scale up climate resilient pasture management e.g. alter stocking distribution using watering points and fences, fodder banks	Climate resilient pasture management practices tested, and disseminated among livestock farmers with support from extension officers.	Implementation

STRATEGIC OBJECTIVE 6. STRENGTHEN RESILIENCE AND ECOSYSTEM SERVICES THROUGH INTEGRATED SUSTAINABLE LAND AND WATERSHED MANAGEMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
138	Adopt a watershed management planning approach for zoning (e.g. within agroforestry system)	Watershed management planning approach for zoning (e.g. within agroforestry system) adopted, promoted and scaled up.	Implementation

STRATEGIC OBJECTIVE 7. ADVANCE WATER SUPPLY SIDE MANAGEMENT BY IMPROVING RAINWATER HARVESTING AND WATER STORAGE INFRASTRUCTURE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
139	Construct climate resilient infrastructure to improve water supply and storage for crops and livestock production (e.g. dams, water storage tanks) and improve farm drainage infrastructure, storm drains, cultivation and harvesting practices to reduce impacts of soil waterlogging stress during heavy precipitation periods	Infrastructure to improve water supply and storage for crops and livestock production (e.g. dams, water storage tanks) constructed/installed and operational through programmes designed to promote climate resilient farming. The programmes should also consider improving farm drainage infrastructure.	Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
140	Adopt new water capture technologies and retrofit damaged water infrastructure (e.g. dams, ponds and swales for rain water harvesting, groundwater abstraction) for use in agriculture	New water conservation technologies and damaged water infrastructure (e.g. dams, ponds and swales for rain water harvesting) assessed, costed, installed, retrofitted, operational and scaled up.	Implementation

STRATEGIC OBJECTIVE 8. SCALE UPWATER DEMAND SIDE MANAGEMENT BY IMPROVING WATER AND SOIL CONSERVATION BEST PRACTICES

	Adaptation measures	Indicative outputs	Alignment with the CCAP
141	Scale up irrigation systems with high water efficiency and water-conserving technologies	Irrigation systems with high water efficiency and water-conserving technologies assessed, developed, installed, operational and scaled up.	Implementation

STRATEGIC OBJECTIVE 9. PROMOTE SUSTAINABLE WASTEWATER MANAGEMENT BY REDUCING, REUSING AND RECYCLING OF AGRO-WASTE RESOURCES

	Adaptation measures	Indicative outputs	Alignment with the CCAP
142	Scale-up and develop sustainable waste management system for crop and livestock production	Sustainable Waste Management Systems to reduce, recycle, reuse waste from crop and livestock production developed, operational and scaled up.	Implementation

OUTCOME 3: STRENGTHENED PARTNERSHIPS FOR SCALING UP CLIMATE RESILIENT AGRICULTURE

STRATEGIC OBJECTIVE 10. FORGE A STRONG PUBLIC PRIVATE PARTNERSHIP TO SCALE UP CLIMATE RESILIENT AGRICULTURE BEST PRACTICES AND BUSINESSES

	Adaptation measures	Indicative outputs	Alignment with the CCAP
143	Facilitate the development of partnerships for active involvement of the private sector in community climate resilience building (e.g. agriculture insurance)	Assessment study on the needs, gaps, opportunities and challenges in leveraging private sector resources and investment in community climate resilience building (e.g. agriculture insurance) conducted, with recommendations taken up and partnership models tested.	Facilitation and Finance
144	Design and implement national programme or a system to promote Corporate Social Responsibility (CSR) of the private sector (e.g. Adopt a Community)	Assessment study on the needs, gaps, opportunities and challenges of the design and implementation of a national programme or a system to promote private sector-CSR (e.g. Adopt a Community) conducted, recommendations accepted and endorsed.	Facilitation and Finance

STRATEGIC OBJECTIVE 11. LEVERAGE PRIVATE SECTOR RESOURCES BY IMPROVING ACCESS TO RESILIENT FINANCIAL AND BUSINESS SUPPORTS AND BEST PRACTICES FOR SCALING UP CROP AND LIVESTOCK PRODUCTION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
145	Improve access to the Climate Change Adaptation Financing Facility and other such initiatives designed to assist farmers (and other vulnerable groups) in building climate resilience and addressing climate change	Study to improve the Climate Change Adaptation Financing Facility and the challenges to scale up to a Climate Change Trust Fund in the context of proposed Environmental Trust Fund conducted and endorsed.	Finance
146	Develop a system to support agriculture enterprises that integrate climate change considerations in their processes through incentives/dis-incentives. Access to competitive financial products and services	- Feasibility study on the needs, gaps, opportunities and challenges to develop a system to support enterprises that integrate climate change considerations in their processes through incentives/dis-incentives conducted and endorsed.	Facilitation, Implementation and Finance

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		- Competitive financial products and services to scale up CRA best practices and businesses developed, promoted and scaled up.	
147	Provide assistance for technology and innovation development for the agriculture private and public sectors	Study to identify assistance needed to develop new technology and innovation for the private and public sectors conducted and endorsed.	Facilitation
148	Support changes in business processes for increased climate and business resilience (e.g. business continuity planning)	Assess the needs, gaps, opportunities and challenges to support changes in business processes for increased climate and business resilience (e.g. business continuity planning) conducted and endorsed.	Facilitation

OUTCOME 4: STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES IN THE AGRICULTURE SECTOR

STRATEGIC OBJECTIVE 12. IMPROVE AGRO-METEOROLOGICAL DATA MONITORING, EMERGENCY PLANNING AND INFORMED DECISION-MAKING

	Adaptation measures	Indicative outputs	Alignment with the CCAP
149	Strengthen existing facilities for soil and water quality testing	- Needs of existing facilities for conducting soil and water quality testing studied and analysed. - Existing facilities for conducting soil and water quality testing improved and operational.	Facilitation and implementation
150	Set up agro-meteorological and forecasting system for the planning of farm activities	Agro-meteorological and forecasting systems established and operational to enable farmers and value chain actors to make informed decisions to adapt to climate change.	Facilitation and implementation

STRATEGIC OBJECTIVE 13. MINIMISE AGRICULTURE-RELATED CLIMATE CHANGE RISKS BY ADOPTING ECOSYSTEM-BASED ADAPTATION SOLUTIONS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
151	Maintain or restore vegetative buffers (e.g. riverine forests)	- Feasibility study to map areas for habitat restoration conducted and endorsed. - Vegetative buffers (e.g. riverine forests, mangroves, sea grapes) maintained or restored to protect agricultural land from flooding, reduce soil erosion and siltation of river courses, and to improve productivity.	Facilitation and Implementation

STRATEGIC OBJECTIVE 14. SCALE UP CLIMATE RESILIENT AGRICULTURAL INFRASTRUCTURE TO REDUCE CLIMATE RISKS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
152	Establish emergency systems and infrastructure for food storage, packaging, processing and food import and distribution in the event of emergency	Emergency systems and infrastructure for food storage, packaging, processing, food import and distribution to cover food shortages during emergencies established and operational.	Facilitation and Implementation
153	Improve systems to reduce post-harvest losses and improve processing, including storage facilities	Systems to reduce post-harvest losses assessed, developed/constructed, improved and operational, including storage facilities.	Facilitation and Implementation
154	Improve, strengthen, adapt, relocate agricultural infrastructure to provide for continuity in services during and post extreme conditions	Climate resilient agricultural infrastructure assessed, costed, improved, strengthened, adapted and relocated to suitable location to provide services during and post extreme conditions.	Implementation
155	Develop national database to store all data on the agriculture sector for decision-making	National agricultural database designed and established.	Facilitation

9. FISHERIES

Saint Lucia's fisheries will also be affected by climate change. The damage and loss of vital fish nursery and breeding habitats, such as coral, mangrove and seagrass ecosystems and the consequent decline in reef fish densities expected with climate change has been already reported. The predicted increase in sea temperature may drive pelagic species away from the tropics in search of cooler temperatures and could potentially alter breeding and migration patterns.[23] Of further concern, is the increase in the frequency of algal blooms that can contaminate some seafood species, and thus impact human health.[24] Further, stronger winds, rainfall events and hurricanes will increase fishing risks.

As Saint Lucia is a major food importer, local, regional and global changes in food production and availability could increase food prices and reduce the access to food for poor and vulnerable segments of the population. With a growing population, ensuring food security and nutrition in the medium and long term will therefore depend on the country's ability to increase food production under a changing climate, which calls for immediate planning and implementation of effective adaptation, not only in its agriculture, but also in its fisheries sector.

The Department of Fisheries is the lead institution for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR CLIMATE ADAPTATION ACTION IN THE FISHERIES SECTOR

STRATEGIC OBJECTIVE 1. IMPROVE THE NATIONAL POLICY, LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK TO FACILITATE CLIMATE ADAPTATION IN THE FISHERIES SECTOR.

	Adaptation measures	Indicative outputs	Alignment with the CCAP
156	Enhance marine and terrestrial spatial planning to help balance fishery and aquaculture needs, terrestrial development and shoreline protection with rising sea level.	Marine and terrestrial spatial planning assessed, improved and endorsed to help balance aquaculture needs, terrestrial development and shoreline protection with rising sea level.	Facilitation
157	Integrate climate change considerations into fisheries and aquaculture policy and national development planning.	Fisheries and aquaculture policy reviewed, analysed and integrated into climate change adaptation and national development planning.	Facilitation
158	Regulate entry into selected fisheries to improve opportunities for increasing economic yield and productivity	Legislation to regulate entry into selected fisheries to improve opportunities for increasing economic yield and productivity developed and enforced	Facilitation

STRATEGIC OBJECTIVE 2. ENHANCE HUMAN AND INSTITUTIONAL CAPACITIES FOR THE DESIGN, IMPLEMENTATION, MONITORING AND EVALUATION OF FISHERIES-RELATED CLIMATE ADAPTATION PROJECTS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
159	Develop and implement capacity building and outreach programmes for fisheries and aquaculture actors in the value chain (e.g. fishers, vendors, business service providers and management agencies) to facilitate holistic climate change adaptation planning and implementation.	Capacity building programmes for value chain actors in the fisheries sector (e.g. fishers, vendors, business service providers and management agencies) regarding climate change, expected impacts and adaptation strategies and to facilitate holistic climate change adaptation planning and implementation, developed and implemented.	Facilitation
160	Design a programme to build the capacity of fishermen to identify fishing grounds (e.g. sharing fish ground mapping; training on GPS use and training on safe night fishing) to reduce fuel use, increase and diversify production	Capacity building programmes for value chain actors in the fisheries sector (e.g. fishers, vendors, business service providers and management agencies) to facilitate holistic climate change adaptation planning and implementation developed and implemented.	Facilitation

OUTCOME 2: ENHANCED NUTRITION, FOOD AVAILABILITY, QUALITY AND SECURITY THROUGH ADAPTATION IN THE FISHERIES SECTOR

STRATEGIC OBJECTIVE 1. IMPROVE PRODUCTIVITY THROUGH CLIMATE RESILIENT FISHERIES MANAGEMENT SYSTEMS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
161	Enhance maritime and coastal fisheries habitats to build resilience (e.g. mangroves restoration, by establishing artificial reefs, propagating and replanting using coral reefs species that are more tolerant to increasing temperature and acidity).	Maritime and coastal fishery habitats restored or artificially enhanced to withstand climate change impacts. Enhancement programmes could include mangroves restoration, artificial reef establishment, propagation and replanting of coral reef species that are more tolerant to increasing temperature and acidity, among others.	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
162	Design and implement a programme of best practices to increase fishing vessel stability and safety at sea e.g. by investing in appropriate vessels that are safer in increasingly rough conditions.	Programme of best practices to increase stability and safety at sea e.g. by investing in appropriate vessels that are safer in increasingly rough conditions developed and operational.	Facilitation
163	Improve knowledge and communication products, services, platforms, networks to raise awareness on fisheries, aquaculture and climate change for risk reduction action	Knowledge and communication products, services, platforms and networks to raise awareness on fisheries and climate change developed and published and disseminated.	Facilitation
164	Evaluate and enhance fisheries management and development polices and plans for climate responsiveness (e.g. based on the changing status of the fish populations due to climate change)	Climate resilient fisheries management and development polices and plans for climate responsiveness (e.g. based on the changing status of the fish populations due to climate change) evaluated, developed, tested, improved and promoted.	Facilitation
165	Improve access to higher-value markets to promote greater benefits from fisheries and aquaculture production to compensate for reduced yields due to climate change (e.g. through the enhancement of Sanitary and Phytosanitary Standards (SPS), innovative infrastructure, supply-demand surveys, value chain analysis, and market intelligence)	Access to higher-value markets evaluated and improved to promote greater benefits from fisheries and aquaculture production to compensate for reduced yields due to climate change (e.g. through the enhancement of sanitary and phytosanitary standards, innovative infrastructure, supply-demand surveys, value chain analysis, and market intelligence).	Implementation
166	Reduce capital, operation and other costs in fisheries and aquaculture by introducing and promoting fuel efficient technologies in response to declining yield and productivity in a changing climate	Fuel efficient technologies and best practices assessed, identified, tested and promoted to reduce capital and operation costs in fisheries and aquaculture in response to declining yield and productivity.	Implementation

STRATEGIC OBJECTIVE 2. PROMOTE CLIMATE RESILIENT AQUACULTURE PRODUCTION IN RESPONSE TO A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
167	Enhance the screening and control of emerging disease in aquaculture in response to changing climate	System for the screening and control of emerging disease in aquaculture developed and promoted.	Facilitation
168	Replace fishmeal and fish oil in aquaculture feed with alternative sources of protein to maintain growth rate in the face of declining wild fish stocks (e.g. research into insect proteins such as black army worm).	Feasibility study to replace fishmeal and fish oil in aquaculture feed with alternative sources of protein to maintain growth rate in the face of declining wild fish stocks (e.g. research into insect proteins such as black army worm) conducted, endorsed and disseminated.	Facilitation
169	Diversify and expand aquaculture to include non-carnivorous commodities and new climate-smart technologies such as aquaponics, intensive aquaculture and marine cage culture. Study the growth and lifecycle of native aquaculture species (e.g. fish, crab, freshwater shrimp, etc.)	Programme with business models to diversify and expand aquaculture to include non-carnivorous commodities and new climate-smart technologies such as aquaponics, intensive aquaculture and marine cage culture assessed, developed, tested and promoted.	Facilitation
170	Diversify livelihoods, markets and/or products and approaches to reduce dependence on fisheries and aquaculture e.g. engage in alternative or supplementary economic activities.	Programme with business model to diversify livelihoods, markets and/or products and approaches to reduce dependence on fisheries and aquaculture e.g. engage in alternative or supplementary economic activities assessed, developed, tested and promoted.	Facilitation

STRATEGIC OBJECTIVE 3. TO PROMOTE ALTERNATIVE LIVELIHOODS CREATION AND DEVELOPMENT AND TO STRENGTHEN CLIMATE RESILIENCE IN FISHERY –DEPENDENT BUSINESSES

	Adaptation measures	Indicative outputs	Alignment with the CCAP
171	Provide support for capitalising on new business opportunities that arise in response to climate change	Programme to support fisherfolk to capitalise on new business opportunities that arise in response to climate change assessed, developed and promoted.	Finance and implementation
172	Enhance research and investments into creating new and alternative fisheries for underutilised wild-caught species and associated strategies for market penetration to support marine-based sustainable livelihood opportunities e.g. Diamond back squid fishery.	Research on, and investments into, creating new and alternative fisheries for underutilised wild-caught species and associated strategies for market penetration to support marine-based sustainable livelihood opportunities e.g. Diamond back squid fishery conducted and promoted.	Facilitation
173	Enhance gear and establish programmes to reduce ghost fishing due to losses during more severe storms (e.g. biodegradable panels)	- Enhanced gear to reduce ghost fishing, due to losses during more severe storms (e.g. biodegradable panels) assessed, developed, tested and promoted. - Programmes to reduce ghost fishing designed and implemented.	Facilitation and implementation
174	Implement projects to convert biological waste (e.g. marine and aquaculture) and nuisances into useful products (e.g. ongoing conversion of the sargassum seaweed to fertiliser)	Projects to convert biological waste (e.g. marine and aquaculture) and nuisances into useful products (e.g. ongoing conversion of the sargassum seaweed to fertiliser) evaluated, developed, tested and scaled up.	Facilitation and implementation

OUTCOME 3: STRENGTHENED PARTNERSHIPS FOR BUILDING SUSTAINABLE AND RESILIENT FISHERIES IN A CHANGING CLIMATE

STRATEGIC OBJECTIVE 1. IMPROVE ACCESS TO FINANCIAL AND BUSINESS SUPPORT FOR LEVERAGING PRIVATE SECTOR INVESTMENT INTO THE FISHERIES SECTOR

	Adaptation measures	Indicative outputs	Alignment with the CCAP
175	Develop sustainable financial mechanisms to support livelihood investments to diversify and adapt e.g. education fund, infrastructure support etc.	Financial mechanisms and schemes to support livelihood investments to diversify and adapt e.g. education fund, infrastructure support etc. evaluated, developed, tested and rolled out	Facilitation and Finance
176	Develop and expand social benefits, insurance (life, medical and livelihood protection insurance schemes), pension and compensation schemes for climate related impacts for fishers and their families	Social benefits, insurance (life, medical and livelihood protection insurance schemes), pension and compensation schemes for climate related impacts for fishers and their families assessed, developed, tested, improved and rolled out.	Facilitation and Finance
177	Enhance the 'ease of doing business' to support business development utilising climate smart food production systems e.g. fiscal incentives and improved access to competitive and affordable financial products and services (loans, favourable interest rate and terms)	The 'ease of doing business' to support business development utilising climate smart food production systems e.g. fiscal incentives and improved access to competitive and affordable financial products and services (loans, favourable interest rate and terms) studied, formulated and promoted	Facilitation and Finance

OUTCOME 4: STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES IN THE FISHERIES SECTOR

STRATEGIC OBJECTIVE 1. STRENGTHEN CLIMATE MONITORING AND COMMUNICATION FOR EMERGENCY PLANNING AND INFORMED DECISION MAKING

	Adaptation measures	Indicative outputs	Alignment with the CCAP
178	Enhance data collection, research (including modelling) and monitoring of fish stocks to make appropriate investment decisions in the fisheries sector (e.g. SMART FADs) (be aware of the risks of overexploitation and potential climate impacts)	Data collection, research (including modelling) and monitoring of fish stocks assessed, tested and improved for making appropriate investment decisions (e.g. SMART FADs), being aware of the risks of overexploitation and potential climate impacts.	Facilitation
179	Develop hazard and risk maps on impacts of climate change for informing fisheries, coastal land and marine use planning	Climate-related hazard and risk maps relevant to fisheries developed and utilised in coastal land and marine planning.	Facilitation
180	Develop emergency plans for the fisheries sector, with Early Warning Systems (EWS) and associated sensitisation to reduce losses and provide timely rehabilitation and disaster response and timely post-disaster recovery support (e.g. speed up vessel repairs, access to new tools and equipment)	- Study conducted to identify mechanisms for improving climate-related and fisheries-relevant information services to help fishers minimise climate risks in their daily activities, including their time at sea. The assessment should cover, among others, existing climatological data collection and information services, EWS, changes in fish stocks, sea weed and invasive species, and an analysis of how improving the services could enable fishers to make informed decisions on where to fish, hazardous areas to avoid and location of SMART FADs, among others. - Digital platform for sharing in a user-friendly way, the crucial information, set-up and operating (e.g. phone app). - Disaster response and rehabilitation plan for the fisheries sector developed.	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
181	Screen, monitor and alert on offshore seaweed movement to decrease the risk of damage to engines, fishing gear and other fisheries infrastructure	System to screen, monitor and alert on offshore seaweed movement to decrease engine and fishing gear damage developed, tested, improved and operational.	Facilitation and implementation
182	Monitor and control existing and emerging invasive species (e.g. lionfish)	System to monitor and control existing and emerging invasive species (e.g. lionfish) developed and operational.	Facilitation and implementation
183	Enhance existing monitoring/alert networks relevant to climate change and fisheries through effective research, training and outreach mechanisms	Existing monitoring/alert networks relevant to climate change and fisheries assessed, enhanced and operational.	Facilitation and implementation

STRATEGIC OBJECTIVE 2. SCALE UP CLIMATE RESILIENT FISHERIES INFRASTRUCTURE TO REDUCE CLIMATE RISKS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
184	Strengthen, retrofit, and/or relocate fisheries and aquaculture infrastructure and assets to better withstand climate impacts	Study conducted to: a) identify fisheries and aquaculture infrastructure that is weak and at high risk of climate impacts; b) suggest solutions to increase the resilience of the identified weak infrastructure, including structural improvements and relocation. Solutions could include the protection of harbour and landing sites; building aquaculture facilities to withstand increased storm damage (e.g. using geo-membrane linings, water recirculating systems and raised banks/dykes in flood-prone pond systems); c) design a plan to increase the resilience of weak but crucial fisheries and aquaculture infrastructure, using the solutions identified in the study.	Facilitation and implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
		- Plan to increase the resilience of weak but crucial fisheries and aquaculture infrastructure implemented.	
185	Deploy hard defences (e.g. sea walls) to protect fisheries livelihoods and infrastructure to reduce climate impacts on local ecosystem services and/or local livelihoods	Needs for hard defences (e.g. sea walls) to protect fisheries livelihoods and infrastructure from climate impacts assessed, infrastructural solutions costed, designed, funded and implemented.	Facilitation and implementation
186	Deploy ecosystem-based solutions (soft defences) to address climate impacts on local livelihoods e.g. wetland rehabilitation	Ecosystem-based solutions (soft defences) to address climate impacts on local livelihoods e.g. wetland rehabilitation studied, developed, tested, installed and operational.	Facilitation and implementation

10. INFRASTRUCTURE AND SPATIAL PLANNING

The 58,891 households of the island are concentrated within 10 km of the sea, along the coast or inland along ridge lines, spurs and plateaus and approximately half of the population lives in and around the low-lying city of Castries.[14] The island's urban centres are located mostly within harbours and bays or associated with a watercourse and the island's vital infrastructure, including its 1,210 km road and bridge networks, airports and sea ports. Medical facilities and tourism developments are also situated in low-lying terrain and directly adjacent, or very near to, coastal areas within, or close to, population near to coastal areas.[9, 14] Telecommunications infrastructure and major power supply networks are generally further inland, but the distribution centres are in populated areas, along the coast.

Currently, Saint Lucia is experiencing rapid urbanisation due to fairly high rates of rural-urban migration, leading to prevalence of squatter settlements near urban centres that continues to escalate in spite of Government's interventions to regulate.[7]

The island's size, location and topography leave critical infrastructure, local housing and livelihoods highly exposed to climate change impacts, that is, those associated with SLR, floods, landslides, stronger storm surges and high winds from more intense hurricanes and beach and shoreline instability (as beaches erode and shorelines retreat).[7, 13]

Many settlements are already at risk of landslides and flooding during extreme weather events. Hurricane Tomas in 2010, caused extensive landslides, severe flooding and damage to housing and critical infrastructure to an estimated cost of > USD 350 million (43.4% of GDP). Ninety-two percent of this cost was due to housing damages, while communities with limited road access were particularly vulnerable, such as Soufriere, which was cut off and isolated.[1, 25 , 26]

Such storm events may also pose the greatest risk to critical infrastructure,[27] as recent hurricanes have been particularly disastrous, causing significant long-term impacts on the island's infrastructure, resulting in tremendous economic setbacks and constituting major recovery costs.

Without adaptation, climate change impacts may, in the long-term, lead to: radical changes in spatial planning; reduced national economic activity; loss of livelihood opportunities; frequent service and transport disruptions; increased pressure on inland forest reserves to provide land for agriculture when coastal land is lost to erosion and inundation; relocation of infrastructure, housing and populations; and shifts in land use. All of this is expected to increase stress on hillside areas to accommodate coastal residents and other activities.[25, 28]

The Government agencies with responsibility for infrastructure and spatial planning are the lead institutions for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

Understandably, there is overlap among the measures listed for infrastructure and other sectors (e.g. water, fisheries, health and education). Further, the measures here are indicative only. They have been previously suggested as relevant and/or necessary for adaptation in this sector/area. It is expected that these will be further elaborated and expanded when a SASAP that encompasses infrastructure and spatial planning is developed.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR CLIMATE ADAPTATION IN INFRASTRUCTURE AND SPATIAL PLANNING

STRATEGIC OBJECTIVE 1. ACCELERATE POLICY, LEGISLATIVE AND REGULATORY PROCESSES INDISPENSABLE FOR ADAPTATION PLANNING AND IMPLEMENTATION

	Adaptation measures)	Indicative outputs	Alignment with the CCAP
187	Accelerate the approval of the revised Land Use Policy	- Land use policy approved, providing risk-based guidance to planning processes, including those related to housing development and critical infrastructure.	Facilitation
188	Draft/Review comprehensive Land Use Plan	- Land use plan drafted/reviewed, including clear zoning of areas not apt for any type of development when in locations highly exposed to direct climate impacts (e.g. most exposed coastal areas) and establishing building setbacks for river bank properties (to reduce vulnerability and facilitate river channel maintenance).	Facilitation
189	Periodically reassess all building codes in light of new climate change issues and advances in building material and technology to ensure climate resilience	- Revising building codes more frequently officially mandated for setting climate resilient standards for public property and new property developments. The building codes should be updated in terms of hurricane resistance, energy efficiency, flood resistance and site improvements, including drainage improvement, among other factors.	Facilitation
190	Develop legislation reforms to link property insurance, construction quality and climate risk level of the property location	- Potential reforms analysed. - Appropriated legislative reforms endorsed.	Facilitation

	Adaptation measures)	Indicative outputs	Alignment with the CCAP
191	Plan and initiate phased relocation of settlements and vital infrastructure to less vulnerable areas	- Feasibility studies for the relocation of the most vulnerable settlements and vital infrastructure conducted. - Long-term relocation plans elaborated, discussed and approved. - Regulatory and enforcement mechanisms for relocation set-up. - Plan implementation initiated.	Facilitation and Implementation
192	Facilitate access to assistance and resources/incentives for the most socio-economically vulnerable groups to retrofit their properties	Create incentives for retrofitting for the poor and other vulnerable groups.	Facilitation
193	Eliminate maladaptive incentives and revise and strengthen enforcement mechanisms to development in hazardous and vulnerable areas	- Maladaptive incentives identified and communicated. - Enforcement mechanisms strengthened. - New development in hazardous areas and vulnerable areas minimised.	Facilitation
194	Build the capacity of the infrastructure and spatial planning sector for integrating climate adaptation into their operations through the development of guidelines and the provision of training on how to integrate climate change considerations into infrastructure planning and operations	Guidelines and the provision of training on how to integrate climate change considerations into infrastructure and spatial planning operations developed and training designed and delivered.	Facilitation

OUTCOME 2. STRENGTHENED INFRASTRUCTURE TO WITHSTAND CLIMATE IMPACTS

STRATEGIC OBJECTIVE 1. RETROFIT EXISTING AND BUILD CLIMATE RESILIENCE OF NEW INFRASTRUCTURE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
195	Create and start the implementation of a Plan for the retrofitting of existing public infrastructure most at risk from climate impacts (e.g. Roads, buildings (schools, health facilities, government buildings, community centres), water infrastructure,)	- Climate change vulnerability and risk assessments conducted for public infrastructure in the various development sectors and geographic regions. The studies should a) assess needed retrofitting interventions, b) provide recommendations on building climate resilience of planned new infrastructure, c) establish feasibility of retrofitting and climate resilience options and, d) propose plans of action for both (including relocation when absolutely necessary). - Plan analysed and endorsed - Financial resources to start the implementation of the plan secured. Some of the actions to be contemplated include: - Reinforcement of existing coastal structures e.g. jetties and landing docks. - Increasing the elevation of future coastal developments. - Upgrading public buildings with RWH and water recycling systems. - Increased septic tank volumes to compensate for flooding.	Facilitation and Implementation
196	Promote the retrofitting and enhanced climate resilience of private property and infrastructure	- Awareness raising campaigns on the benefits of simple private retrofitting solutions designed and implemented. - Programme of technical assistance/advice for the retrofitting/climate-proofing of private property established and prioritising attention to the most vulnerable groups (identified through the national climate vulnerability assessment).	Facilitation

OUTCOME 3. ENHANCED INFRASTRUCTURE-BASED CLIMATE ADAPTATION

STRATEGIC OBJECTIVE 1. PROMOTE INFRASTRUCTURAL UPGRADES FOR CLIMATE ADAPTATION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
197	Encourage developers and homeowners to install RWH systems and/or sufficient water storage for appropriate uses and as a backup during dry periods and water cuts	- Public awareness and capacity building activities conducted to encourage infrastructure strengthening and upgrades, including the installation of RWH systems. - Incentives for RWH in place. - Increased installation of RWH systems and water tanks	Facilitation
198	Encourage developers and homeowners to strengthen and upgrade guttering, drainage and other infrastructure that may be damaged during heavy rain events.		Facilitation

STRATEGIC OBJECTIVE 2. ENHANCE PORT OPERATIONS AND SAFETY UNDER A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
199	Assess and strengthen the resilience and operational thresholds in the coastal infrastructure	- More flexible seaport operations analysed and planned, to take advantage of suitable operating conditions (and in anticipation of increased downtime). - Quay and wharf levels including infrastructure revised.	Facilitation and Implementation

OUTCOME 4. STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES

STRATEGIC OBJECTIVE 1. INCREASE EMERGENCY RESPONSE CAPACITY

	Adaptation measures	Indicative outputs	Alignment with the CCAP
200	Ensure that all buildings designated as emergency shelters are not in vulnerable areas; increase the number of shelters on higher ground either near the coast or inland	- Increased number of shelters in less vulnerable locations	Implementation

STRATEGIC OBJECTIVE 2. INCREASE NATIONAL CAPACITY TO ASSESS AND ADDRESS CLIMATE-RELATED VULNERABILITY AND RISK

	Adaptation measures	Indicative outputs	Alignment with the CCAP
201	Develop/update national emergency plans based on a comprehensive assessment of human settlements and related infrastructure at risk of climate change	- National climate vulnerability assessment and mapping conducted and used to develop/update national emergency plans. - The psycho-social support network for dealing with post-disaster stress is created, integrated in the general emergency strategy and operating.	Facilitation
202	Develop psycho-social support network for dealing with post-disaster stress		Facilitation and Implementation

11. NATURAL RESOURCE MANAGEMENT (TERRESTRIAL, COASTAL AND MARINE)

Saint Lucia possesses an impressive diversity of terrestrial and aquatic biological species and an equally remarkable diversity of ecosystems. The island's two key economic sectors, tourism and agriculture heavily rely on natural ecosystems and the services they provide. Terrestrial and freshwater ecosystems are vital for filtering pollutants and sediment, especially to the agricultural sector, which relies primarily on rain-fed rivers and healthy watersheds. Soil retention and the provision of clean water are critical services provided by forest ecosystems. Saint Lucia's coral reefs, mangroves, and seagrass meadows along the coastline, form a highly interdependent and valuable coastal and marine ecosystem network that protect the shores, while providing marine life habitat and tourism attractions.[16]

Beaches: the numerous beaches around Saint Lucia's coastline are among the most important tourism attractions on the island. The beaches also provide critical habitat for some species, especially marine turtles. A single major hurricane can have a significant impact on beaches and dramatically change the shoreline. Shoreline retreat and reduction increases the vulnerability of coastal infrastructure to erosive wave action. Climate change impacts on beaches also threaten the survival of marine turtles, iguanas and shore birds. Sea turtles, for example, could suffer from damage and loss of nesting sites on the island due to SLR (a 1 to 2 m increase in sea level could damage 6-10% of the nesting sites), and changes in beach profiles brought by intense tropical storms. Higher temperatures may also affect these species by changing sex ratios in developing eggs and thus, reducing their reproductive capacity.[17, 29]

Although **mangroves** build up sediments that can counter the impact of SLR, many mangrove shorelines are retreating inland. In addition, mangroves guard against the impact of hurricanes on coastal lives, livelihoods and assets, but they are not unaffected by the high winds and surges. As the storms are expected to intensify in the future, these ecosystems will become increasingly vulnerable to direct damage.[13] Moreover, higher sea temperatures, also resulting from climate change, will be damaging to coral reefs that mangroves depend on for shelter from wave action and for nutrient exchange. [17]

Coral reefs. About 44% of the Saint Lucia's shoreline is protected by fringing, extremely delicate and sensitive coral reef ecosystems. Corals are sensitive to sea surface temperature increases; 1°C above average seasonal temperature can bleach them. [17] In general, coral cover is on the decline and macro-algal cover is on the rise. In 1998, 45 species of coral were recorded on the west coast; however, recent studies identified only 23 species.[7] In addition, climate change is expected to increase the intensity of rainfall events and tropical storms, triggering increased erosion and sedimentation of near-shore coral reefs and hindering the recovery of damaged reefs.[17],[29] Physical damage to coral systems from these intensified storms will have negative impacts on fish nursery habitats,[13] and can seriously affect the abundance and diversity of reef fish that depend directly on the coral for food, protection, and breeding ground.[13,29] The cost of climate change-induced damage to coral reefs in Saint Lucia could reach between USD 1.7 and 3.4 billion by 2050.[30]

Seagrass beds are common along Saint Lucia's coasts and are composed mainly of indigenous turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*) and to a lesser extent, shoal grass (*Halodule wrightii*) species; which serve as nursery areas for many species of fish. In general, larger and denser sea grass beds are found off the east coast, compared to the infrequent and sparsely covered sea grass patches along the west coast. There is a known invasive species of seagrass (*Halophila stipulacea*) that has colonised Saint Lucia's marine environment. The extent of the invasion of *H. stipulacea* is unknown. However, it has been observed in the north of the island in areas that were not previously inhabited by seagrass.[29]

Forests: Approximately 35% of the island's landmass is under forest cover,[7] with 19,000 acres of rainforest acting as a habitat for rare birds and plants.[31] Forests, in particular, are essential for water and soil conservation,[13] as these ecosystems absorb and buffer the flow of watercourses after heavy rains, providing protection to underlying areas from flooding. Extreme weather events and heavy rainfall, often result in massive landslides from the mountainous slopes of Saint Lucia, as was recently experienced during Hurricane Tomas, in 2010. Damages to the forestry sector, excluding damage to forest roads, river banks and soil structure was estimated at over XCD 56 million (approximately USD 21 million). The already increasing intensity of hurricanes is causing more severe damage, with potentially longer-term consequences for the integrity of the forest structure and canopy. Predicted changes in precipitation patterns and increased average daily temperatures could result in a loss of rainforest zones and an associated increase in the tropical dry forest zones. Higher temperatures and reduced moisture could result in forests becoming much drier, possibly destroying epiphytes, which provide important habitat for birds, insects and reptiles. Potentially, habitats of endangered and endemic species could be lost altogether.[17]

The Government agencies with responsibility for natural resource management (terrestrial, coastal and marine) are the lead institutions for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

Understandably, there is overlap among the measures listed for this area (terrestrial, coastal marine) and other sectors (e.g. water, fisheries). Further, the measures listed are indicative only. They have been previously suggested as relevant and/or necessary for adaptation in this sector/area, but are expected to be expanded and refined during the elaboration of a SASAP.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR ECOSYSTEM-BASED ADAPTATION AND NATURAL RESOURCE MANAGEMENT UNDER A CHANGING CLIMATE

STRATEGIC OBJECTIVE 1. IMPROVE THE NATIONAL LEGAL AND REGULATORY FRAMEWORK TO FACILITATE NATURAL RESOURCE MANAGEMENT AND ECOSYSTEM-BASED ADAPTATION UNDER A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
203	Revise and implement an Integrated Coastal Zone Management Plan	- Integrated coastal zone management plan revised with a well-defined authority and budget and implemented	Facilitation
204	Increase regulation and monitoring of coastal and river bank setbacks for all types of development	- Revised Land Use Policy approved (including coastal setback protection) and enforced	Facilitation
205	Provide incentives to encourage appropriate development or relocation by land owners of environmentally sensitive and/or high climate risk areas	- Potential incentives analysed, consulted on, and approved (e.g. land swap, tax breaks).	Facilitation
206	Legislate to establish a network of protected areas	- Legislation developed and approved.	Facilitation
207	Enact and enforce legislation to prohibit beach and river sand mining and removal of river stone	- Beach sand mining legislation approved and enforced	Facilitation

STRATEGIC OBJECTIVE 2. SET-UP AND ENHANCE EXISTING ENVIRONMENTAL MONITORING SYSTEMS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
208	Establish air quality monitoring systems	- Air quality monitoring systems designed, operating and linked to health warning systems	Facilitation

OUTCOME 2. INCREASED ECOSYSTEM QUALITY AND COVERAGE

STRATEGIC OBJECTIVE 1. INCREASE COVERAGE OF SUSTAINABLY MANAGED AND PROTECTED ECOSYSTEMS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
209	Protect water catchments, riparian zones and natural forests	- Riparian buffer zones introduced and maintained. - River reserves introduced. - Plan for State acquisition of private water catchments and intact natural forests formulated, - Plan implementation initiated.	Implementation
210	Expand reforestation programmes, prioritising the reforestation of critical watersheds	- Reforestation programmes in critical watersheds expanded and new programmes implemented.	Implementation
211	Establish river usage zoning and regulations to reduce water use conflicts and secure the integrity of riverine ecosystems and water quality.	Feasibility study establishing river usage zoning and required regulations/guidelines conducted.	Facilitation
212	Maintain existing vegetative buffers – mangroves, coastal vegetation, river banks - through regulations and enforcement	Wetlands and main vegetative buffers along riverbanks and coasts are protected and restored through regulations and enforcement.	Facilitation
213	Protect wetland ecosystems, most of which are coastal and have been targeted as landfill sites or earmarked for development		Facilitation
214	Enhance fish nursery habitats	- Mangrove and coral reef restoration and artificial reef programmes scaled up.	Implementation
215	Restore degraded coastal ecosystems (including beaches)	- Beach nourishment programmes amended and accelerated. - Buffer zones for coastal habitats to allow for natural regeneration promoted	Facilitation and Implementation
216	Determine and implement appropriate habitat protection and rehabilitation measures for the most rapidly declining	- Assessment of endangered ecosystems conducted. Results presented in report which should also provide evidence-based	Facilitation and Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
	ecosystems, (i.e. for habitats such as inland forest, coral reefs and mangroves);	recommendations on the most appropriate rehabilitation measures. - Feasibility study for island-wide restoration of most vulnerable habitats and ecosystems conducted. - Ongoing restoration activities scaled up and new ones initiated.	

STRATEGIC OBJECTIVE 2. REDUCE THE IMPACT OF ECOSYSTEM DEGRADATION FACTORS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
217	Control the risk of chemical pollution (and other types of pollution) of water sources	- Guidelines elaborated for the handling, transportation and storage of chemicals and chemical waste; managing accidents and spills; and the use and disposal of chemicals. - Red-flagging of pesticides and chemical products at customs implemented.	Facilitation and Implementation
218	Scale-up strategies for the prevention, monitoring and control of invasive species	- Study on improved monitoring and control of invasive species in terrestrial, marine (e.g. lionfish) and coastal ecosystems conducted and communicated. - Plan to improve control of invasive species elaborated (including communications campaign) and implemented.	Facilitation and Implementation
219	Implement measures to reduce ghost fishing resulting from extreme weather	- Gear for reducing ghost fishing introduced and adopted. - Fish pot management plan developed and approved	Implementation

OUTCOME 3. STRENGTHENED ECOSYSTEM BASED ADAPTATION

STRATEGIC OBJECTIVE 1. ENHANCE ECOSYSTEM SERVICES TO REDUCE CLIMATE RISKS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
220	Include green spaces in urban planning to increase vegetation cover and reduce the heat island effect	- Urban planning operations including green spaces are scaled-up. - Urban afforestation programme planned and implemented. - Green roofs tested and introduced.	Implementation
221	Evaluate the costs and benefits of hard infrastructure vs. various natural buffers on reducing exposure to climate impacts island-wide.	- Study conducted. Results analysed and presented in report and recommendations used in land use planning decisions. - Programme for restoring natural buffer ecosystems designed and approved.	Facilitation and Implementation
222	Reduce the risks and impacts of wildfires to forests	- Analysis of most fire-prone areas conducted, and including suggested measures, that are locally appropriate to reduce the risk of fires and control forest burning (e.g. break zones).	Facilitation

12. EDUCATION

Education plays a critical role in transferring and translating scientific knowledge on climate change, hazards and potential impacts to individuals and communities, but also offers them, through formal and non-formal systems, the elements to plan adaptive responses, within their own contexts and possibilities. However, while education can act as a mechanism for igniting climate action, it can also be directly hit by climate hazards. Education discontinuity occurs during and after extreme hydrometeorological events, such as when schools close due to emergencies that may or may not directly affect school facilities (for example hurricanes); or simply when water supply is disrupted due to extended dry periods; or as a result of high levels of siltation in reservoirs after strong rainfall events, all of which may become more common as global warming progresses. At the same time, school facilities often double as emergency shelters, protecting vulnerable groups during climate-related disasters. Effective national adaptation demands high quality formal and non-formal climate change education, based on up-to-date information and reaching all country residents. This requires flexibility and the capacity to update learning materials, periodically train teachers, journalists, social communicators and other groupings that can help disseminate and tailor key messages to the various segments of society. Climate change adaptation in the education sector therefore entails: taking the necessary steps to safeguard education continuity; retrofitting and building the climate resilience of education facilities; continuously updating the knowledge transferred; and ensuring that all members of society receive, in a systematic manner, the information they need to make informed decisions.

The following measures are indicative only. They have been previously suggested as relevant and/or necessary for adaptation in this sector/area. It is expected that they will be refined and expanded when a SASAP for Saint Lucia's education sector is developed, based on a detailed review of adaptation needs and required responses and multiple stakeholder consultations. It is also worth noting that there are public education and sensitisation measures proposed for every sector and area in this NAP.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR CLIMATE ADAPTATION EDUCATION

STRATEGIC OBJECTIVE 1. FACILITATE CLIMATE ADAPTATION LEARNING

	Adaptation measures	Indicative outputs	Alignment with the CCAP
223	Develop and endorse a Climate Change Education, Awareness Raising and Civil Society Participation Strategy for Saint Lucia, in alignment with Article VI of the UNFCCC and to accelerate civil participation in adaptation	- Climate Change Education, Awareness Raising and Civil Society Participation Strategy for Saint Lucia drafted, endorsed and implemented	Facilitation

OUTCOME 2. IMPROVED AND EXPANDED CLIMATE CHANGE EDUCATION AS THE BASIS FOR EFFECTIVE ADAPTATION

STRATEGIC OBJECTIVE 1. FACILITATE CLIMATE CHANGE TEACHING

	Adaptation measures	Indicative outputs	Alignment with the CCAP
224	Evaluate the impact of climate change education programmes on behaviour	- Evaluation of the effectiveness of climate change educational programmes and materials on behaviour for all groups conducted, and gaps and weaknesses identified. - New materials, tailored for specific group needs (e.g. vulnerable groups, young children, elderly, illiterate) proposed and developed and modules on climate risks integrated as part of the Climate Change Education Strategy.	Facilitation and Implementation
225	Tailor and develop climate education materials according to specific group needs		Facilitation and Implementation
226	Integrate into/enhance in, climate education materials, modules on hazards, impacts and risk reduction and management options, e.g. health risks (vector-borne disease, heat, injuries)		Facilitation and Implementation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
227	Conduct training and provision of teachers on climate change science and on adaptation on a national curriculum basis	- Modules on risk management options, integrated, as necessary, into existing teaching material. - Training materials designed as part of the Climate Education Strategy and training delivered to teachers on a regular / curriculum basis.	Facilitation and Implementation

STRATEGIC OBJECTIVE 2. INCREASE PUBLIC AWARENESS ON CLIMATE CHANGE AND ADAPTATION OPTIONS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
228	Design and implement public awareness and education programmes about climate change and its effects and adaptation options	- Awareness raising campaigns designed and implemented as part of the Climate Change Education Strategy and other adaptation and sectoral development initiatives.	Facilitation and Implementation
229	Design and implement public awareness and education programmes on the links between development, environment, society and climate change, prompting for relatable and connected actions (e.g. nature conservation, tree planting, waste management, consequences of burning, etc.)		Facilitation and Implementation

OUTCOME 3. PROFESSIONAL CAPACITIES BUILT FOR LEADING FUTURE CLIMATE ADAPTATION PLANNING IMPLEMENTATION

STRATEGIC OBJECTIVE 1. BUILD IN-COUNTRY SPECIALISED PROFESSIONAL CAPACITIES FOR CLIMATE CHANGE ADAPTATION PLANNING AND IMPLEMENTATION

	Adaptation measures	Indicative outputs	Alignment with the CCAP
230	Identify the specialised professional skills required for national and sectoral adaptation that are lacking or scarce in Saint Lucia	- Evaluation conducted on the number of people in Saint Lucia with the specialised professional capacities required for adaptation in the various development sectors (e.g. hydrology, climatology, marine biology, etc.). to inform the design and tailoring of university level degrees or programmes / scholarships for skill acquisition abroad	Facilitation and Implementation
231	Engage universities and research institutions to offer scientific programmes in areas of high relevance for the NAP (e.g. hydrology, climatology, oceanography etc.) through joint ventures.	- Partnership for building professional capacities for climate change adaptation in Saint Lucia established between national and regional universities, academic institutions and the GoSL. - Programmes to be imparted designed and agreed by all parties. - First programme launched	Facilitation and Implementation
232	Provide scholarships for interested students to register in recognised programmes of foreign universities in the areas where professional skills are lacking or scarce in Saint Lucia and needed for planning and implementing climate change adaptation in and across sectors.	- Scholarships provided for interested students - Students trained in climate change programmes and also in climate change-relevant subjects in other programs	Facilitation and Implementation

OUTCOME 4. STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES

STRATEGIC OBJECTIVE 1. IMPROVE INFRASTRUCTURE FOR EDUCATION CONTINUITY UNDER A CHANGING CLIMATE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
233	Ensure school infrastructure is climate resilient, particularly schools that double as emergency shelters	- Plan for retrofitting and climate proofing education infrastructure elaborated, approved and implementation initiated.	Implementation

13. HEALTH

Having many endemic and environmentally-sensitive disease vectors, as well as human populations burdened from high rates of cardio-respiratory diseases, makes the health sector in Caribbean SIDS particularly vulnerable to climate change impacts.[31]

Amongst a wide range of direct, indirect and cumulative impacts of climate change on public health, it has been anticipated that higher temperatures and changes in rainfall patterns in Saint Lucia, may lead to increased heat waves, floods, storms, fires and droughts. These, in turn, could increase the incidence of injuries, vector, water and food-borne diseases, such as *schistosomiasis* and cholera, dengue, *Leptospirosis* and yellow fever. Malnutrition, respiratory diseases and cardio-respiratory diseases could also see higher incidence rates.[7,13,32] Additionally, climate change could also directly affect exposed health system infrastructure.

In 2011, the Economic Commission for Latin America and the Caribbean (ECLAC) estimated the economic impact of climate change on the health sector in Saint Lucia. The ECLAC study paid special focus to the costs of gastroenteritis, schistosomiasis, ciguatera poisoning, meningitis, cardiovascular diseases, respiratory diseases and malnutrition with climate change scenarios in the country. The results of the study indicate that without adaptation measures in place for supporting health care, the cost of increased morbidity and mortality due to climate change in the island nation, could reach USD 182.4 million per year by 2050.[30]

The Government agency with responsibility for health is the lead institution for the implementation of the measures outlined below, recognising that effective implementation would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted. It is expected that for measures that are to be implemented, a feasibility study and needs assessment will be incorporated into the design of the project or programme, as necessary.

The following measures are indicative only. They have been previously suggested as relevant and/or necessary for adaptation in this sector/area It is expected that they will be refined and expanded when a SASAP for Saint Lucia's health sector is developed, based on a detailed review of adaptation needs and required responses and multiple stakeholder consultations.

OUTCOME 1. ENHANCED ENABLING ENVIRONMENT FOR HEALTH-RELATED CLIMATE ADAPTATION ACTION

STRATEGIC OBJECTIVE 1. IMPROVE THE NATIONAL LEGAL AND REGULATORY FRAMEWORK TO FACILITATE ADAPTATION IN THE HEALTH SECTOR

	Adaptation measures	Indicative outputs	Alignment with the CCAP
234	Inclusion of climate change-related health considerations in EIAs	- Climate change related-health considerations integrated in EIAs.	Facilitation
235	Develop and enforce air quality standards (including indoor air quality standards)	- Air quality standards developed and enforcement mechanisms set-up and operating.	Facilitation
236	Enact legislation for the protection of vulnerable groups, including the young and elderly	- All elements to be considered in the legislation analysed. - Legislation enacted and enforced.	Facilitation

STRATEGIC OBJECTIVE 2. GENERATE CLIMATE, ENVIRONMENTAL AND SOCIOECONOMIC DATA AND SCIENCE-BASED INFORMATION CRITICAL TO ADAPTATION IN THE HEALTH SECTOR

	Adaptation measures	Indicative outputs	Alignment with the CCAP
237	Map and model high resolution climate-related hazard maps (including landslide, flood and fire hazard maps) and the risk of disease with climate change scenarios to support long-term planning	- Hazard assessments conducted information analysed in reports and communicated. - High resolution flood risk maps produced. - High resolution major climate-associated disease maps produced. - High resolution fire risk maps produced. - High resolution landslide risk maps produced. - Study conducted for modelling and mapping the risk of disease under various climate change scenarios, based on improved data, up-to-date climate projections and epidemiological information; results of the study analysed, presented in a report and communicated. - Disease risk maps with climate change scenarios elaborated.	Facilitation

	Adaptation measures	Indicative outputs	Alignment with the CCAP
238	Improve data collection and analysis for modelling and mapping disease occurrence	- Analysis of current data collection systems for disease conducted, with recommendations on how the different sectors can contribute to decrease risks (e.g. modifications in land-use, land-planning, construction, water storage, etc.) and on how to improve disease outbreak surveillance systems. - Improved data collection and surveillance systems for disease outbreaks set-up - Public health data systems incorporate the monitoring of vector and waterborne diseases.	Facilitation
239	Standardise information collected after disasters to more accurately measure morbidity and mortality.	- Study to set-up an effective information standardisation system conducted. - Standardisation procedures and system in place and operating.	Facilitation
240	Establish systems for monitoring ultraviolet (UV) and air pollutants of concern	- UV and air pollutant monitoring equipment and systems established and operating	Implementation
241	Analyse existing primary basic core and secondary health care data, including morbidity data, hospital admissions, and emergency attendance.	- Systems for the capture and rapid exchange of health surveillance data established and operating. - Systems for the analysis of basic health care data established and operating. - Training on health care data analysis delivered. - Health care information continuously updated.	Facilitation
242	Establish more effective and rapid electronic exchange of surveillance data across sectors.		

OUTCOME 2. IMPROVED PUBLIC HEALTH UNDER A CHANGING CLIMATE

STRATEGIC OBJECTIVE 1. REDUCE THE RISK OF CLIMATE-SENSITVE VECTOR-BORNE DISEASE OUTBREAKS AND IMPROVE OUTBREAK MANAGEMENT

	Adaptation measures	Indicative outputs	Alignment with the CCAP
243	Assess effectiveness of current vector control measures and management systems and address limitations.	- Assessment study conducted on the effectiveness of current vector control measures and management systems. The study should highlight gaps and weaknesses in surveillance and response systems, including regulatory limitations and provide a set of recommendations and a plan for improvement, inclusive of a programme for cross-sectoral participation in vector control and monitoring. - Plan to address effectiveness issues identified in the assessment, elaborated, submitted for funding and initiated. - Cross-sectoral programme on vector control designed and funded, including institutional capacity building and public awareness activities. - Measures to increase effectiveness taken, including the elaboration of guidelines/regulations for mosquito breeding in constructed water bodies. - Awareness raising campaigns on vector-borne diseases designed and implemented. - All relevant sectors engaged in vector control.	Facilitation and Implementation
244	Establish and enforce regulations/guidelines for control of mosquito breeding in constructed water body habitats (e.g. domestic containers rainwater tanks, sewage ponds)		Facilitation
245	Establish a cross-sectoral programme on vector control, with the engagement of the health, planning, agricultural, forestry and environment sectors		Implementation
246	Build human capacities for the surveillance of vector density and disease transmission		Facilitation
247	Raise awareness on climate change diseases, the risks associated with living or recreating near vector breeding habitats.		Implementation

STRATEGIC OBJECTIVE 2. REDUCE HEALTH RISKS DURING HEAT WAVES

	Adaptation measures	Indicative outputs	Alignment with the CCAP
248	Set-up a heat event response plan	Heat event response plan set up and including: a) provisions for increased hospital and nursing home staffing during heat events, b) extreme heat alerts, c) awareness raising campaigns on heat avoidance procedures and management of health impacts, d) recommendations to government and private sector to modify work schedules to avoid exposure to maximum heat, e) guidelines for school attendance and public events (e.g. sporting events)	Facilitation
249	Plan to allow an increase in hospital and nursing home staff during heat- events		Facilitation
250	Implementation of education campaigns on heat reduction/avoidance procedures and management of health impacts.		Facilitation

STRATEGIC OBJECTIVE 3. IMPROVE HEALTH SURVEILLANCE SYSTEMS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
251	Monitor hazard management measures to reduce health risks (e.g. fire breaks, fuel loads, flood management, trees near power lines, etc.)	- Assessment of existing management systems for the hazards most relevant to health conducted, limitations identified and a mechanism for monitoring hazard management systems identified. - Monitoring system of hazard management systems set-up and operating.	Facilitation
252	Improve epidemic forecasting for climate sensitive diseases	- Assessment of epidemic forecasting systems applicable in Saint Lucia conducted. - Recommendations of the assessment included in projects and implemented.	Facilitation and Implementation

253	Improve active laboratory-based disease surveillance and prevention systems.	- Evaluation of the effectiveness of current laboratory-based disease surveillance and prevention systems conducted. - Recommendations from the evaluation included in programmes and, if necessary, in projects to be submitted - Measures to improve laboratory-based disease surveillance and prevention systems implemented	Facilitation and Implementation
254	Establish new or improve existing monitoring of: - Seasonal patterns of respiratory disease. - Veterinary disease - UV radiation	- Monitoring systems developed or improved and operating and linked to warning systems.	Facilitation and Implementation

STRATEGIC OBJECTIVE 4. IMPROVE HEALTH CARE AND INFORMATION FOR VULNERABLE GROUPS

	Adaptation measures	Indicative outputs	Alignment with the CCAP
255	Strengthening climate-sensitive vector-borne disease public health infrastructure to ensure access to treatment in vulnerable communities.	- Plan established to improve health care for vulnerable groups. The plan identifies vulnerable groups based on up-to-date poverty and other socioeconomic factors, but also considering their exposure to climate risks. The plan outlines mechanisms for ensuring, easing and increasing access to health care and health-related information by vulnerable groups and for strengthening health infrastructure in vulnerable communities - Plan approved, and implementation initiated	Facilitation and implementation
256	Regional assessments of water-related health issues and identification of vulnerable communities		
257	Conduct awareness raising campaigns on hygiene, and water- disease after extreme events to vulnerable communities	- Awareness raising campaigns developed and delivered on a cyclical basis	Implementation

OUTCOME 3. STRENGTHENED PREPAREDNESS TO CLIMATE VARIABILITY AND EXTREMES

STRATEGIC OBJECTIVE 1. STRENGTHENED HEALTH SYSTEM EMERGENCY PLANNING AND RESPONSE

	Adaptation measures	Indicative outputs	Alignment with the CCAP
258	Evaluate health system response to, and health outcomes of, extreme weather events to improve emergency preparedness, response and recovery plans	- Study evaluating health system response to, and health outcomes of, extreme weather events conducted, identifying key limitations (including data gaps) and providing concrete recommendations and measures to improve emergency preparedness and recovery plans and systems.	Facilitation
259	Improve contingency planning for allowing access of emergency personnel and equipment to isolated regions.	- Measures to facilitate the access of emergency personnel and equipment to isolated regions and to reach vulnerable groups identified and integrated in contingency planning	Facilitation

14. TOURISM

Major tourism developments, most of the critical infrastructure and environmental attractions they depend upon, as well as the majority of Saint Lucia's population are concentrated along the coast, exposed to rising sea levels, coastal erosion, winds, high energy waves and storm surges.[30,31] In November 1999, surge damage in Saint Lucia associated with Hurricane Lenny was in excess of USD 6 million, even though the storm was centred many kilometres offshore.[17]

Storm surges, together with a rising sea level, amplify coastal erosion. It has been estimated that a 1m rise in sea level would place 7% of the Saint Lucia's major tourism properties at risk, along with one of the country's two airports and 100% of the sea ports. Coastal erosion is expected to negatively affect the sector earlier than flooding / submersion with SLR. With projected 100 m erosion, 30% all the resorts in Saint Lucia would be at risk, affecting property values, insurance costs, destination competitiveness, marketing, and the wider local employment. It has been estimated, that the cost of rebuilding for tourist resorts damaged by SLR could exceed USD 134 million in 2050 and reach up to USD 315 million in 2080.[17]

Coastal erosion, together with SLR, also threaten sea turtle nesting sites, a tourist natural attraction, with 30% affected by a 50 m erosion scenario and 50% at risk with 100 m beach erosion.[17] The loss of near-shore tourism resources and potential for reduced appeal of the environment-based tourism attractions (e.g. deteriorated corals or ocean views obstructed by infrastructure to stop coastal erosion), can reduce the attractiveness of Saint Lucia as a destination to potential tourists.[17] The total estimated cost of climate change to tourism in Saint Lucia, including reduced visits, land losses to SLR and damages to coral reefs has been calculated at between USD 7.9 billion and USD 12.1 billion by 2050. This is equivalent to a cost of 3.6 to 12 times the island's 2009 GDP.[30]

The dependence on tourism, which is a sector that places great demands on energy, water and environmental resources, coupled with the heavy concentration of tourism infrastructure near or on the shore, makes the sector, and by extension, the national economy, vulnerable to climate change.[27]

In 2015, a National Adaptation Strategy and Action Plan (NASAP) for the Tourism Sector[13] was developed by the GoSL in collaboration with the 5Cs. Some of the measures presented in this NASAP, which have not yet been implemented,* are included in this dedicated section of the NAP to ensure coordination and coherence with the other 7 sectors. Only tourism-specific measures were extracted from the NASAP and represented here in this NAP. The NASAP recognises that measures are meant to either directly enhance the tourism product or support sectors on which tourism depends for its viability. The NASAP recommends that monitoring and evaluation be done on an annual basis, led by the Ministry with responsibility for Tourism, in conjunction with all lead and partner agencies referred to in the NASAP.

* Or only partially implemented.

OUTCOME 1. VIABLE AND PRODUCTIVE TOURISM SECTOR THROUGH DIRECT INTERVENTIONS AND COLLABORATIONS AND SYNERGIES WITH ALL OTHER SECTORS*

	Adaptation measures	Indicative outputs	Alignment with the CCAP
260	Improve recommended guidelines to tourism operators to more effectively address climate change	Guidelines for tourism operators improved and including recommendations on how to more effectively address climate change	Facilitation
261	Use more energy efficient cooling systems as well as proper maintenance	- Cost benefit analysis of the cost of inefficient air conditioning systems performed and results used to inform an awareness raising campaign for the tourism sector - Awareness raising campaigns for the tourism sector to use more efficient cooling systems designed and implemented	Facilitation
262	Develop public awareness programmes for tourists; develop pilot projects to encourage participation of tourists (in reducing carbon emissions while supporting climate change adaptation)	Easy or creative ways for tourists to "offset" their vacation carbon emissions developed and established (e.g. by donating money to fund local reforestation or renewable energy initiatives or by spending a few hours engaged in reforestation work locally etc.)	Implementation
263	Put in place new attractions and implement alternative tours (to adapt to changing environmental conditions) and develop alternative underwater attractions to reduce the stress on reef systems.	New attractions identified and tested.	Implementation
264	Develop a programme that will determine the impacts of coastal hotel development along the coastline in Saint Lucia	Programme developed and implemented	Facilitation

* Note that the overarching outcome presented here is representative of the following three sub outcomes in the NASAP:
1. Improved policy, legal, regulatory and institutional framework for the tourism sector;
2. Improved technical and institutional capacity for the tourism sector;
3. Enhanced and improved training and awareness in relation to climate change and the tourism sector.

	Adaptation measures	Indicative outputs	Alignment with the CCAP
265	Monitor and collect data to reduce lionfish populations and use the data to guide decision-making	Program to monitor lionfish populations developed and implemented	Facilitation
266	Sensitise boat and yacht users about anchorage locations and use the buoy system (to reduce damage and stress on reefs)	Sensitisation campaign designed and implemented	Facilitation
267	Install mooring buoys to provide alternative anchoring systems and protect the reef	Mooring buoys installed	Implementation
268	Utilise existing data to conduct a sea level rise model and use in decision-making	SLR model developed for Saint Lucia	Facilitation
269	Identify the significantly utilise tourism attractions (e.g. Soufriere, beaches) and execute a project to determine the carrying capacity for three priority areas.	Project to identify the carrying capacity of three tourism key attractions areas conducted	Facilitation
270	Establish a learning relationship with Guadeloupe to facilitate knowledge transfer for new technology to use Sargassum as an alternative energy source (biofuel). The possibility of this should be explored prioritising tourism entities located on such beaches as priority for use of biofuel.	Study visits conducted, and technology transfer agreements implemented for transforming Sargassum into biofuel.	Facilitation
271	Develop a public awareness programme for tourism sector stakeholders regarding climate change issues and threats.	Public awareness programme about climate change issues and threats to the tourism sector developed and implemented.	

15. LIMITS TO ADAPTATION

While adaptation is key to reducing risks and impacts of climate change, there are limits to the protection that adaptation can provide. Also referred to as thresholds, tipping points or regime shifts, the term 'limits to adaptation' recognises that adaptation cannot prevent all climate change impacts from occurring. The Intergovernmental Panel on Climate Change (IPCC) defines an adaptation limit as "the point at which an actor's objectives or system's needs cannot be secured from intolerable risks through adaptive actions".[33] In other words, a limit is reached when despite best efforts, adaptation is unable to provide protection from climate change and impacts are then experienced. The IPCC also differentiates between hard and soft adaptation limits. Hard limits are those where there are no foreseeable adaptation options that are able to prevent impacts, while soft limits are those where adaptation options could become available in the future, due to increased availability of resources, improved technology or other changes that would increase the adaptation efficacy.

Ineffective mitigation at the global level drives impacts at regional and national scales and contributes to adaptation limits. However, limits to adaptation can also be influenced by socio-economic, environmental and institutional contexts.[34] Limited financial resources, ineffective institutional structures, sensitive environmental contexts and issues of cultural acceptance and social readiness to enact change are all characteristics that can increase the pace at which the thresholds to effective adaptation are surpassed. An indicative listing of categories and potential adaptation limits for Saint Lucia are further detailed in **Table 11.**

Table 11. Potential adaptation limits

Category of Adaptation Limit	Description	Potential Adaptation Limits for Saint Lucia
Biophysical	Natural limits to ecosystem and organism adaptation; geographical and geological limitations	- Inability of coastal ecosystems, particularly coral reefs and mangroves, to adapt to increased rates and extent of sea level rise, sea surface temperature warming and ocean acidification - Inability of coastal sediment budgets to recover from repeat extreme events, leading to beach erosion - Thermal limits to production of key agricultural crops and tree species and to the survival of endemic animal and plant species - Inability to adapt to multi-meter sea level rise associated with ice sheet melting - Inability of ecosystems and organisms to recover from frequent, high intensity tropical storms
Economic	Limited funds prevent the implementation	- Insufficient financial resources to implement required adaptation measures - Lack of resources to scale up adaptation efforts

Category of Adaptation Limit	Description	Potential Adaptation Limits for Saint Lucia
	of required adaptation strategies	- Unaffordable and unavailable insurance as impacts from climate change increase - Inability to effectively adapt livelihoods to changing conditions (e.g. changing types of fish sourced for income or transitioning from fisheries to other livelihoods) - Limited financial resources of the small private sector community and small to medium business enterprises with limited incentive and opportunity for meaningful and sustained effort
Technological	Technology required for effective adaptation is either unavailable or prohibitively expensive	- Lack of effective or affordable technology to provide coastal protection from impending sea level rise and extreme weather events - Lack of technology to prevent widespread degradation of coral reefs from sea level rise and ocean acidification - Lack of data to identify and implement most effective adaptation technologies
Institutional	Inadequacies in legislation, policies, government and civil society organisations can constrain adaptation efforts	- Inefficient coordination and implementation of identified adaptation measures - Continued usage of particular adaptation measures despite effectiveness - Limited jurisdiction of national institutions to enforce adaptation measures - Limited human resources to devote to adaptation planning, implementation, monitoring and evaluation - Limited and sporadic engagement of the private sector in processes of change
Social/cultural	Values, knowledge, risk perceptions and cultural norms influence choice and implementation of adaptation measures	- Un-sustained public awareness and sensitisation efforts resulting in limited implementation of adaptation measures at the community, enterprise, household and individual levels - Delays in social/cultural acceptance of particular adaptation measures or mitigation measures with adaptation co-benefits (e.g. levees, wind farms, geothermal energy)

Category of Adaptation Limit	Description	Potential Adaptation Limits for Saint Lucia
		- Contradictory adaptation values at different spatial scales (e.g. individual needs of a private property owner vs. national or sectoral needs)

15.1 LOSS AND DAMAGE

Loss and damage generally refers to the impacts of climate change that are experienced despite best efforts at mitigation and adaptation. While limits to adaptation are points when adaptation ceases to be effective, loss and damage refers to actual impacts that are experienced after limits have been reached, coupled with the inadequacy of mitigation efforts. Although there is no universally accepted definition of loss and damage, it is generally acknowledged that damage refers to impacts that can be repaired while loss can be understood as irreversible and permanent effects of climate change.[35]

Loss and damage can be further categorised as either economic or non-economic. Economic loss and damage is a result of the impairment to goods and services that are traded in markets and can thus be quantified and priced. Non-economic loss and damage results from the impairment to those things that are generally not traded in markets and are thus difficult to quantify or price.[36] Examples of non-economic losses include impacts on life, health, mobility, territory, biodiversity, ecosystem services, indigenous knowledge, cultural heritage, sense of place and social cohesion.[37] Both types of loss and damage can be caused by slow onset or extreme weather events and can be either attributed directly or indirectly to climate change. For instance, sea level rise that results in the loss of mangroves, the degradation of fish habitats and the eventual decline in commercially important fisheries could be considered an example of an economic loss indirectly caused by climate change. However, loss of life as a result of a high-intensity hurricane could be considered a non-economic loss directly attributable to climate change.

Attributing loss and damage to climate change must consider the cause of impacts. Existing attribution methodologies generally require the use of high-quality data collected over long periods of time that include information on any socio-economic and demographic changes. Given these specific data requirements, providing evidence to attribute impacts to climate change is difficult. Small islands lack access to reliable, long-term data and in addition, there are a limited number of studies available on climate change impacts.[38] Many small islands use less data intensive methodologies to attribute current and expected loss and damage to climate change. Most commonly used is simple physical reasoning where specific impacts are related to the known effects of climate change on the drivers of hazards. For example, the global average increase in temperature since pre-industrial times is known to have increased sea levels and sea-surface temperatures and also resulted in variations to precipitation patterns- all changes that result in increased intensity of hurricanes and a resultant increase in damages.[39] Thus, impacts associated with high-intensity hurricanes may be classified as loss and damage using simple physical reasoning.

Analysis has shown that since pre-industrial times, the Caribbean has already experienced approximately 1^{o}C of warming.[40] This increase in temperature has had measurable impacts including

(i) warming of both air and ocean temperatures; (ii) increase in the number of very hot days and nights; (iii) longer and more frequent periods of drought; (iv) increase in very heavy rainfall events; (v) higher sea levels; and, (vi) more intense hurricanes with stronger winds and more rain. As global average temperatures increase, the region is expected to grow significantly warmer, experience longer dry periods and more instances of drought, increased intensity of rain events, and more intense tropical storms. Generally harsher climatic conditions may result in loss and damage for Saint Lucia. An indicative listing is summarised in **Table 12.**

Table 12. Potential loss and damage

Sector	Potential loss and damage for Saint Lucia
Water Resources and Services	- Reduced water availability - Increased pollution of freshwater resources through salinisation - More frequent flooding and water shortages - Damage to water infrastructure
Agriculture and Fisheries	- Decreased food availability and security - Reduction in exports of traditional agricultural products - Loss of farmers' income and weakened farming livelihoods - Increase in rural unemployment - Increase in rural to urban migration - Loss of agricultural lands - Decreased agricultural productivity as a result of salt water intrusion - Decline in commercially important fisheries stocks - Loss of fisheries income and weakened fisheries livelihoods - Disruption in fisheries and agriculture services from damaged health infrastructure
Health	- Decline in human and animal health, with potential for increased loss of life - Increased costs of providing public health care - Decreased productivity of people working in non-climate-controlled environments - Increase in waterborne and vector borne disease outbreaks - Increased risk of deaths and injuries associated with extreme events - Disruption in health services from damaged health infrastructure
Infrastructure and spatial planning	- Loss of income and livelihoods from loss and damage related to commercial property and critical coastal and inland infrastructure - Loss of income due to interruptions in the provision of services (e.g. telecommunications, transportation, energy, water and sanitation)

Sector	Potential loss and damage for Saint Lucia
	- Damage and loss to critical infrastructure - Increased infrastructure maintenance costs - Increased costs of insurance and/or loss of insurance in high-risk locations - Loss of investment in coastal areas - Reduction in value of coastal land - Loss of coastal land - Loss of culturally and spiritually important landscapes - Potential migration and displacement of coastal communities - Loss of routine access as a result of land slippages and other impacts from extreme events
Terrestrial, Coastal and Marine Natural Resources	- Degradation of health and biodiversity of freshwater and marine ecosystems, including coral reefs, mangroves, seagrass beds and beaches - Loss of keystone (indicator) species - Loss of ecosystem goods and services - Loss of land productivity and nutrient cycling - Loss of biodiversity and associated livelihoods (e.g. fishing, honey production, eco-tourism)
Education	- Loss and damage to educational infrastructure, resulting in reduced schools and hurricane shelters - Reduction in educational continuity/progression
Tourism	- Damage to important ecosystems such as coral reefs and beaches that contribute to tourism - Loss of tourism revenue due to decreased climatic attractiveness and the effects of more frequent intense storms on travel - Decline in tourism due to mitigation policies such as carbon taxes and increased costs of long-haul air transportation - Loss of services from other contributing sectors (fisheries, forests, agriculture, water) - Damage to tourism infrastructure and interruption to services

15.2 MINIMISING, AVERTING AND ADDRESSING LOSS AND DAMAGE

Within the UNFCCC, loss and damage has emerged as a focus area as it has become increasingly apparent that collective mitigation efforts are inadequate and adaptive capacities are insufficient to prevent all climate change impacts from occurring.[41] This focus on loss and damage is slowly being integrated into the IPCC process as well.[42] Small islands have been active proponents of including loss and damage in the UNFCCC since 1991.[43] Saint Lucia, in particular, has actively engaged in discussions and negotiations on loss and damage.[44,45] After strong and sustained advocacy, the Warsaw

International Mechanism (WIM) for Loss and Damage associated with Climate Change was established in 2013 and is the main vehicle under the Convention to address loss and damage. The WIM is driven by its three functions: (i) enhancing knowledge and understanding of comprehensive risk management approaches to address loss and damage associated with the adverse effects of climate change; (ii) strengthening dialogue, coordination, coherence and synergies among relevant stakeholders; and, (iii) enhancing action and support, including finance, technology and capacity building, to address loss and damage associated with the adverse effects of climate change, so as to enable countries to undertake actions.

The WIM´s Executive Committee (ExCom) is tasked with guiding the implementation of the WIM´s three functions. Its current five-year rolling workplan is structured across five workstreams: (i) slow onset events; (ii) non-economic losses; (iii) comprehensive risk management approaches (iv) human mobility, and (v) action and support. The ExCom has also set up a Task Force on Displacement, which supports implementation of the workplan and has initiated the Fiji Clearing House on Risk Transfer as an interactive online learning platform.

Addressing loss and damage requires comprehensive climate risk management, which is aimed at strengthening the resilience of vulnerable people, communities and nations, including mechanisms for coping with impacts that cannot be avoided. Comprehensive climate risk management is featured in the Paris Agreement as an area for cooperation and facilitation and has also been identified by the WIM ExCom as an effective way of building long-term resilience to climate change impacts by better anticipating situations where irreversible damage results in permanent loss. **Table 13** highlights potential actions for Saint Lucia to address loss and damage within the framework provided by comprehensive climate risk management.

Table 13. Potential comprehensive climate risk management actions

Comprehensive Climate Risk Management Component	Description[46]	Potential Actions for Saint Lucia	Potential Challenges
Risk Assessment	Set of methods that assist in identifying the nature and extent of risk by analysing potential hazards relevant to climate change, exposure and vulnerability	- Mapping of potential hazards relevant to climate change - Vulnerability and impact assessments for key sectors - Improving the creation and use of open sources of data - Promoting cross-disciplinary and cross-sectoral collaboration - Effective risk communication	- Lack of quantitative, baseline and long-term data relevant to conducting climate risk assessments - Limited availability of skilled personnel to conduct assessments - Lack of institutional frameworks among key stakeholders to facilitate holistic risk

Comprehensive Climate Risk Management Component	Description[46]	Potential Actions for Saint Lucia	Potential Challenges
		- High-level political support for development of risk assessments - Mobilisation of stakeholders, including private sector and communities in assessing risk - Utilisation of disaster risk assessment tools to better understand, model and assess risks to potential hazards relevant to climate change	assessment across key sectors
Risk Reduction	Implementation of strategies to reduce risk, including: (i) structural measures (physical construction to reduce or avoid impacts); (ii) non-structural measures (use of knowledge, practice or agreements to reduce risks and impacts); (iii) legislative measures (ordinances or regulations intended to control structures necessary to ensure human safety); (iv) planning (guides	Implementing adaptation measures identified in NAP including, but not limited to: - development and enforcement of key legislation to reduce risks across sectors - integrating adaptation in national development and sector plans - quantifying risk and including projected costs in budgetary processes, as appropriate - incorporating risk information in decision making processes - developing and operationalising early warning systems that deliver timely and accurate predictions of climate change related hazards and trigger effective response actions	- Lack of national early warning systems for identification of local hazards related to climate change, such as drought - Limited generation and application of information on climate risks in decision-making processes - Fragmented institutional frameworks that prohibit holistic approaches to decision-making

Comprehensive Climate Risk Management Component	Description[46]	Potential Actions for Saint Lucia	Potential Challenges
	for successful implementation of risk reduction measures); or (v) early warning systems (generation and dissemination of timely and meaningful warning information on hazards)	**Note:** Saint Lucia does not view migration as an acceptable adaptation strategy, and this is not included in its NAP. However, in the realm of limits to adaptation and loss and damage, Saint Lucia may wish to give consideration to collaboration with countries and organisations on proactive and context specific measures to avert, minimise and address displacement and planned migration of vulnerable communities.[47] This includes: (i) developing and implementing policies that reduce the need for human mobility and/or effectively manage mobility to promote empowered migration; (ii) providing support and protection for internally displaced persons, persons displaced across borders and host communities; and (iii) providing support for the preservation or re-establishment of non-economic values that may be impaired during human mobility.[48,49]	
Risk Transfer	Process of shifting the financial consequences of	- Continued membership in the Caribbean Catastrophe Risk Insurance Facility	- Increased cost and possible discontinuance

Comprehensive Climate Risk Management Component	Description[46]	Potential Actions for Saint Lucia	Potential Challenges
	risks from one party to another through insurance, reinsurance, micro-insurance, sovereign risk financing, risk pooling or risk-linked securities (e.g. climate, resilience or green bonds, regional risk pooling schemes)	(CCRIF SPC), which provides parametric insurance to countries in the region - Continued engagement in livelihood protection policies that assist vulnerable, low-income individuals to recover from damages associated with extreme weather events - Development of local micro-insurance schemes (e.g. agricultural/crop insurance to provide insurance protection for farmers against losses associated with climate change) - Participation in emerging catastrophe bond insurance platforms that pool risks and improve planning responses to catastrophic events (e.g. World Bank MultiCat Programme)	of insurance as climate impacts intensify
Risk Retention	Accepting risk and choosing to absorb the impacts of hazards related to climate change if they occur through methods such as contingency financing, planning and credit, which acknowledge the threat of impacts and increase	- Where practical, accepting the risk of high-frequency and low-severity risks where costs of risk transfer and reduction would outweigh risk retention costs (e.g. flooding associated with high intensity precipitation) - Establishing contingency funds with flexible and rapid dispersal systems	- Increased costs of damages as risk of impacts increases - Limited funds available for contingency fund purposes - Reliance on international donor aid to respond to impacts

Comprehensive Climate Risk Management Component	Description[46]	Potential Actions for Saint Lucia	Potential Challenges
	capacity to recover rather than trying to reduce or transfer risks.	- Improving systems to facilitate remittances - Developing and strengthening savings and loan associations to assist financially vulnerable groups to safely store money or access loans	

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ANNEX 1. RECOMMENDATIONS OF THE STOCKTAKING REPORT FOR SAINT LUCIA TO OVERCOME LIMITATIONS RELATED TO THE NAP PROCESS

Improving the knowledge base for climate change adaptation in Saint Lucia. This can be done by developing local climate extreme indices; yield projections under a wider range of climate scenarios and for a wider range of crops; modelling and mapping coastal flooding and erosion under SLR; modelling and mapping disease outbreaks; assessing climate change impacts on watersheds and river flows and improving wind hazard information. Beyond future climate data and information on sectoral climate change impacts, it is fundamental to generate information on the country's current socioeconomic conditions and natural resources. Updated water, forest and marine resource assessments are needed; digital high-resolution landslide and flood risk and erosion maps, updated land use maps and an updated poverty assessment would allow for the identification and mapping of vulnerable groups. These two last items are urgent for planning targeted adaptation measures.
Improving access to climate, socioeconomic and environmental data. Creating a portal to centralise the necessary climate, environmental and socioeconomic data, as well as mapping resources and reports relevant to the NAP process would facilitate access to the existing information, which is currently scattered. Effort is required in compiling this information and data in a coherent and organised manner, including the new information generated during the NAP process and other adaptation initiatives. The portal could offer interfaces for dissemination of climate change-related information that is useful to various audiences.

Investing in climate change communication and awareness raising efforts is necessary to expand the coverage of previous and ongoing initiatives and to improve the basic understanding of climate change challenges and adaptation options at all levels of society. These efforts would be more effective if they receive guidance from science and social communicators and are integrated as short and long-term NAP activities.

*Building in-country climate change information generation capacity***.** This is a long-term objective for the NAP that involves the engagement of universities and research institutions for the development and strengthening of academic scientific programmes in areas of high relevance for the NAP (e.g. hydrology, climatology, marine biology, etc.). In the short-term, capacity could be built through the provision of scholarships for interested students to register in recognised programmes in these areas in foreign universities.

Alignment of the NAP Process with medium and long-term development planning. Various policies that are currently under formulation or revision could be used as opportunities (entry points) for the NAP to mainstream climate change adaptation at the national level and into some sectors in the short and medium-term. The mechanism to incorporate national and sectoral NAP priorities into these policies is still to be defined. Designing general guidelines for mainstreaming adaptation into sectoral policies and planning processes could help in this effort.

Ensuring an enabling policy environment. Accelerating the formal approval of draft policies and regulations that are directly relevant to the NAP would facilitate the formulation of sectoral NAPs and the prioritisation of NAP activities. This could also help to integrate adaptation considerations into the relevant sectoral budgets.

Strengthening the NAP coordination mechanism. The CCAP calls for strengthening the NCCC. Assessing and addressing the technical capacity and membership needs of the NCCC to guide the NAP process is a short-term priority of the process. It will help ensure that all development and society sectors are engaged in the iterative decision-making; create shared ownership of the process and provide

opportunities for stronger inter-agency and inter-sectoral collaboration. The participation of members of the other sectoral coordinating mechanisms in the NCCC could be a strategy to strengthen inter-sectoral collaboration. Encouraging the active participation in the NCCC of the private sector, civil society, including men, women and vulnerable groups is recommended, to ensure that their interests and needs are reflected in the NAP.

ANNEX 2. LISTS OF PARTICIPANTS TO NAP-RELATED ACTIVITIES

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Development of Saint Lucia's National Adaptation Plan (NAP)
Finance Administrative Centre, Conference Room
Pointe Seraphine, Castries

May 30, 2017

ATTENDANCE REGISTER

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3		Programme Development Officer	Andrew George
4	**MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES**		
5	**Department of Agriculture, Fisheries, Natural Resources and Cooperatives**		
6	**Agriculture**	Chief Agri. Enterprise Development Officer	Anthia Joshua
7		Economist	Carleen Joseph
8		Crop Protection Officer	Cletus Alexander
9		Agronomist	Thaddeus Constantin
10		Veterinarian	Daryl Best
11		Chief Extension Officer	Kemuel JnBaptiste

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12	**Forest and Land Resources Development**	Forest Officer/President (CYEN)	Chris Sealys
13	**Fisheries**	Fisheries Officer	Seon Ferrari
14	**Water Resources Management Agency (WRMA)**	Acting Director	Miguel Montoute
15	**Department of Physical Planning**	Chief Architect	Augustin Poyotte
16		Physical Planning Officer	Werner Houson
17		Surveyor/GIS	Philip Hippolyte
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18	**Department of Economic Development, Transport and Civil Aviation**	Economist	Tamara Lionel
19		Statistician	Uranda Xavier
20		Social Planning Officer	Dahna Jn. Charles
21	**Transport Department**	Chief Transport Officer	Lenita Joseph
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22	**Department of External Affairs**	Foreign Service Officer	Fercinta Louisy
23	**Department of Tourism and Information and Broadcasting**	Senior Tourism Officer	Deepa Girdari
24		Intern	Suzana Frederick
	MINISTRY OF HEALTH AND WELLNESS		
25	**Department of Health**	Engineer	Monty Emmanuel
26	**MINISTRY OF INFRASTRUCTURE, PORTS, ENERGY AND LABOUR**		
24	**Department of Infrastructure, Ports and Energy**	Director of Works	Al-Dean Louis Fernand
25		Meteorologist	Andre Joyeux

	NAME OF ORGANISATION	DESIGNATION	NAME
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	Department of Sustainable Development		
26	**Sustainable Development and Environment Division**	Deputy Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo
27		Sustainable Development & Environment Officer (Climate Change)	Dawn Pierre-Nathoniel
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29		DVRP/PPCR Communications Officer (Climate Change)	Lucius Doxerie
30		SDE Officer (Coastal Zone)	Lavina Alexander
31		Professional Cadet (Coastal Zone)	Maier Sifflet
32		Project Manager (MEA)	Teshia JnBaptiste
33		SDE Officer (Biodiversity)	Jannel Gabriel
34	**Renewable Energy Division**	Chief Technical Officer	Caroline Eugene
35		Science & Technology Officer	Bethia Thomas
36		Energy Officer	Benise Joseph
37	Water & Sewerage Company Inc. (WASCO)	Water Services Manager	Jim King
38		Data Processing Sup.	Joachim N. Hyacinth
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42	Saint Lucia National Trust	Programme Officer	Joanna Rosemond
43	St. Lucia Air & Sea Ports (SLASPA)	Ship Supervisor	Kerwin John
44	Insurance Council of St. Lucia (ICSL)	Chair Person of General Sub-Committee	Joralia St. Louis
45	MBC Television	Video Editor	Lyroy Husbands
46	United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)	National Focal Point	Kurt Prospere
47	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza
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DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Development of Saint Lucia's National Adaptation Plan (NAP)
Finance Administrative Centre, Conference Room
Pointe Seraphine, Castries
May 31, 2017

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8	**Fisheries**	Fisheries Officer	Seon Ferrari
9	**Water Resources Management Agency (WRMA)**	Water Resource Specialist/Acting Director	Miguel Montoute

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17		Suzana Frederick	Intern
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18	**Department of Health**	Engineer	Monty Emmanuel
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25		Project Manager (MEA)	Teshia JnBaptiste
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33	Soufriere Marine Management Association (SMMA)	General Manager	Michael Bobb
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35	Saint Lucia National Trust	Programme Officer	Joanna Rosemond
36	St. Lucia Air & Sea Ports (SLASPA)	Ship Surveyor	Kerwin John
37	United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)	National Focal Point	Kurt Prospere

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

National Adaptation Plan (NAP) Sessions

Climate Change Adaptation Media Interface Training for Government Personnel, June 21, 2017-Ministry of Infrastructure Conference Room, Union

Focus Group Discussions on Development of a Communications Strategy for the NAP and Climate Change Adaptation-Department of Sustainable Development Conference Room, Choc
June 22 and 23, 2017

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4		Agricultural Officer	Christine Glasgow

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	MINISTRY OF HEALTH AND WELLNESS		
19	**Department of Health**	Information Officer	Miguel Mauricette
20		Engineer	Monty Emmanuel
21		Director-Health Education	Natasha Lloyd-Felix

	NAME OF ORGANISATION	DESIGNATION	NAME
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38	Caribbean Youth Environment Network	National Advisor	Cathy Louis
39	International Institute for Sustainable Development	Consultant	Damon Vis-Dunbar
40		Media Communica-tions Officer	Christian Ledwell
41		Communications Specialist- NAP-Peru	Victor Santillan
42	UNDP J-CCCP	National Focal Point	Kurt Prospere

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Understanding Climate Change Adaptation in the Saint Lucia Context

A briefing for Journalists organised by the Government of Saint Lucia and the National Adaptation Planning Global Network

Coco Palm Resort

Sunday, June 25, 2017

ATTENDANCE REGISTER

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2	**Forest and Land Resources Development**	Environmental Education Officer	
	MINISTRY OF HEALTH AND WELLNESS		
3	**Department of Health & Wellness**	Director – Health Promotion	Natasha Lloyd-Felix
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
4	**Sustainable Development and Environment Division**	Permanent Secretary	Valerie Leon
5		HR Officer	Catherine Nicholas-Jean
6		DVRP Climate Change Coordinator	Susanna Scott

	NAME OF ORGANISATION	DESIGNATION	NAME
7		Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
8		Communications Officer	Lucius Doxerie
9		Information Assistant	Shannon Lebourne
10	Organisation of Eastern Caribbean States (OECS)	Coordinator - Climate Change Unit	Crispin d'Auvergne
11	STAR Publishing	Editor, Tropical Traveller	Doretta Francois
12	STAR Publishing	Reporter	Claudia Elibox
13	Calabash TV	Television Producer	Bernard Fanis
14	Independent	Principal, Jany the Journalist	Janeka Simon
15	Freelance/Elshaford Productions	Journalist/Television Producer	Onel Sanford-Belle
16	PCI Media Impact	Programs Associate	Della Ashby
17	The Voice	Journalist/Editor	Stan Bishop
18	The Mirror	Journalist	Reginald Andrew
19	Choice TV	Journalist	Janelle Norville
20	Choice TV	Journalist	Nisha Charles
21	Choice TV	Journalist/Editor	Lissa Joseph
22	Choice TV	Cameraman and Editor	Launie Justin
23	DBS	Journalist	Sharefil Gaillard
24	MBC Television	News Director	Geraine Georges
25	MBC Television	Cameraman	Sherman Isidore
26	HTS	Journalist	Miguel Fevrier

	NAME OF ORGANISATION	DESIGNATION	NAME
27	HTS	Presenter/Reporter	Alison Kentish
28	International Institute for Sustainable Development	Associate	Damon Vis-Dunbar
29	International Institute for Sustainable Development	Media & Communications Officer	Christian Ledwell
30	Ministry of the Environment, Peru	Media & Communications Officer	Victor Humberto Santillan Leiba

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Planning Process-Planning Meeting
Sectoral Adaptation Strategy and Action Plan

Agriculture and Water
Finance Administrative Centre, Pointe Seraphine, Castries

Tuesday, July 24, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	**Agriculture**	Chief Agri. Enterprise Development Officer	Anthia Joshua
2		Agronomist	Thaddeus Constantin
3		Agricultural Officer	Sancha Emmanuel-Joseph
4		Agricultural Officer	Randel Esnard
5		Region 5	Yancy Wilson
6		Region 6	Christina St. Brice
7		Region 1 & 2	Damma Jacobie
8		Region 4	Warren George
9		Region 2	Jacqueline Cornibert

	NAME OF ORGANISATION	DESIGNATION	NAME
10		Extension Officer	Jeshurn Andrew
11		Region 3	Kaymer Propheth
12		Vet and Livestock	Carleen Joseph
13	**Water Resources Management Agency (WRMA)**	Acting Director	Miguel Montoute
14		Information Systems Manager	Luther Tyson
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
	Department of Sustainable Development		
15	**Sustainable Development and Environment Division**	Deputy Chief Sustainable Development & Environment Officer (Ag)	Dawn Pierre-Nathoniel
16		DVRP/PPCR Climate Change Coordinator (Climate Change)	Susanna Scott
17		SDE Officer (Climate Change)	Neranda Maurice-George
18		SDE Officer (Biodiversity)	Jannel Gabriel
19	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
20	United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)	National Focal Point	Kurt Prospere
21	(UNDP J-CCCP) Consultant	Consultant NAP	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Planning Process
Sectoral Adaptation Strategy and Action Plan

Agriculture

Finance Administrative Centre, Pointe Seraphine, Castries

Tuesday, July 25, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	**Agriculture**	Chief Agri. Enterprise Development Officer	Anthia Joshua
2		Crop Protection Officer	Cletus Alexander
3		Agronomist	Thaddeus Constantin
4		Veterinarian	Daryl Best
5		Agricultural Officer	Sancha Emmanuel-Joseph
6		Agricultural Officer	Damma Jacobie
7		Agricultural Officer	Tricia Amedee
8		Extension Officer	Jacqueline Cornibert
9		Agriculture Officer	Elizabeth Christine Glasgow

	NAME OF ORGANISATION	DESIGNATION	NAME
10		Economist	Carleen Joseph
11	**Water Resources Management Agency (WRMA)**	Acting Director	Miguel Montoute
12		Senior Water Officer	Junior A. Mathurin
13		Acting Information Systems Manager	Luther Tyson
14	**MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND PUBLIC SERVICE**		
15		Economist	Jilayne Clery-King
16		Economist	Raijeanne Preville
17	**MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT**		
18	**Department of Sustainable Development**		
	Sustainable Development and Environment Division	Deputy Chief Sustainable Development & Environment Officer (Ag.)	Dawn Pierre- Nathoniel
19		DVRP/PPCR Climate Change Consultant (Climate Change)	Susanna Scott
20		DVRP/PPCR Communications Officer	Lucius Doxerie
21		SDE Officer (Climate Change)	Neranda Maurice-George
22		SDE Officer (Biodiversity)	Jannel Gabriel
23		SDE Officer (Orzone)	Kasha Jn.Baptiste
24	Water & Sewerage Company Inc. (WASCO)	Water Services Manager	Jim King
23	Saint Lucia Development Bank (SLDB)	Manager Business Development & Marketing	Philbert Francis
24	St. Lucia Association of Bee Keeper	Board Member	Emmanuel St. Croix
25		Farmer	Joseph Valcin

	NAME OF ORGANISATION	DESIGNATION	NAME
26		Farmer	Samuel K. Lubin
27	Farmer /Floral Cooperative	Farmer	Angus Philogene
28		Farmer	Helena Thomas
29		Farmer	Yvette David
30			Esther St. Marie
31		Farmer	Teresa Emmanuel
32	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
33	United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)	National Focal Point	Kurt Prospere
34	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Planning Process
Sectoral Adaptation Strategy and Action Plan

Agriculture

La Caye Inland Reception and Distribution Center (IRDC)

Wednesday July, 26, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	Agriculture	Deputy Chief Forest Officer	Alfred Prospere
2		Livestock Officer	Allan Oculien
3		Forest Officer	Karl Augustine
4	**Water Resources Management Agency (WRMA)**	Water Resource Officer	Mervin Engeliste
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
	Department of Sustainable Development		
5	**Sustainable Development and Environment Division**	Acting Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel

	NAME OF ORGANISATION	DESIGNATION	NAME
6		DVRP/PPCR Climate Change Coordinator (Climate Change)	Susanna Scott
7	Bazil Farmer, Dennery	Farmer	Shirley Biscette
8	Micoud Farmer	Farmer	Cecilia Alexander
9		Farmer	Alwin Jules
10		Farmer	Marcelline Louisy
11		Farmer MRWO	Cecilia Dorleon
12		Farmer	Camillia Biscette
13		Farmer	Anna Clercent
14			Joseph Alfred
15			Christopher Taliam
16			Jeffrey Edwin
17			Herbert Thomas
18			Lazarus Constantin
20			Thaddeus McLorrain
21	Eastern Agri. Business Cooperative		Jules Celestin
22	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Planning Process
Sectoral Adaptation Strategy and Action Plan

Water

Golden Palm Conference Room, Rodney Heights, Gros-Islet

Thursday, July 27, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	OFFICE OF THE PRIME MINISTER		
1	**Office of the Prime Minister**	Deputy Permanent Secretary	Irene St. Croix
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
2	**Agriculture**	Chief Agricultural Enterprise Development Officer	Anthia Joshua
3		Agricultural Officer	Sancha Emmanuel-Joseph
4		Agricultural Officer	Joel Ramine
5		Agricultural Officer	Charis Auguste-Powell
6	**Forest and Land Resources Development**	Assistant Chief Forest Officer	Alwin Dornelly
7	**Fisheries**	Chief Fisheries Officer	Sarita Williams-Peter

	NAME OF ORGANISATION	DESIGNATION	NAME
8		Fisheries Assistant	Junior Joseph
9		Fisheries Biologist	Allena Joseph
10	**Water Resources Management Agency (WRMA)**	Acting Director	Miguel Montoute
11		Project Manager	Rupert Lay
12			Junior A. Mathurin
13		Acting Information Systems Manager	Luther Tyson
14		Water Resource Officer	Sanjay Richardson
15		Water Resource Officer	Charlie Prospere
16	**Cooperatives**	Cooperative Officer	Nadine Estephen-George
17	**Department of Physical Planning**	Physical Planning Officer	Jasmine Weekes
18		Cartographer	Suzanna Aurelien
	MINISTRY OF ECONOMIC DEVELOPMENT, HOUSING, URBAN RENEWAL, TRANSPORT AND CIVIL AVIATION		
19	**Department of Economic Development, Transport and Civil Aviation**	Chief Economist	Kerry Joseph
21		Economist	Macricia Bushell
22		Social Planning Officer	Dahna Jn. Charles
23		Economist Assistant	Nadine S. Isidore
	MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND PUBLIC SERVICE		
24	**Department of Tourism & Information & Broadcasting**	Building Officer	Timothy Ferdinand
25	**Department of Commerce, International Trade, Investment, Enterprise Development and Consumer Affairs**	Economist	Ruthanne Phillip

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF HEALTH AND WELLNESS		
26	**Environmental Health Division**	Environmental Officer	Sementha Tisson
	MINISTRY OF EQUITY, SOCIAL JUSTICE, EMPOWERMENT, YOUTH DEVELOPMENT, SPORTS, CULTURE AND LOCAL GOVERNMENT		
27	**Policy Planning and Administrative Services**	Policy & Programme Officer	Eulampus Frederick
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
28	**Sustainable Development and Environment Division**	Deputy Chief Sustainable Development & Environment Officer (Ag.)	Dawn Pierre-Nathoniel
29		DVRP/PPCR Climate Change Coordinator (Climate Change)	Susanna Scott
30		DVRP/PPCR Communications Officer	Lucius Doxerie
31	**Saint Lucia Development Bank (SLDB)**	Business Development Marketing Manager	Philbert Francis
32	Water & Sewerage Company Inc. (WASCO)	Water Services Manager	Jim King
33	Caribbean Water & Sewerage Association Inc. (CAWASA)	Executive Director	Ignatius Jean
34	CARPHA	Programme Manager	Shermaine Clauzel
35	Soufriere Marine Management Association (SMMA)	General Manager	Michael Bobb
36	Saint Lucia National Trust (SLNT)	Natural Heritage Programme Officer	Joanna Rosemond
37	Nation Utilities Regulatory Commission (NURC)	Water Specialist	Terrance Gillard
38	C.O. Williams	Quantity Surveyor	Tryle Loctar-Polius

	NAME OF ORGANISATION	DESIGNATION	NAME
39	C.O. Williams	Architectural Technician	Lyndel Norville
40	~~SLECL Ltd.~~	Operations Manager	Kennedy St. Omer
41	Sunfresh Ltd sub. of WINFRESH	General Manager	Tessa Boland
42	SMJ Beverages Ltd.	QA Supervisor	Kemn Joseph
43	Bamboo Springs Ltd.	Manager	Martin Martin
44	Piton Water	Managing Director	Patrick Joseph
45	FDL Consult Inc.	Programme Manager	Pewlin Fontenard
46	Rambally's Funeral Home	Office Administrator	Josephine Moore
47	St. Lucia Distillers Ltd.	Water Treatment Manager	Wilson Sifflet
48	Peter's Holiday Ltd.	Service Manager	Elijah Ferguist
49	Concrete & Aggregates	Accounts Clerk	Melissa Alexander
50	Anse-La-Raye Constituency Council	Vice Chairman	Reeves Lawrence
51	Choiseul Constituency Council	Deputy Chairperson	Tassa Jean
52	Laborie/Augier Constituency Council	Chairperson	Henry Amedee
53	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
54	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Planning Process
Sectoral Adaptation Strategy and Action Plan

Agriculture

Department of Fisheries Training Room, Vieux Fort

Wednesday, August 2, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
1	**Department of Agriculture, Fisheries, Natural Resources and Cooperatives**		
2	Agriculture	Agronomist	Thaddeus Constantin
3		Agricultural Officer	Leoreta Dulice
4		Agriculture Extension Officer	Jeanmi Camielle
5		Extension Officer B.A.S.	Craig Palton
7		Agriculture Extension Officer	Maralaiah Auguste
8		Extension Division Region 5	Yancy Wilson
9	Water Resources Management Agency (WRMA)	Water Resource Officer	Mervin Engeliste
10	Black Bay Farmers & Consumers Co-operative Society	Farmer Region 5	Jovan Beausoleil

	NAME OF ORGANISATION	DESIGNATION	NAME
11	Orising Brothers Honey Producers	Farmer Region 5	John Charlemagne
12		Farmer Region 5	Rudy Fletcher
13		Farmer Region 5	Ursuline Charlery
14		Farmer Region 5	Skeeter Edward
15		Farmer Region 5	Len Charles
16	Orising Brothers	Farmer	Joseph Isidore
17	Black Bay Farmer	Marketing Officer	Charline Francis
18	Fresh Eggs	Manager	Henry Wilson
19	Belle-Vue Kitchen Garden Group	Chairperson	Kate ~~Edmie~~
20		Farmer Secretary	Kurline Johnny
21	Grace Group	Farmer	Earl St. Marie
22		Farmer	Isaac Maurice
23	Cocoa Vigier	Farmer	Peterson JnCharles
24	Saltibus	Farmer	Dillet Isaac
25	Jetrine		Edmund Dantes
26		Farmer	Lessa Serville
27	Vest Farms	Director	Gasper George
28		Owner	Gilbert Isaac
29		Farmer	Newton Eristhee

	NAME OF ORGANISATION	DESIGNATION	NAME
30		Agriculturist	Francis Blanchard
31		Farmer	Guy K. Charlery
32	Augier	Farmer	Wycliffe Tobierre
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
33	**Sustainable Development and Environment Division**	SDED Officer	Neranda Maurice-George
34	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
35	United Nations Development Programme Japan-Caribbean Climate Change Partnership (UNDP J-CCCP)	National Focal Point	Kurt Prospere
36	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Plan (NAP) Process
Sectoral Adaptation Strategy and Action Plan
Agriculture
Department of Fisheries Conference Room, Castries

Thursday August 3, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
1	**Department of Agriculture, Fisheries, Natural Resources and Cooperatives**		
1	**Agriculture**	Agronomist	Thaddeus Constantin
2		Animal Husbandry Officer	Daryl Best
3		Agricultural Officer	Kisha Jacob
4		Agricultural Officer	Yvonne L. Francis
5		Agricultural Officer	Christine Glasgow
6		Agricultural Officer	Edwin Henry
7		Extension Officer	Natasha Edgar
8		Information Systems Manager	Luther Tyson
9	**Fisheries**	Fisheries Assistant	Kate St. Mark
10	**Water Resources Management Agency (WRMA)**	Water Resource Officer	Charlie Prospere
11		Water Resource Officer	Mervin Engalisle

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF ECONOMIC DEVELOPMENT, HOUSING, URBAN RENEWAL, TRANSPORT AND CIVIL AVIATION		
12	**Department of Economic Development, Transport and Civil Aviation**	Assistant Economist	Nadine S. Isidore
	MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND PUBLIC SERVICE		
13	**Finance**	Budget Analyst	Bradely St. Ange
14	**Department of Tourism and Information and Broadcasting**	Senior Tourism Officer	Deepa Girdari
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
15	**Department of Sustainable Development**	SDED Officer	Neranda Maurice-George
16	Region 8 Farmer	Farmer	Venisa Chassang
17		Farmer	Peter Toussaint
18		Farmer	Alban Charles
19			Clint Auguste
20		Farmer	Trevans Johnny
21		Farmer	Clement St. Hill
22		Farmer	Juliana Aurelien
23		Farmer	Muton Goucain
24	(UNDP J-CCCP)	National Focal Point	Kurt Prospere
26	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
27	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Plan (NAP) Process-Planning Meeting
Development of a Sectoral Adaptation Strategy and Action Plan (SASAP) for the Fisheries Sector

Department of Fisheries Conference Room
Pointe Seraphine, Castries
Friday, October 20, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	**Fisheries**	Chief Fisheries Officer	Sarita Williams-Peter
2		Deputy Chief Fisheries Officer	Thomas Nelson
3		Fisheries Biologist	Shanna Emmanuel
4		Fisheries Officer	Vaughn Serieux
5		Fisheries Assistant	Yvonne Edwin
6		Fisheries Assistant	Junior Joseph
7		Fisheries Assistant/ Extension Officer	Rita Straughn
8		Fisheries Assistant	Daniel Medar

	NAME OF ORGANISATION	DESIGNATION	NAME
9		Fisheries Assistant	Patricia Hubert-Medar
10		Fisheries Extension Officer	Petronila Polius
11		Volunteer	Onella Zephirin
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
	Department of Sustainable Development		
12	**Sustainable Development and Environment Division**	Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
13		DVRP/PPCR Climate Change Coordinator (Climate Change)	Susanna Scott
14	Eden Environmental Consulting Ltd	Consultant	Jason Yapp
15	UNDP J-CCCP	Kurt Prospere	National Focal Point
16	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Plan (NAP) Process
Development of a Sectoral Adaptation Strategy and Action Plan (SASAP) for the Fisheries Sector

Department of Fisheries Training Room, Vieux Fort

Sunday October 22, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	Fisheries	Fisheries Officer	Vaughn Serieux
2		Fisheries Assistant	Rita Straughn
3		Fisheries Assistant	Daniel Medar
4		Extension Officer	Hardin JnPierre
7	Choiseul Fishermen's Cooperative	Fisher	Devon Stephen
8		Fisher	Brent Stephen
9		Fisher Boat Owner	Felix Epiphane
10	Dennery Fishermen	Fisher	Raymond William
11		Fisher	Hiliare Eugene
12		Fisher	Joseph Sealy

	NAME OF ORGANISATION	DESIGNATION	NAME
13		Fisher	Olner William
14		Fisher	Kennedy President
15		Fisher	Nicholas Joseph
16	Soufriere Fishermen	Fisher/Boat Owner	St. Robert Sylvester
17		Fisher	Hugh Joseph
18		Fisher/Boat Owner	Protus Prospere
19		Fisher/Boat Owner	Raphael Desir
20		Fisher/Boat Owner	Vincent Nathoniel
21	Laborie Fishermen	Fisher	Helen Duncan
22		Fisher	Johnny Mason
23	Savannes Bay	Fisher	Richie Robert
24	Vieux Fort	Fisher/Boat Owner	Mac Clement St. Rose
25	Micoud	Fisher/Boat Owner	Travis Derose
26		Seamoss Farmer	Jerome Justin
27	Equipment Vieux Fort	Seamoss Farmer	Cletus Fadlin
28		Seamoss Farmer	Edwin Francis
29		Seamoss Farmer	Furlisha Francis
30	UNDP J-CCCP	National Focal Point	Kurt Prospere
31	UNDP J-CCCP	Consultant	Clara Ariza
32	Eden Environmental Consulting Ltd	Consultant	Jason Yapp

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Plan (NAP) Process
Development of a Sectoral Adaptation Strategy and Action Plan (SASAP) for the Fisheries Sector

Department of Fisheries Conference Room
Pointe Seraphine, Castries

Monday October 23, 2017
ATTENDANCE REGISTER

	NAME OF ORGANISATION	NAME	DESIGNATION
1	**Anse-La-Raye**	Remy Jameson	Boat Owner
2		Stanley Mitchel	Fishers
3	**Babonneau**	Arthur Alphonse	Shrimp Aquaculture
4		Leon Gittens	Boat Owner
5		Clinton L. Reynolds	Boat Owner/President
6		Sylvester N. Nedd	Fisherman/Boat Owner
7	**Canaries**	Gillian Lansiquot	Boat Owner
8		Hugh Jules	Fishers
9		Frederick Solomon	Fishers
10		Eldric Bernard	Boat Owner

	NAME OF ORGANISATION	NAME	DESIGNATION
11	**Castries**	Hugh Rodney	Boat Owner
12		Jessie Felix	Fishers
13		Francis Compton	Fishers
14		Mervin JnBaptiste	Fishers
15		Ian Plummer	Fishers
16		Vincent Samuel	Fishers
17		Ricky Flavey	Fishers
18		Callistus JnBaptiste	Fishers
19		Alva Lynch	Fishers Cooperative
20	**Gros Islet**	Tera Victor	Boat Owner
21		Ian Joseph	Fishers
22		Erskin Bernard	Fishers
23		Eugene Edwin	Fishers
24		Ellick Prospere	Fishers
25		Nicodemas Paul	Fishers
26		Alva Leonce	Boat Owner
27		Ernest Inglis	Boat Owner
28		Collins Prospere	Boat Owner
29		Marcellus St. Ange	Boat Owner

	NAME OF ORGANISATION	NAME	DESIGNATION
30		Stanley Mitchel	Boat Owner
31		Gilbert Bruneau	Boat Owner
32		Jameson Remy	
33	Eden Environmental Consulting Ltd	Jason Yapp	Consultant
34	(UNDP J-CCCP) Consultant	Clara Ariza	Consultant

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

Saint Lucia's National Adaptation Plan (NAP) Process
Development of a Sectoral Adaptation Strategy and Action Plan (SASAP) for the Fisheries Sector

Finance Administrative Centre, Conference Room
Pointe Seraphine, Castries

Tuesday October 24, 2017

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	Fisheries	Chief Fisheries Officer	Sarita Williams-Peter
2		Fisheries Biologist	Shanna Emmanuel
3		Fisheries Assistant	Yvonne Edwin
4		Fisheries Extension Officer	Petronila Polius
5		Volunteer	Onella Zephirin
5	Water Resources Management Agency (WRMA)	Water Resource Officer	Mervin Engeliste
6		Water Resource Officer	Junior Mathurin
7	**Department of Physical Planning**	Physical Planning Officer	Werner Houson
8		Surveyor	Philip Hippolyte

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF HOME AFFAIRS, JUSTICE AND NATIONAL SECURITY		
9	**Department of Home Affairs and National Security**	Sergeant, Marine Unit	Wilbur Etienne
10		Police, Marine Unit	Irvin Alfred
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
	Department of Sustainable Development		
11	Sustainable Development and Environment Division	Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
12		SDE Officer (SIDS Development Agenda)	Jeanel Volney
13		Professional Cadet	Maier Sifflet
14		Environment Technician	Jurina Constantine
15	Protected Areas Management	Manager, Protected Areas/ PMA President	Augustine Dominique
16	National Conservation Authority (NCA)	Operations Manager	Nehemiah Charles
17	St. Lucia Air & Sea Ports Authority (SLASPA)	Ship Surveyor	Kerwin John
18	Saint Lucia Hotel & Tourism Association (SLHTA)	Liaison Officer Agriculture, Tourism	Donette Ismael
19	Castries Fishermen's Cooperative Society Ltd. (SLFCSL)	Manager	Alva Lynch
20	Soufriere Marine Management Association (SMMA)	General Manager	Michael Bobb
21	Body Holiday Le Sport	Scuba Manager	Daniel Joseph

	NAME OF ORGANISATION	DESIGNATION	NAME
22	Castries Fishermens Cooperative Society Ltd. (SLFCSL)	Manager	Alva Lynch
23	Dennery Fishermen's Cooperative	President	Daniella
24		Operations Supervisor	Agnita Thomas
25	Gros Islet Fishermen's Cooperative	Vice President	Ian Joseph
26		Treasurer	Julietta Herman
27		Manager	Joanna Melville
28	East Coast Fishers & Consumers Co-operative	President	Peter Joseph
29	St. Lucia Fisher Folk	Secretary	Darren Leon
30	Vieux Fort Small Farmers Group	Seamoss Farmer	Cletus Fadlin
31	Rainforest Seafoods		Darnel Ian Duncan
32	Stemar Products	Production Operations Manager	Marie Christophe
33	St. Lucia Fish Marketing Corporation (S.L.F.M.C)		Travis Derose
34	Lazy Lagoon	General Manager	Wadi Zakhoor
35	Praslin Seamoss Association	Secretary	Paula Serieux
36		Seamoss Farmer	Furlisha Francis
37		Seamoss Farmer	Chantal Descart
38		Seamoss Farmer	Michelle Isidore
39	Eden Environmental Consulting Ltd	Consultant	Jason Yapp

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

National Adaptation Plan (NAP) Focus Group Session
Agriculture & Fisheries

Finance Administrative Building, Conference Room
Tuesday, February 13, 2018
8:30 p.m. – 12:30p.m.

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
1	**Agriculture**	Acting Director of Agriculture Services	Alicia Daniel George
2		Economist	Charlin Louisy
3		Agricultural Officer	Apral Deterville
4		Farm Improvement Officer	Randel Esnard
5		Chief Extension Officer	Kemuel JnBaptiste
6		Agronomist	Thaddeus Constantin
7		Crop Protection Officer	Cletus Alexander
8	**Fisheries**	Chief Fisheries Officer	Sarita Peter

	NAME OF ORGANISATION	DESIGNATION	NAME
9		Fisheries Biologist	Charlie Prospere
10		Fisheries Officer	Vaughn Serieux
11		Fisheries Extension Officer	Petronila Polius
12		Fisheries Extension Officer	Hardin JnPierre
13		Volunteer	Onella Zephrin
14	**Water Resources Management Agency (WRMA)**	Senior Water Officer	Junior A. Mathurin
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
	Department of Sustainable Development		
15	**Sustainable Development and Environment Division**	Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo
16		Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
17		SDE Officer (Chemicals)	Yasmin Jude
18		SDED Officer (Climate Change)	Snaliah Mahal
19		SDE Officer (Climate Change)	Shanna Emmanuel
20	(UNDP J-CCCP) Consultant	Consultant	Clara Ariza

DEPARTMENT OF SUSTAINABLE DEVELOPMENT
National Adaptation Plan (NAP) Focus Group Session
Water

Finance Administrative Building, Conference Room
Tuesday February 13, 2018
1:30 p.m. – 4:30p.m.

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
1	**Forestry and Land Resources Development**	Acting Chief Forest Officer	Alwin Dornelly
2	**Water Resources Management Agency (WRMA)**	Project Manager	Rupert Lay
3		Acting Director	Miguel Montoute
4		Senior Water Officer	Junior A. Mathurin
5		Acting Information Systems Manager	Luther Tyson
6			Cantarra Cooper
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
7	**Department of Sustainable Development**		
8		Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo

	NAME OF ORGANISATION	DESIGNATION	NAME
9	**Sustainable Development and Environment Division**	Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
10		SDE Officer (Chemicals)	Yasmin Jude
11		SDE Officer (Climate Change)	Snaliah Mahal
12		SDE Officer (Climate Change)	Shanna Emmanuel
13	Water & Sewerage Company Inc. (WASCO)	Water Services Manager	Jim King

DEPARTMENT OF SUSTAINABLE DEVELOPMENT

National Adaptation Plan (NAP) Validation Workshop

Finance Administrative Centre, Conference Room
Pointe Seraphine, Castries

Thursday, February 15, 2018

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME
	OFFICE OF THE PRIME MINISTER		
1	**Office of the Prime Minister**	Programme Manager	Josette Maxwell Dolson
2	**National Emergency Management Organization (NEMO)**	Programme Development Officer	Andrew George
3		Communications Manager	Maria Medard
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES		
	Department of Agriculture, Fisheries, Natural Resources and Cooperatives		
4	**Agriculture**	Chief Agricultural Enterprise Development Officer	Anthia Joshua
5		Crop Protection Officer	Cletus Alexander
6		Agronomist	Thaddeus Constantin

	NAME OF ORGANISATION	DESIGNATION	NAME
7		Veterinarian	Daryl Best
8	**Forest and Land Resources Development**	Acting Chief Forest Officer	Alwyn Dornelly
9		Environmental Education Officer	Feria Gaston
11		Research Officer	Donatian Gustave
12	**Fisheries**	Chief Fisheries Officer	Sarita Williams-Peter
13		Deputy Chief Fisheries Officer	Thomas Nelson
14		Fisheries Biologist	Allena Joseph
15	**Water Resources Management Agency (WRMA)**	Acting Director	Miguel Montoute
16		Project Manager	Rupert Lay
17		Senior Water Officer	Junior A. Mathurin
18		Acting Information Systems Manager	Luther Tyson
19		Field Scientist	Cantarra Cooper
20	**Department of Physical Planning**	Physical Planning Officer	Jasmine Weekes
21		Surveyor	Philip Hippolyte
	MINISTRY OF ECONOMIC DEVELOPMENT, HOUSING, URBAN RENEWAL, TRANSPORT AND CIVIL AVIATION		
22	**Department of Economic Development, Transport and Civil Aviation**	Economist	Tamara Lionel
		Economist	Perle Alcindor
23		Economist	Macricia Bushell
24		Social Planning Officer	Dahna Jn. Charles
	MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND PUBLIC SERVICE		
25	**Research and Policy**	Economist	Nalisa Marieatte

	NAME OF ORGANISATION	DESIGNATION	NAME
26	**Department of Tourism and Information and Broadcasting**	Tourism Officer	Deepa Girdari
	MINISTRY OF HEALTH AND WELLNESS		
27	**Department of Health**	Social Planning Officer	Jackie Joseph
28		Environmental Health Officer	Sementha Tisson
	MINISTRY OF INFRASTRUCTURE, PORTS, ENERGY AND LABOUR		
29	**Department of Infrastructure, Ports and Energy**	Superintendent of Works	Al-Dean Louis Fernand
30	**Meteorological Services**	Met. Officer IV	Vigil Saltibus
31		Meteorologist	Andre Joyeux
32	**Transport Department**	Chief Transport Officer	Lenita Joseph
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT		
33	**Department of Education**	Consultant	Sonia Polius
34		Teacher Assigned	Hyacinth Dorleon
	Department of Sustainable Development		
35	**Sustainable Development and Environment Division**	Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo
36		Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel
37		SDE Officer (Climate Change)	Snaliah Mahal
38		SDE Officer (Climate Change)	Shanna Emmanuel
39		Administrative Officer (DVRP) (Climate Change)	M. Sharon Charles

	NAME OF ORGANISATION	DESIGNATION	NAME
40		SDE Officer (Chemicals)	Yasmin Jude
41		SDE Officer (SIDS Development Agenda)	Jeanel Volney
42		SDE Officer (Biodiversity)	Jannel Gabriel
44	**Renewable Energy Division**	Science & Technology Officer	Danielle Gordon
45		Energy Officer	Charlin Bodley
46	**Protected Areas Management**	Manager, Protected Areas/ PMA	Augustine Dominique
47	Water & Sewerage Company Inc. (WASCO)	Data Processing Sup.	Joachim N. Hyacinth
48	French Embassy	Project Officer	Lucienne Mason
49	Organisation of Eastern Caribbean States (OECS)	Programme Officer	Norma Cherry-Fevrier
50	Soufriere Marine Management Association (SMMA)	Manager	Michael Bobb
51	Caribbean Water & Sewerage Association Inc. (CAWASA)	Executive Director	Ignatius jean
52	Saint Lucia National Trust	Programme Officer Conservation	Craig Henry
53	(UNDP J-CCCP) Consultant	Consultant NAP	Clara Ariza

National Adaptation Plan (NAP) Assembly

Training in the Development of Sectoral Adaptation Strategies and Action Plans (SASAPs) for Saint Lucia

Finance Administrative Centre, Conference Room
Pointe Seraphine, Castries

Monday April 16, 2018

ATTENDANCE REGISTER

	NAME OF ORGANISATION	DESIGNATION	NAME	GENDER
	OFFICE OF THE PRIME MINISTER			
1	**National Emergency Management Organization (NEMO)**	Programme Manager	Josette Maxwell Dalsou	F
2		Programme Development Officer	Andrew George	M
	MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND PUBLIC SERVICE			
3	**Department of Finance**	Budget Analyst	Merelicia Collymore	F
4	**Department of External Affairs**	Foreign Affairs Officer	Fercinta Louisy	F
5	**Department of Commerce, International Trade, Investment Enterprise Development and Consumer Affairs**	Commerce and Industry Officer	Esli Lafeuillee	M

	NAME OF ORGANISATION	DESIGNATION	NAME	GENDER
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES			
6	**Department of Agriculture, Fisheries, Natural Resources and Cooperatives**	Deputy Director Agricultural Services	Barrymore Innocent	M
7		Economist	Carleen Joseph-Atkins	F
8		Crop Protection Officer	Cletus Alexander	M
9		Fisheries Biologist	Allena Joseph	F
10		Fisheries Extension Officer	Petronila Polius	F
11		Research Officer	Donatian Gustave	M
12		Wildlife Conservation Officer, Forestry	Pius Haynes	M
13		Veterinary Officer	Sharmine Melville-Edwin	F
14		Field Scientist	Cantarra Cooper	F
15	**Department of Physical Planning**	Chief Architect	Augustin Poyotte	M
16		Senior Cartographer	Suzanna Aurelien	F
17		Civil Engineer	Jeanelle Fevrier-Popo	F
18		Commissioner of Crown Lands	Bernella Charlemagne	F
	MINISTRY OF ECONOMIC DEVELOPMENT, HOUSING, URBAN RENEWAL, TRANSPORT AND CIVIL AVIATION			
19	**Department of Economic Development, Transport and Civil Aviation**	Economist	Charlin Louisy	F
20		Economist	Macricia Bushell	F
21	**Department of Housing, Urban Renewal and Telecommunications**	Housing Officer	Lorraine Matthew	F
	MINISTRY OF EQUITY, SOCIAL JUSTICE, EMPOWERMENT YOUTH DEVELOPMENT, SPORTS, CULTURE AND LOCAL GOVERNMENT			

	NAME OF ORGANISATION	DESIGNATION	NAME	GENDER
22	**Department of Equity, Social Justice, Empowerment and Human Services**	Deputy Permanent Secretary	Dawn French	F
23		Social Transformation Officer	Doreen Gustave	F
	MINISTRY OF HEALTH AND WELLNESS			
24	**Department of Health**	Director, Bureau of Health Education	Natasha Lloyd-Felix	F
25		Environmental Health Officer	Arthur Antoine	M
26		Engineer	Monty Emmanuel	M
27		Social Planning Officer	Jackie Joseph	F
	MINISTRY OF INFRASTRUCTURE, PORTS, ENERGY AND LABOUR			
28		Energy Officer, Renewable Energy Division	Benise Joseph	M
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT			
29	**Department of Education**	Gender Relations Officer	Rohn Peter	M
30		Teacher Assigned to Corporate Planning Unit	Hyacinth Dorleon	F
31		Teacher Assigned to Corporate Planning Unit	Edith Emmanuel	F
	Department of Sustainable Development			
32	**Sustainable Development and Environment Division**	Acting Permanent Secretary	Debra Charlery	F
33		Acting Deputy Permanent Secretary	Caroline Eugene	F
34		Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo	F
35		Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel	F
36		Professional Cadet	Snaliah Mahal	F
37		SDE Officer	Shanna Emmanuel	F

	NAME OF ORGANISATION	DESIGNATION	NAME	GENDER
38		Communications Officer (DVRP)	Lucius Doxerie	M
39		Administrative Officer (DVRP)	Marcia Sharon Charles	F
40		Secretary DPS	Merrill John DuBoulay	F
41		SDE Officer, Chemicals	Yasmin Jude	F
42		SDE Officer, Coastal Zone Management	Lavina Alexander	F
43		SDE Officer	Maier Sifflet	F
44		Environment Technician	Jurina Constantine	F
45		Office Assistant	Cleopatra Anthony	F
46		SDE Assistant	Peter Leviticus St. Marie	M
47		Project Assistant	Angela St. Denise	F
48		Legal Officer	Kate Wilson	F
49		Science & Technology Officer	Danielle Gordon	F
50		Project Manager, Protected Areas Management	Augustine Dominique	M
51	Water & Sewerage Company Inc. (WASCO)	Data Processing Manager	Joachim Nicholai Hyacinth	M
52	Saint Lucia Air & Sea Ports Authority	Director of Maritime Affairs	Christopher Alexander	M
53	Saint Lucia Solid Waste Management Authority	Deputy General Manager	Laurianus Lesfloris	M

	NAME OF ORGANISATION	DESIGNATION	NAME	GENDER
54	Organisation of Eastern Caribbean States (OECS)	Programme Coordinator for Climate & Disaster Risk Management	Crisipin d'Auvergne	M
55		Communications Officer	Phillip Cupid	M
56	International Institute for Sustainable Development (IISD)	Senior Researcher	Alec Crawford	M
57	US State Department	Project Manager	Lauren Oshman	F
58	Japan-Caribbean Climate Change Partnership/United Nations Development Programme (JCCCP - UNDP)	Technical Specialist	Neisha Manickchand	F
59	J-CCCP/UNDP	National Focal Point	Kurt Prospere	M
60		Consultant	Clara Ariza	F

National Adaptation Plan (NAP) Assembly
Special Session for Creators (Artists and Performers)

Finance Administrative Centre, Conference Room, Pointe Seraphine, Castries

Tuesday April 17, 2018

ATTENDANCE REGISTER

	NAME	SPECIALISATION	COMMUNITY/ COMPANY	GENDER
1.	Eola Alexander	Freelance Graphic Designer	Saltibus/Sakey Productions	F
2.	Milton Branford	Managing Director	Malfinis Film & Animation Studios Inc.	M
3.	Delthia Naitram	Visual Artist/Teacher	Castries	F
4.	Sophie Klien	Visual Artist	CYEN/VFS DYSC	F
5.	Ted Sandiford	Artist		M
6.	Aneurin Edward	Visual Artist		M
7.	Francis Butcher	Visual Artist	Malfinis Film & Animation Studios Inc.	M
8.	Sabrina Romulus	Visual Artist		F

	NAME	SPECIALISATION	COMMUNITY/ COMPANY	GENDER
9	Shamar Marcus	Video/Photo	Skycrew Films	M
10.	Alex Grant	Graphic Artist/Artist/ Writer		F
11.	Joy Grant	Artist		F
12.	Richard Ambrose	Dance	RADIP Dance Theatre	M
13.	Cecil Charles	Manager		M
14.	TC Brown	Calypsonian		M
15.	Chera Cherubin			F
16.	Barbara Jacobs-Small	Managing Director	Right Angle Imaging	F
17.	Adam Cadette	Artist		M
18.	Nerrill Rismay	Visual Artist, Teacher	TVET	M
19.	Mygell Felix	Photographer		M
20.	Dawn French	Writer		M
21.	Fernelle Neptune	Information Assistant	Ministry of Education	F
22.	Vitanee Blasse		SALCC	F
23.	Dwayne Clarke		RAPID	M
24.	Shirley Ann Edward	Visual Artist		F
25.	Dean Walton	Video Production		M
26.	Phillip Cupid	Communication Officer	OECS	M

	NAME	SPECIALISATION	COMMUNITY/ COMPANY	GENDER
27.	Debra Charlery	Acting Permanent Secretary	Department of Sustainable Development (DSD)	F
28.	Caroline Eugene	Acting Deputy Permanent Secretary	DSD	F
29.	Kate Wilson	Legal Officer	DSD	F
30.	Annette Rattigan-Leo	Chief Sustainable Development and Environment Officer	DSD	F
31.	Dawn Pierre-Nathoniel	Deputy Chief Sustainable Development and Environment Officer	DSD	F
32.	Snaliah Mahal	Professional Cadet	DSD	F
33.	Shanna Emmanuel	SDE Officer	DSD	F
34.	Lucius Doxerie	Communications Officer (DVRP)	DSD	M
35.	Yasmin Jude	SDE Officer	DSD	F
36.	Marcia Sharon Charles	Administrative Officer (DVRP)	DSD	F
37.	Merrill DuBoulay	DPS' Secretary	DSD	F
38.	Maier Sifflet	SDE Officer	DSD	F
39.	Cleopatra Anthony	Office Assistant	DSD	F
40.	Jurina Constantine	Environment Technician	DSD	F
41.	Angela St. Denis	Project Assistant	DSD	F
42.	Kurt Prospere	National Focal Point	UNDP-JCCCP	M
43.	Neisha Manickchand	Technical Specialist	UNDP	F

	NAME	SPECIALISATION	COMMUNITY/ COMPANY	GENDER
44.	Henry Mangal		UNDP	M
45.	Anne Hammill	Director	IISD	F
46.	Alec Crawford	Senior Researcher	IISD	M
47.	Lauren Oschman	Project Manager	US State Department	F

National Adaptation Plan (NAP) Assembly for Saint Lucia
Special Session for Ministers, Permanent Secretaries and Heads of Departments

Finance Administrative Centre,
Conference Room Pointe Seraphine,
Castries
Tuesday, April 17, 2018

ATTENDANCE REGISTER

#	MINISTRY	DESIGNATION	NAME	GENDER
	OFFICE OF THE PRIME MINISTER			
1		Cabinet Secretary	Ben Emmanuel	M
2		Programme Development Officer, NEMO	Andrew George	M
	MINISTRY OF FINANCE, ECONOMIC GROWTH, JOB CREATION, EXTERNAL AFFAIRS AND THE PUBLIC SERVICE			
3	**Department of Finance**	Director of Finance/Permanent Secretary	Cointha Thomas	F
4		Director, National Competitiveness and Productivity Council	Fiona Hinkson	F
5		Chief Economist Research and Policy of Finance	Jemma Lafeuille	F
6		Deputy Chief Economist, Research and Policy	Janai Leonce	M

#	MINISTRY	DESIGNATION	NAME	GENDER
7	**Department of External Affairs**	Deputy Permanent Secretary	Elizabeth Bailey	F
8		Foreign Service Officer	Maria Jean Baptiste	F
9	**Department of Commerce, International Trade, Investment Enterprise Development and Consumer Affairs**	Minister	Hon. Bradley Felix	M
10		Permanent Secretary	Titus Preville	M
11	**Department of Tourism and Information and Broadcasting**	Director, Product Development Officer	Ann Margaret Adams	F
	MINISTRY OF AGRICULTURE, FISHERIES, PHYSICAL PLANNING, NATURAL RESOURCES AND COOPERATIVES			
12	**Department of Agriculture, Fisheries, Natural Resources and Co-operatives**	Permanent Secretary	John Calixte	M
13		Deputy Director of Agricultural Services	Barry Innocent	M
14		Chief Extension Officer	Kemuel Jn.Baptiste	M
15		Agricultural Engineer	Kwesi Goddard	M
16		Crop Protection Officer	Cletus Alexander	M
17		Research Officer (Forestry)	Donatian Gustave	M
18		Deputy Chief Fisheries Officer	Thomas Nelson	M
19		Director, Water Resources Management Agency (WRMA)	Miguel Montoute	M
20	**Department of Physical Planning**	Minister	Hon. Herod Stanislaus	M
21		Permanent Secretary	Daune Louisy	M
22		Chief Architect	Augustin Poyotte	M
23		Chief Physical Planning Officer	Karen Augustine	M

#	MINISTRY	DESIGNATION	NAME	GENDER
	MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT			
24	**Department of Education, Innovation and Gender Relations**	Minister	Hon. Dr. Gale T.C. Rigobert	F
25		Deputy Permanent Secretary	Michelle Charles	F
26		District Education Officer (District 1)	Cyrus Cepal	M
27		Director, Gender Relations	Janey Joseph	F
28		Information Assistant	Fernelle Neptune	F
		Corporate Planning Officer	Edith Emmanuel	F
29	**Department of Sustainable Development**	Acting Permanent Secretary	Debra Charlery	F
30		Acting Deputy Permanent Secretary	Caroline Eugene	F
31		Legal Officer	Kate Wilson	F
32		Chief Sustainable Development & Environment Officer	Annette Rattigan-Leo	F
33		Deputy Chief Sustainable Development & Environment Officer	Dawn Pierre-Nathoniel	F
34		SDE Officer	Yasmin Jude	F
35		SDE Officer	Shanna Emmanuel	F
36		Office Assistant	Cleopatra Anthony	F
37		Communications Officer (DVRP)	Lucius Doxerie	M
38		Administrative Officer (DVRP)	Marcia Sharon Charles	F
39		SDE Officer	Jannel Gabriel	F
40		SDE Officer	Maier Sifflet	F

#	MINISTRY	DESIGNATION	NAME	GENDER
41		Environment Technician	Jurina Constantine	F
42		DPS' Secretary	Merrill John DuBoulay	F
43		Professional Cadet	Snaliah Mahal	F
44		Project Assistant	Angela St. Denis	F
45		Science & Technology Officer	Danielle Gordon	F
46		Project Manager, Protected Areas Management	Augustine Dominique	M
	MINISTRY OF ECONOMIC DEVELOPMENT, HOUSING, URBAN RENEWAL, TRANSPORT AND CIVIL AVIATION			
47	**Department of Economic Development, Transport and Civil Aviation**	Permanent Secretary	Philip Dalsou	M
48		Chief Economist	Nadia Hyacinth	F
49		Economist	Charlin Louisy	F
50	**Department of Housing, Urban Renewal and Telecommunications**	Chief Housing Planner	Jenny Daniel	F
	MINISTRY OF EQUITY, SOCIAL JUSTICE, EMPOWERMENT, YOUTH DEVELOPMENT, SPORTS, CULTURE AND LOCAL GOVERNMENT			
51	**Department of Local Government and Culture**	Minister	Senator the Hon. Fortuna Belrose	F
52		Deputy Permanent Secretary	Dawn French	F
53	**Department of Youth Development and Sports**	Director of Sports	Patrick Mathurin	M
	MINISTRY OF HEALTH AND WELLNESS			
54	**Department of Health**	Minister	Senator the Hon. Mary Isaac	F
55		Deputy Permanent Secretary	Verena Calderon	F

#	MINISTRY	DESIGNATION	NAME	GENDER
56		Social Planning Officer	Jackie Joseph	F
57		Environmental Health Officer III	Cheryl St. Romain	F
	MINISTRY OF HOME AFFAIRS, JUSTICE AND NATIONAL SECURITY			
58	**Department of Home Affairs and National Security**	Minister	Senator the Hon. Hermangild Francis	M
59		Financial Analyst	Mary Louison	F
60	**MINISTRY OF INFRASTRUCTURE, PORTS, ENERGY AND LABOUR**			
61	**Department of Infrastructure, Ports and Energy**	Permanent Secretary	Ivor Daniel	M
62		Superintendent of Works	Aldean Louis-Fernand	M
63	**Department of Labour**	Labour Commissioner	Ray Narcisse	F
64		Deputy Labour Commissioner	Cornelia Jn. Baptiste	M
65		Assistant Labour Commissioner	George Melchoir	M
66	Water and Sewerage Company Ltd. (WASCO)	Strategic Planning Manager	Peter Norville	M
67	Saint Lucia Air & Sea Ports Authority	Director of Maritime Affairs	Christopher Alexander	M
68	Organisation of Eastern Caribbean States (OECS)	Communications Officer	Phillip Cupid	M
69	US State Department	Project Manager	Lauren Oschman	F
70	Embassy of the United States of America to Barbados, the Eastern Caribbean and the OECS	Political-Economic Officer	Sarah Gjorgjijevski	F
71	UNDP, Barbados and the OECS	Operations Manager	Henry Mangal	M

#	MINISTRY	DESIGNATION	NAME	GENDER
72	Japan-Caribbean Climate Change Partnership/United Nations Development Programme (JCCCP - UNDP)	Technical Specialist	Neisha Manickchand	F
73		National Focal Point	Kurt Prospere	M
74	International Institute for Sustainable Development (IISD)	Director	Anne Hammill	F
75		Senior Researcher	Alec Crawford	M

ANNEX 3. SAINT LUCIA CLIMATE CHANGE ADAPTATION POLICY (2015)

The Saint Lucia Climate Change Adaptation Policy (CCAP) of 2015, outlines the general strategy for understanding and addressing the risks posed by climate change. It seeks to "ensure that Saint Lucia and its people, their livelihoods, social systems, and environment are resilient to the risks and impacts of climate change." The Policy endorses the principles of a cross sectoral approach to climate adaptation and concretely addresses: 1) adaptation facilitation- (appropriate policy, legislative and institutional environment); 2) adaptation financing (measures to ensure adequate and predictable financial flows) and, 3) adaptation implementation (concrete actions to prepare for, or respond to, the impacts of climate change).

The CCAP's execution will encompass activities geared towards building the resilience of households, communities, vulnerable groups, enterprises, sectors and ultimately, the nation, with efforts directed towards achieving the following objectives by 2022: a) Priority adaptation measures to the adverse effects of climate change developed and implemented at all levels; b) Identification of vulnerable priority areas and sectors and appropriate adaptation measures using available and appropriate information, recognising that such information may be incomplete; c) Adaptation measures in vulnerable priority areas supported by existing data sets and traditional knowledge, or new data developed as necessary; and d) Appropriate adaptation measures integrated into national and sectoral development strategies and linked as far as national circumstances will allow, to the national budgeting process.

In terms of facilitation, the CCAP proposes actions related to strengthen inter-agency and inter-sectoral collaboration, for example, identifying a suitable mechanism for strengthening the nexus between climate change adaptation and disaster risk reduction and formalising the relationship between the NCCC and other coordinating bodies, as appropriate.

Among the actions that the CCAP outlines for implementation, is the development of NAPs. Importantly, the CCAP puts specific focus on:

- Protecting freshwater resources, promoting watershed management and implement rainwater harvesting and storage;
- Establishing integrated coastal management and adaptation measures to increase the resilience of coastal systems, communities, critical infrastructure, and economic activities;
- Protecting human health from climate change- related diseases;
- Diversifying economic opportunities in agriculture and fishing, biodiversity conservation and management;
- Formulating appropriate building and zoning codes and promoting integrated early warning and response systems; and
- Promoting strategic partnerships between the public sector, private sector and civil society in the implementation of adaptation measures.

Importantly, while focused on addressing climate change adaptation, the CCAP recognises that some mitigation activities provide meaningful adaptation co-benefits and increase resilience.

ANNEX 4. NATIONAL CLIMATE CHANGE COMMITTEE (NCCC) MEMBERSHIP

Organisation *	Key Department, Division, Section, Unit Engaged from Organisation
Ministry with responsibility for Sustainable Development	• Sustainable Development and Environment Division** (Secretariat) • Renewable Energy Division*** • Protected Areas Management
Ministry with responsibility for Agriculture	• Agriculture • Fisheries • Forestry • Water
Ministry with responsibility for Physical Planning	• Physical Planning • Surveys and Mapping • Architecture
Ministry with responsibility for Health	• Environmental Health Division • Engineering
Ministry for Education	• Sir Arthur Lewis Community College • Gender Relations • Corporate planning/Curriculum
Ministry with responsibility for Tourism	-
Ministry with responsibility for Finance	-
Office of the Prime Minister	• National Emergency Management Organisation
Ministry with responsibility for Infrastructure	• Meteorological Services Department • Public Utilities Division • Engineering
National Insurance Council of Saint Lucia	-
Saint Lucia Bankers Association	-
National Conservation Authority	-
Saint Lucia Electricity Services Limited	-
Saint Lucia Solid Waste Management Authority	-
Saint Lucia Air and Sea Ports Authority	-
Water and Sewerage Company	-

* Nomenclature of Ministries have changed over the years.

** Includes staff directly from the Climate Change team, but also, as needed, from Coastal Zone Management, Chemicals, Biodiversity and Small Island Development States (SIDS) Development agenda.

***Recently moved to Ministry with responsibility for Infrastructure.