

Saint Lucia's Portfolio of Project Concept Notes for the Agriculture Sector 2018-2028

Under the National
Adaptation Planning Process



United States In-Country National Adaptation Plan (NAP) Support Program

Gift of the United States Government



Implemented by:



Initial funding for the Network also provided by:





Saint Lucia's Portfolio of Project Concept Notes for the Agriculture Sector 2018-2028 under the National Adaptation Planning Process

Prepared under the guidance of:

Department of Sustainable Development; and,
Department of Agriculture, Fisheries, Natural Resources and Cooperatives

With the support of:

Government of the United States, through the U.S. In-Country NAP Support Program, implemented via the International Institute for Sustainable Development (IISD). The opinions, findings and conclusions stated herein are those of the author[s] and do not necessarily reflect those of the United States Department of State.

Suggested citation: Government of Saint Lucia. (2018). Saint Lucia's Portfolio of Project Concept Notes for the Agriculture Sector 2018-2028, under the National Adaptation Planning Process. Department of Sustainable Development, Ministry of Education, Innovation, Gender Relations and Sustainable Development and Department of Agriculture, Fisheries, Natural Resources and Cooperatives, Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Cooperatives.

Photo credit: Lucius Doxerie

Saint Lucia National Adaptation Plan logo by Alexandra Grant.

©Government of Saint Lucia, 2018



United States In-Country National Adaptation Plan (NAP) Support Program

Gift of the United States Government



Implemented by:



Initial funding for the Network also provided by:



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.

The Sectoral Adaptation Strategy and Action Plan for the Agriculture Sector 2018–2028

(Agriculture SASAP)



Saint Lucia's agriculture sectoral adaptation strategy and action plan (SASAP) seeks to overcome policy, regulatory, institutional, technical, financial, business and social barriers to facilitate the adoption and scaling up of climate-resilient agriculture best practices and businesses for enhancing food and nutrition security in Saint Lucia under a changing climate.

Climate change threatens Saint Lucia's agriculture 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. Shifts in crop suitability of agricultural land and increased incidence of pests, weeds and disease, along with water stress and increased soil erosion, are also expected to increasingly affect the sector in the coming decades.

The cost of inaction on climate change in Saint Lucia has been calculated to be 12.1 per cent of GDP by 2025, rising to 24.5 per cent by 2050 and 49.1 per cent by 2100.¹

STRATEGY

This SASAP consists of **a set of measures**, considered essential for adaptation and prioritized by stakeholders in the sector. The SASAP determines for each measure whether its **implementation** should start in the **short term (2018 to 2021)**, **medium term (2021 to 2024)** or **long term (2024 to 2028)**, according to the measure's level of **urgency** and as funding becomes available, with short term being the most urgent.

The SASAP measures were formulated to:

1. Improve the national legal, regulatory and institutional framework.
2. Strengthen research and development in climate-resilient agriculture.
3. Enhance human and institutional capacity for the design, implementation, monitoring and evaluation of agriculture-related climate adaptation projects.
4. Promote climate-resilient crop and livestock production.
5. Strengthen resilience of ecosystem services through integrated land and watershed management.
6. Improve rainwater harvesting and water-storage infrastructure.
7. Improve water and soil conservation best practices.
8. Promote climate resilience through sustainable wastewater management by reducing, reusing and recycling agro-waste resources.
9. Forge a strong public-private partnership to scale up climate-resilient agriculture best practices and business.
10. Leverage private sector resources by improving access to resilient financial and business support and best practices for scaling up crop and livestock production.
11. Improve agro-meteorological data monitoring, emergency planning and informed decision making.
12. Minimize agriculture-related climate change risks by adopting ecosystem-based adaptation solutions.
13. Scale up climate-resilient agricultural infrastructure to reduce climate impacts.

¹ Bueno, R., Herzfeld, C., Stanton, E.A., Ackerman, F. (2008). *The Caribbean and Climate Change: The Costs of Inaction*. Medford, Massachusetts: Stockholm Environment Institute – US Center, Global Development and Environment Institute, Tufts University.

IMPLEMENTATION AND FUNDING

Execution of the SASAP's measures within a ten-year time frame are expected to occur mostly as a consequence of their inclusion in projects and programs funded from both national and international sources. However, adaptation is also expected to become immersed over time in all-new development projects in the sector. **To support fundraising efforts**, the SASAP is complemented by a series of **project concept notes**.

AGRICULTURE IN SAINT LUCIA

Agriculture provides about 15 per cent of the country's employment² and contributes 3 per cent of the GDP.³ Damage caused by extreme weather events, pests and diseases have contributed to abandonment of farms and farming livelihoods and to the economic decline of the sector in recent decades. Hurricane Tomas alone, in 2010, caused agricultural losses and damages of around XCD 151.8 million,⁴ from which the sector has not yet fully recovered. Banana production occupies 48 per cent of the cultivated land and accounts for 41.4 per cent of gross agricultural output.⁵ Other tropical fruits, coconut, cocoa, vegetables and herbs, tree crops, and cut flowers are also cultivated. The livestock sector is small and dominated by the poultry and pork subsectors.

EXPECTED OUTCOMES

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.
4. Built adaptive capacity to climate variability and extremes in the agricultural sector.

CHALLENGES TO THE DEVELOPMENT OF THE AGRICULTURE SECTOR UNDER A CHANGING CLIMATE

- Widespread livestock losses, crop damage and destruction during extreme weather events.
- Changes in the crop suitability of existing agricultural areas.
- Higher water and heat stress resulting in losses and increased water demand for irrigation.
- Siltation and contamination of river systems due to increased soil erosion and leaching of agrochemicals into water sources during heavy rainfall events.
- Salinization of coastal rivers and riverine areas due to sea-level rise and storm surge.
- Loss of soil nutrients and fertility from erosion and leaching, increasing the need for agrochemical use.
- Loss of agricultural land with flooding in low-lying areas and landslides in slopes.
- Changes in crop flowering and fruiting periods.
- Decreased reliability of traditional planting and harvesting schedules.
- More frequent pest and disease outbreaks (including new pest outbreaks).
- Reduced quality of pastures.
- Reduced livestock fertility and reproductive rates.
- Predisposition to, and increase in, livestock disease.
- Late maturation of livestock offspring and increase in calf mortality.
- Decline in the quality of crop and livestock products.
- Increased production costs.
- Decreased farm labour productivity with higher temperatures.
- Decreased nutrition and food security.

² World Bank (2017). Development Indicators for Saint Lucia. [ONLINE RESOURCE] Available at: <http://api.worldbank.org/v2/en/country/LCA?downloadformat=excel> (Accessed in March 2017).

³ GoSL (2016). Review of the Economy 2015. Ministry of Finance, Economic Affairs, Planning and Social Security.

⁴ Around USD 56.2 million in 2010.

⁵ Government of Saint Lucia. (2014). *Stocktaking Report. Report prepared in the framework of Saint Lucia's Third National Communication to the UNFCCC*. Department of Sustainable Development, Ministry of Sustainable Development, Energy, Science and Technology.



United States In-Country National Adaptation Plan (NAP) Support Program

Gift of the United States Government



Implemented by:



Initial funding for the Network also provided by:



CONTENTS

1. SUMMARY OF CONCEPT NOTES FOR CLIMATE CHANGE ADAPTATION PROJECTS IN SAINT LUCIA'S AGRICULTURE SECTOR	2
2. CONCEPT NOTES	6
Project concept 1. Production and marketing of alternative and biological pesticides for the scaling up of climate resilient agriculture in Saint Lucia	7
Project concept 2. Strengthening the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.	10
Project concept 3. Climate Resilient Agriculture Demonstration Centre (GRADE): Enabling the transformation of vulnerable groups in 3 subsistence farming communities into competitive national agri-business leaders under a changing climate	13
Project concept 4. Alternative water solutions for building climate resilience in vulnerable groups dependent on rainfed farming	16
Project concept 5. Public sensitisation towards improving the management, conservation and protection of water resources under a changing climate	18
Project concept 6. Building climate resilience in Saint Lucia through the documentation of effective indigenous practices for replication and scale-up, with a focus on sustainable land management, seed storage, pest and disease management	20
Project concept 7. Climate Resilient Agriculture (CRA) Demonstration Farms: Key means to disseminate information for promoting and expanding effective and simple farming solutions to climate-induced challenges	22
Project concept 8. Establishment of the Beausejour Agriculture Station as national centre of excellence for climate resilient livestock production	25
Project concept 9. Undertaking key policy and regulation updates to enable climate change adaptation planning in the agriculture sector.....	28
Project concept 10. Improving climate services in Saint Lucia through the development of a free agro-met mobile app for the country's farming community	30
Project concept 11. Agricultural diversification and agro-processing for increasing climate resilience in vulnerable farming communities.....	32

1. SUMMARY OF CONCEPT NOTES FOR CLIMATE CHANGE ADAPTATION PROJECTS IN SAINT LUCIA'S AGRICULTURE SECTOR

The Government of Saint Lucia has formulated a National Adaptation Plan, NAP (2018-2028) and Sectoral Adaptation Strategies and Action plans (SASAPs) to ensure that effective steps are taken, in a coordinated and timely manner, to address the challenges posed by climate change and minimise, to the extent possible, damages and losses which could exceed 24.5% of GDP by 2050 and 49.1% by 2100, if no action is taken.

The NAP and SASAPs detail adaptation objectives and priority measures; propose activities and timing for the execution of the measures and offer project concept notes for resource mobilisation and implementation. This document summarises the **project concept notes prepared under the lead of the Department of Agriculture** for Saint Lucia's Agriculture SASAP. By allowing the implementation of the measures in the SASAP, the projects proposed will contribute to building national capacities for adaptation planning and integration, while accelerating the implementation of climate adaptation and risk reduction actions that are critical to safeguarding the country's socioeconomic and environmental systems under a changing climate.

The project concept extracts listed here are a reflection of the measures and project concept notes contained in Saint Lucia's NAP and Agriculture SASAP, They are not listed in order of priority. Given that these documents are living or organic, it is envisaged that additional project concept notes will be added over time.

While **the lead agency for Saint Lucia's Sectoral Adaptation Strategy and Action Plan for the Agriculture Sector (Agriculture SASAP) 2018-2028 is the Department of Agriculture**, the implementation of projects and programmes would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted.

No	Title	Summary	Indicative Beneficiaries	Indicative Cost	Private sector involvement	Duration
1	Production and marketing of alternative and biological pesticides for the scaling up of climate resilient agriculture in Saint Lucia	This project seeks to produce native entomopathogenic fungi which can serve as biological insecticides to increase the capacity of farmers to protect their agro-ecosystem and businesses from local and invasive exotic insect outbreaks through the development of reliable, competitive and natural pesticides.	Farmers	USD 250,000	yes	3 years

* Projects with mitigation co-benefits

No	Title	Summary	Indicative Beneficiaries	Indicative Cost	Private sector involvement	Duration
2	Strengthening the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.	The programme is proposed as a series of 5 day-training modules, tailored for the local context and involving the active participation of extension workers and the farming communities they work with to strengthen the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adapt to climate change and promote Climate Resilient Agriculture (CRA) businesses.	Extension officers and farmers	USD 250,000	yes	2 years
3	* Climate Resilient Agriculture Demonstration Centre (CRADE): Enabling the transformation of vulnerable groups in 3 subsistence farming communities into competitive national agri-business leaders under a changing climate	The programme will initiate a Climate Resilient Agricultural Demonstration Centre (CRADE) through which value chains will be created and strengthened, and research, courses, field demonstrations and knowledge products developed to boost the capacities of local actors in undertaking climate resilient agriculture farming and business. A crop insurance incentive scheme will also be created. As such, the programme sets the basis for diversifying livelihoods and creating climate-resilient businesses and jobs for vulnerable groups.	Farmers and other value chain actors	USD 1,000,000	N/A	5 years
4	Alternative water solutions for building climate resilience in vulnerable groups dependent on rainfed farming	This programme seeks to enhance the capacity of rainfed agriculture-based communities to prepare for water-related stress, induced by increasing drought and heatwave events. The programme interventions encompass a whole series of activities for increasing the availability and more efficient use of water for rainfed farming households and operations (including technical assistance and training).	Farmers and households	USD 1,000,000	N/A	5 years

* Projects with mitigation co-benefits

No	Title	Summary	Indicative Beneficiaries	Indicative Cost	Private sector involvement	Duration
5	Public sensitisation towards improving the management, conservation and protection of water resources under a changing climate	This project focuses on exposing Saint Lucians to sustainable land use and water conservation practices and encouraging adoption, in order to reduce river sedimentation and to better manage water supplies during periods of water scarcity (through public campaigns and activities).	The entire Saint Lucian population	USD 120,000	yes	3 years
6	Building climate resilience in Saint Lucia through the documentation of effective indigenous practices for replication and scale-up, with a focus on sustainable land management, seed storage, pest and disease management	This project seeks to identify and assess the effectiveness of local and traditional soil and water conservation practices applied in some areas of the Dennery Mabouya valley, an area inhabited by many small-scale farmers and where cultivation often takes place over the surrounding steep slopes. This initiative is proposed as the first of a series of projects to document and map local effective strategies to respond to environmental and climate change in Saint Lucia.	Farming community (hillside farmers); Extension officers, NGOs, Schools and	USD 60,000	yes	2 years
7	Climate Resilient Agriculture (CRA) Demonstration Farms: Key means to disseminate information for promoting and expanding effective and simple farming solutions to climate-induced challenges	This project proposes to establish a series of CRA demonstration farms to promote improved technologies. The project also includes a series of actions to communicate existing and generate new field-level CRA knowledge in Saint Lucia; allowing the identification and testing of best practices as well as hands-on training for their replication.	Research and Development officers and farmers	USD 1,500,000	N/A	5 years

No	Title	Summary	Indicative Beneficiaries	Indicative Cost	Private sector involvement	Duration
8	Establishment of the Beausejour Agriculture Station as National Centre of Excellence for Climate Resilient Livestock Production	This project seeks to turn the Beausejour Agriculture Station into a National Centre of Excellence for Climate Resilient Livestock Production. The Centre will enable research for the application of existing and generation of new CRA best practices to strengthen livestock production in Saint Lucia and support national livestock systems to better withstand climate shocks, while reducing greenhouse emissions.	Livestock farmers, other livestock value chain actors, extension officers	USD 2,000,000	N/A	3 years
9	Undertaking key policy and regulation updates to enable climate change adaptation planning in the agriculture sector	This project proposes to conduct all the necessary background studies for including SLR, salinity intrusion, and land use considerations into the Draft Agriculture Policy and Strategy and for enabling the development and implementation of land use planning and zoning regulations, essential for national development and adaptation.	All Saint Lucians	USD 800,000	yes	4 years
10	Improving climate services in Saint Lucia through the development of a free agro-met mobile app for the country's farming community	This project proposes the design and implementation of a mobile data app, to strengthen Saint Lucian farmers' ability to respond, in a timely manner, to extreme weather events, thus reducing losses, and facilitate ease of planning farm activities using up-to-date weather forecasts.	All farmers in Saint Lucia	USD 300,000	yes	2 years
11	Agricultural diversification and agro-processing for increasing climate resilience in vulnerable farming communities	This project proposes the diversification of food crop cultivation and use and the establishment of sustainable agro businesses in select communities, vulnerable to climate variability and change and currently suffering from high levels of youth unemployment. The project focuses on the establishment of a public-private investment venture for agro-processing Saint Lucian aromatic herbs and native fruits. Young farmers will participate as shareholders in this venture.	Youth from selected communities and other vulnerable groups.	USD 150,000	yes	2 years

* Projects with mitigation co-benefits

2. CONCEPT NOTES

The project concept notes outlined here are a reflection of the measures contained in Saint Lucia's NAP and Agriculture SASAP. They are not presented in order of priority. Given that these documents are living or organic, it is envisaged that additional project concept notes will be added over time.

While the lead agency for *Saint Lucia's Sectoral Adaptation Strategy and Action Plan for the Agriculture Sector (Agriculture SASAP) 2018-2028*, is the Department of Agriculture, the implementation of projects and programmes would require the involvement of multiple agencies and stakeholders. In some cases, collaboration with other lead agencies would be warranted.

PROJECT CONCEPT 1. PRODUCTION AND MARKETING OF ALTERNATIVE AND BIOLOGICAL PESTICIDES FOR THE SCALING UP OF CLIMATE RESILIENT AGRICULTURE IN SAINT LUCIA

CONCEPT NOTE 1

Project title **Production and marketing of alternative and biological pesticides for the scaling up of climate resilient agriculture in Saint Lucia**

Objective(s) To increase the capacity of farmers to protect their agro-ecosystem and businesses from local and exotic insect outbreaks through the development of reliable, competitive and natural pesticides.

Specific objectives:

- Study and preserve the population of entomopathogenic fungi found living in Saint Lucia
- Refine protocols for the production of biological pesticides using these organisms
- Set up a public, private company for the production and marketing of these insecticides
- Increase the benefits of farm agro-biodiversity
- Raise public awareness about the hazards of pesticides

Rationale

Agriculture is an important traditional productive sector in Saint Lucia. It provides 21% of total employment and is dominated by small-scale (less than 3 acres) rain-fed farming operations. However, in recent decades, agriculture has been increasingly affected by climate variability, extreme weather events and pests and disease outbreaks. The damages caused by these events, together with land use change for urban and tourism development and other factors, have led to the abandonment of farming areas and an overall decline in agricultural production and productivity. The Government of Saint Lucia (GoSL) recognises the importance of its agriculture sector and the need for urgent actions to reinvigorate it for reducing the net national food import bill and ensuring long-term food security. The GoSL also recognises that efforts towards increasing agricultural production must take place while protecting agriculture from the impacts of climate change to which it is directly exposed. Most frequent pest and disease outbreaks, resulting from the changing climate conditions is one major climate change impact already affecting farming livelihoods and businesses in Saint Lucia.

Higher temperatures and unseasonal precipitation in the present decade have made farming conditions more difficult in the Caribbean region and led to the observed increase in insect populations and vector borne plant diseases. These are controlled with agrochemicals by the local farming and domestic communities. Unfortunately, these chemicals contaminate the environment and food supplies and are damaging to the health of farm workers. Of further concern is that the insects rapidly adapt to them, which leads to an increasing amount of chemicals being used. An alternative to this health and environmental damaging cycle is the development of natural biological pest control systems.

A team of crop protection officers from the Research and Development Division of the Government agency with responsibility for Agriculture performed a detailed study of the Asian Psyllid (a pest of citrus crop) population and their biological controls during 2012. An interesting group of entomopathogenic fungi

CONCEPT NOTE 1

Project title **Production and marketing of alternative and biological pesticides for the scaling up of climate resilient agriculture in Saint Lucia**

were discovered to be infecting and controlling the psyllids. A field study was performed to identify sites where these fungi were prevalent. Four such sites were located and the coordinates of these were used to prepare a digital map. The sites were surveyed monthly and the best collection times in the wild were identified. The infected insects were taken into the lab where detailed protocols for the fungal isolation, multiplication, production and conversion into pesticides were developed. Two of the fungi produced were then used to infect a wide variety of agricultural pests including white flies, mites, aphids, scales and caterpillars.

This project seeks to produce native entomopathogenic fungi which can serve as biological insecticides. These fungi have been shown to control numerous species globally, and in many countries, have led to a reduction in the usage of conventional agro chemicals, and thus to reduced soil, food and water pollution and to healthier conditions for farm workers.

A major difference with chemical pesticides is that the entomopathogenic fungi have evolved with the insects and possess the ability to adapt to the changing genetic makeup of their hosts; therefore, this natural pest control system does not become obsolete.

The country's dependence on imported agrochemicals not only places a dent on the country's finances, but is also a source of domestic insufficiency. The country will be unable to sustain its agricultural sector, in the face of climate change and its accompanying impacts without the local production of inputs for the sector using local resources. The use of native entomopathogenic fungi to control insect pests proposed here will help reduce the cost of production of agricultural produce, since in many cases, they only require one application for the life of a crop, thereby helping make the local farming sector more competitive.

The project will also raise public awareness of the hazards of chemical pesticides and make it easier to control pests organically and provide a needed tool to the organic, backyard, natural and green farming communities. In addition, it will provide the Saint Lucian farming community and the GoSL with the capacity to better manage the influx of exotic insect pest species that have already reached the island with the changing climate conditions.

Beneficiaries Farmers from Saint Lucia

Activities and Tasks

Study and production of native entomopathogenic fungi species in Saint Lucia for the production of biological insecticides

Main outputs/products

- Protocols and criteria to identify, select, map out and produce native entomopathogenic fungi species developed, tested, endorsed and upgraded
- Native entomopathogenic fungi species identified, screened, targeted and their efficacy evaluated and multiplied at selected Research Stations
- Promising native entomopathogenic fungi species tested and endorsed on selected farmer fields

CONCEPT NOTE 1

Project title **Production and marketing of alternative and biological pesticides for the scaling up of climate resilient agriculture in Saint Lucia**

across geographical zones

- Proven native entomopathogenic fungi species propagated, multiplied, improved and branded for sale to farmers
- Knowledge and communication products and services on proven native entomopathogenic fungi species developed and endorsed for the training and awareness raising of value chain actors
- Awareness raising campaign on the hazards of chemical pesticides

Implementation

Potential partners: Agri Enterprise (lead), Research, Extension and Forestry, Caribbean Agricultural Research and Development Institute (CARDI), Inter-American Institute for Cooperation on Agriculture (IICA).

Responsible agency/partners: Government agency with responsibility for Agriculture, CARDI.

Indicative cost: USD 500,000

Duration: 3 years

Additional information: This project is aligned with adaptation measure 8 in the Agriculture SASAP and can contribute to implementing measures 13,19 and 45

PROJECT CONCEPT 2. STRENGTHENING THE CAPACITY OF THE AGRICULTURE EXTENSION OFFICERS TO PROVIDE TIMELY AND RELIABLE SUPPORT FOR FARMERS TO ADOPT AND SCALE UP CLIMATE RESILIENT AGRICULTURE (CRA) BUSINESSES.

CONCEPT NOTE 2	
Project title	Strengthening the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.
Objective(s)	To strengthen the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.
Rationale	<p>Climate Resilient Agriculture (CRA) is an adaptation approach that seeks to improve the capacity of farming systems to withstand climate shocks and stresses while maintaining production, yields and profitability. The CRA approach is based on the application of best agricultural management practices that, over time and in different contexts, have evolved as simple and effective responses to experienced local climate and farming challenges. CRA also covers the application of farming inputs developed and tested to address local needs such as improved seeds, pest control inputs and irrigation. CRA promotes knowledge sharing and collective action for building resilience at the community level. It uses training and demonstration sites to develop the capacity of farmers in the application of best practices, which include, among others, those for soil organic carbon build up, in-situ moisture conservation, water harvesting and recycling for supplemental irrigation, water saving technologies, growing drought and flood tolerant varieties and improved livestock feed and feeding methods.</p> <p>Lack of access to reliable and up-to date information and training on climate-resilient agriculture, including CRA best practices and business models, hampers the effectiveness of the extension officers of the Government agency with responsibility for Agriculture to provide timely and efficient products and services for farmers to plan and implement climate adaptation actions at their farms.</p> <p>The development of a long-term capacity development programme for extension officers is needed and proposed here to enhance their skills and knowledge on CRA and better support farmers in the adoption and scaling up of CRA best practices and businesses. The programme is proposed as a series of 5 day-training modules, tailored for the local context and involving the active participation of extension workers and the farming communities they work with and which will also be direct beneficiaries of this project. The modules will be delivered in various opportunities during the year, to cover all the extension workers.</p> <p>The syllabus of the long-term capacity building programme will be based on the Climate Smart Agriculture course offered by the Centre for Sustainable Development in Canada (http://www.csd-i.org). The Programme would cover training modules involving both CRA best-practice and business theory and field practice courses, to be complemented with downloadable manuals and field guides for each technique introduced.</p> <p>The training courses would take a participatory approach, with extension officers first collaborating</p>

CONCEPT NOTE 2

Project title **Strengthening the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.**

with the community members with whom they work in the development of a participatory mapping of crop systems, soil and water resources; and then, in consultation with, and guided by, the expert(s) in soil, water and agriculture, the extension workers would develop a participatory training process for a Climate Resilient Agricultural Programme specific to the context of the communities with whom they work.

The following are proposed 5 days training modules:

1. Participatory Mapping of Local Context: Conduct surveys and interviews to collect traditional knowledge on agriculture, changes in agricultural cycles, vulnerabilities and coping strategies. Facilitate the organisation of a community-based Farmer Association. Identify expert specialist/extension agents in soil, water and agriculture to design and facilitate participatory capacity building workshops.
2. Community workshop on participatory mapping of cropping systems, and soil and water resources, uses, challenges and ecosystem services: Identify important soil and water resources and challenges. Prioritise degraded farmlands and resources for protection/restoration based on the mapping exercise. Strengthen community knowledge on adaptation to climate change.
3. Survey of Solution-Oriented Adaptation Techniques: Low input agricultural technologies. Conservation Agriculture.
4. Water conservation techniques: Including: a) mulching for reducing evaporative water loss and increasing organic material in the soil; b) Improving the organic matter of soils; c) Contour levelling: level planting rows across hillside; d) Runoff agriculture: stone and soil bunds to control runoff, increase soil moisture and reduce soil erosion; depressions for runoff capture and infiltration planting grass strips, trees, and hedgerows across the contour to reduce runoff velocity, improve water infiltration, and trap sediment.
5. Coping with unpredictable weather patterns: Buffering against extended dry spells, the late arrival of rain and/or an early end to the rainy season, and from strong tropical rains. Changing cropping cycle and crop mix. Multiple and rotational cropping. Crop diversification. Early maturing. Drought resistant crop varieties.
6. Evaluation of participatory mapping: Evaluate results of participatory mapping of agricultural resources and select appropriate, improved agricultural practices. Propose appropriate techniques to the Farmer Association for feedback.
7. Community Workshop Planning: Prioritise the soil/water conservation/restoration techniques that should be introduced in the first workshop. Contact, if further required, an agricultural extension expert for feedback and input. Develop a workshop lesson plan. Draw a how-to card. Arrange the date and location for the workshop with the community contact person. Arrange for supplies and tools for the workshop with the community contact person.
8. Capacity Building: Organise presentation materials. Arrange for colleagues in facilitating the workshop. Facilitate the capacity building workshop at the demonstration plots.

Beneficiaries Extension officers and farmers

CONCEPT NOTE 2

Project title **Strengthening the capacity of the agriculture extension officers to provide timely and reliable support for farmers to adopt and scale up Climate Resilient Agriculture (CRA) businesses.**

Activities and Tasks

Rescue the capacity (policy, institutional, technical, financial, business and social knowledge and skills) of the existing and new extension officers enhanced to support farmers and value chain actors to scale up CRA best practices and businesses.

Main outputs/products

- Needs and gaps analyses conducted to assess the baseline capacity of the existing and new extension officers
- Based on international, regional and national best practices and lessons learned, gender responsive and easy to use knowledge materials (leaflets, training manual, guidebooks, toolkits, business models) and communication products (leaflets, TV/radio materials, social media), services and platforms on CRA best practices developed, tested, and approved
- Training and awareness raising programmes (e.g. study tours, site visits) planned, organised, conducted and improved to train and raise awareness among value chain actors
- Impact of the capacity development programme monitored and evaluated on a bi-annual basis.

Implementation

Responsible agency/partners: Government agency with responsibility for Agriculture, CARDI.

Cost estimate USD 250,000

Duration **2 years**

Additional information:

- This project is aligned with adaptation measures 19, 20 and 37 in the Agriculture SASAP and can contribute to implementing measures 27, 9, 10, 11, 12, 13, 17, 18, 22, 23, 24, 25, 26, 27, 30, 31, 32 41 and 45
- Climate Smart Agriculture course offered by the Centre for Sustainable Development in Canada, proposed as the basis for the development of this project is available at: <http://www.csd-i.org/ol-333-climate-smart-agricult/#SYLLABUS>

PROJECT CONCEPT 3. CLIMATE RESILIENT AGRICULTURE DEMONSTRATION CENTRE (CRADE): ENABLING THE TRANSFORMATION OF VULNERABLE GROUPS IN 3 SUBSISTENCE FARMING COMMUNITIES INTO COMPETITIVE NATIONAL AGRI-BUSINESS LEADERS UNDER A CHANGING CLIMATE

CONCEPT NOTE 3	
Project title	Climate Resilient Agriculture Demonstration Centre (CRADE): Enabling the transformation of vulnerable groups in 3 subsistence farming communities into competitive national agri-business leaders under a changing climate
Objective(s)	Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions and increased resilience of health and well-being, and food and water security, and strengthened adaptive capacity and reduced exposure to climate risks through the establishment of a Climate Resilient Agriculture Demonstration Centre (CRADE).
Rationale	<p>This programme aims to reduce the vulnerability and food insecurity of three small-scale farming communities threatened by climate variability and change in Saint Lucia. It will run over a period of 60 months and will consist of a series of activities for these communities to shift from a purely subsistence production model towards full national market penetration model. The programme will initiate a climate resilient agricultural demonstration centre (CRADE) through which value chains will be created and strengthened, and research, courses, field demonstrations and knowledge products developed to boost the capacities of local actors in undertaking climate resilient agriculture farming and business. A crop insurance incentive scheme will also be created. It is expected that as result of these two major interventions, the programme sets the basis for diversifying livelihoods and creating climate-resilient businesses and jobs for vulnerable groups, while building capacities for many other actors through demonstration of, and collaboration in, the programme activities.</p> <p>Through the CRADE, the programme will offer institutional, legal, financial, business and capacity building support for farmers to engage in/adopt, use and scale-up a series of Climate Resilient Agriculture (CRA) best-practices targeting the development of value chains. Among these, and of particular relevance are:</p> <ul style="list-style-type: none"> - Conservation agriculture and micro drip irrigation - Off-grid solar energy technologies (for water pumping for small-scale micro horticultural systems, and refrigeration for harvested food) <p>CRADE will also offer the facilities for research and development of CRA products, including organic agricultural inputs.</p>
Beneficiaries:	Farmers

CONCEPT NOTE 3

Project title **Climate Resilient Agriculture Demonstration Centre (CRADE): Enabling the transformation of vulnerable groups in 3 subsistence farming communities into competitive national agri-business leaders under a changing climate**

Activities and Tasks

- Establishment and operation of Saint Lucia Climate Resilient Agriculture Demonstration Centre (CRADE).
- Small-scale farmers adopting, promoting and expanding of CRA best practices and businesses
- Implementation of Farmers' crop insurance scheme
- Farmers and enterprises adopting, promoting and scaling up **off-grid solar energy technologies for reducing costs** and as part of CRA.
- Farmers adopting and promoting diversified livelihoods to improve income
- Enhanced capacity of value chain actors (public, private, business service providers, banks, academia, media and Civil Society Organisation (CSO) partners, consumers) to promote and scale up CRA best practices.

Main outputs/products

- Saint Lucia Climate Resilient Agriculture Demonstration Centre (CRADE) established and operational
- Field research, trial and demonstration sites set-up, research conducted and published; organic fertilisers produced
- Farmer and sites for CRA identified, surveyed, selected and approved
- CRA best practices (solar irrigation; organic farming; beekeeping; composting and organic fertiliser; natural pesticides; mulching, small ruminants) designed, developed, tested in the local context and endorsed
- Viable CRA businesses implemented, scaled up, monitored and evaluated
- Community Project Management Unit established and operational to manage and monitor the project
- Feasibility study on the needs, gaps, opportunities and challenges of crop insurance scheme conducted, analysed and published
- Crop Insurance Scheme developed, tested, improved and rolled out
- Solar technologies for farms and enterprises (e.g. solar irrigation, water pumping to reduce operation cost in greenhouse, hydroponic, aquaponic system) with viable financial and business models (e.g. start-up loan, matching rebate, lease to buy) identified, developed, tested and endorsed
- Solar-energy related businesses promoted and scaled up to implement CRA best practices
- Diversification and Alternative Sustainable Livelihoods Adaptation programmes identified, developed, promoted and scaled up
- Knowledge and communication products, services and platforms developed and tailored to vulnerable groups, to strengthen their capacity to adopt and scale up CRA.

CONCEPT NOTE 3

Project title **Climate Resilient Agriculture Demonstration Centre (CRADE): Enabling the transformation of vulnerable groups in 3 subsistence farming communities into competitive national agri-business leaders under a changing climate**

Implementation

Government agency with responsibility for Agriculture

Indicative Cost: USD 1,000,000

Duration: 5 years

Additional information:

This project is aligned with adaptation measures 18, 19, 20, and 33 in the Agriculture SASAP and can contribute to implementing measures 7, 8, 9 ,10, 11, 12, 13, 17, 21,23, 31, 36, 37, 38 and 45

This program offers mitigation co-benefits

PROJECT CONCEPT 4. ALTERNATIVE WATER SOLUTIONS FOR BUILDING CLIMATE RESILIENCE IN VULNERABLE GROUPS DEPENDENT ON RAINFED FARMING

CONCEPT NOTE 4	
Project title	Alternative water solutions for building climate resilience in vulnerable groups dependent on rainfed farming
Objective(s)	To increase the capacity of small-scale farmers to cope with drought and heatwaves while developing sustainable and climate resilient businesses.
<p>Rationale</p> <p>Saint Lucia’s Climate Change Adaptation Policy recognises the challenge of providing freshwater to the country’s populations and economic activities under a changing climate. Freshwater shortages have already started to be experienced and are expected to increase with time. This will be driven by an increasing demand brought by a growing population, while climate change induces lower annual precipitation and more erratic rainfall, higher evaporation, and saline intrusion into coastal rivers due to sea-level-rise.</p> <p>Agriculture is an important traditional productive sector in Saint Lucia. It provides 21% of total employment and is dominated by small-scale (less than 3 acres) rain-fed farming operations, which are the main source of livelihood for about 532,000 families (Graham, 2015). However, in recent decades, agriculture has been increasingly affected by climate variability, extreme weather events and pests and disease outbreaks. The damages caused by these events, together with land use change for urban and tourism development and other factors, have led to the abandonment of farming areas and an overall decline in agricultural production and yields.</p> <p>Rain-fed agriculture will possibly be the productive sector most affected by climate change in the country, as with climate change, lower annual precipitation, more erratic rainfall leading to longer dry periods and more intense drought and higher evaporation are projected. Freshwater shortages have already started to be experienced and are expected to increase with time, exacerbated by the increasing demand brought by a growing population. Considering these climate projections, the possible of loss of rural livelihoods is of major concern.</p> <p>This programme seeks to enhance the capacity of rainfed agriculture-based communities to prepare for water-related stress, induced by increasing drought and heatwave events. The programme interventions encompass a whole series of activities for increasing the availability and more efficient use of water for rainfed farming households and operations. These include reducing leaks in existing water storage and supply infrastructure, the installation of tube wells and deep tube wells, the introduction and construction of Rainwater Harvesting (RWH) technologies, improved surface water management, building necessary sanitary latrines, providing beneficiaries with stress tolerant crop varieties and management technologies and building skills, through training on income generating activities for vulnerable groups. Additionally, Farmer Schools will be established/strengthened for training farmers on climate-resilient crop and livestock production.</p>	
Beneficiaries Farmers and households	
<p>Activities and Tasks</p> <ul style="list-style-type: none"> Facilitate the access of small-scale farmers to a reliable supply of water (rain, grey and 	

CONCEPT NOTE 4

Project title **Alternative water solutions for building climate resilience in vulnerable groups dependent on rainfed farming**

ground water) to implement and scale up climate resilient agricultural practices and sustainable businesses

- Implement small-scale farmers' irrigation schemes tied to measures to increase the water use efficiency of crop and livestock production.
- Develop the capacity of value chain actors (suppliers, installers, farmers, end users) to scale up RWH and grey water harvesting technologies for agricultural production and businesses.

Main outputs/products

- Old, broken, damaged rainwater harvesting systems identified, surveyed, costed, renovated, improved, and operational
- Extension officers and water engineers trained and certified to identify and map new ground water reserve using Proton Magnetic Resonance (PMR) and means of access (e.g. exploratory wells dig in Vieux Fort, Micoud, Castries and Roseau all have yielded water at less than 6 feet of depth).
- New storm-proof rain, grey water and wastewater harvesting systems (swales along contours, gravity feed, storage tanks, geo-membrane ponds, network piping), designed, installed, tested and operational on targeted farms in vulnerable areas
- Business models to promote and expand RWH and grey water harvesting best practices and related enterprises developed, tested and promoted.
- Capacity of small scale farmers enhanced for the production of high quality crop and livestock through soil and water conservation technologies
- Farmers Field Schools established to demonstrate how to balance demand for water with efficient supply to produce high quality crops and livestock in small farms
- Baseline surveys of all targeted areas, value chain actors and beneficiaries conducted and endorsed
- Knowledge and communication products, services and platforms on efficient water supply and demand side management developed, tested, and approved
- Training and awareness raising programmes organised and conducted to train value chain actors in the design, installation, maintenance and improvement of RWH and grey water harvesting systems for agribusiness operations

Implementation: Government agency with responsibility for Agriculture

Cost estimate USD 1,000,000

Duration: 5 years

Additional information:

This project is aligned with adaptation measures 18, 20, 29, 30 and 31 in the Agriculture SASAP and can contribute to implementing measures 10, 19, 24, 37, 38 and 45. The project also contributes to the achievement of several strategic objectives of the Water SASAP.

PROJECT CONCEPT 5. PUBLIC SENSITISATION TOWARDS IMPROVING THE MANAGEMENT, CONSERVATION AND PROTECTION OF WATER RESOURCES UNDER A CHANGING CLIMATE

PROJECT CONCEPT 5	
Project title	Public sensitisation towards improving the management, conservation and protection of water resources under a changing climate
Objectives	<ul style="list-style-type: none"> • To increase public awareness of the role played by each individual in causing and solving water resource management problems. • To increase public participation in improving water resource management. • To jump-start the public education/sensitisation activities within the water sector and establish a product which would be able to draw corporate sponsorship.
Rationale	<p>Saint Lucia relies heavily on the abstraction of surface water to meet water consumption demands. However, poor land use and conservation practices have exacerbated soil erosion and increased the risk of landslides, which result in large sediment loads reaching the country's rivers, particularly during heavy rainfall events and tropical storms preceded by dry periods. This affects river water quality, reduces the capacity of freshwater reservoirs and ultimately, compromises water supply on the island. This situation could worsen in the future if no action to improve farming and other land-use practices is undertaken, as with climate change, Saint Lucia is expected to experience an overall reduction in annual precipitation, more frequent and intense dry spells and more intense and unpredictable rainfall events in the coming decades.</p> <p>In view of the above considerations, it is crucial to raise public awareness on the role that farmers and citizens in general play in securing the quality and provision of water in the future and to spark changes in the attitudes and unsustainable practices that currently compromise land and surface water resources. This project focuses on exposing Saint Lucians to sustainable land use and water conservation practices and encouraging to adopt them, in order to reduce river sedimentation and to better manage water supplies during periods of water scarcity.</p>
Proposed location/site(s):	Island-wide
Beneficiaries	The entire Saint Lucian population
Activities and Tasks	<ul style="list-style-type: none"> • Organise an annual exhibition during the week of World Water Day. • Conduct water-themed school competitions. • Design and conduct conservation activities (tree planting, river/wetland clean ups) • Conduct panel discussions
Main outputs/products	<ul style="list-style-type: none"> • Quarterly News Bulletin (electronic publication) highlighting local actions (success stories). • Informational video productions • Jingles and animated comic series

PROJECT CONCEPT 5

Project title **Public sensitisation towards improving the management, conservation and protection of water resources under a changing climate**

- Population behavioural change

Implementation:

Leading agency: Water Resources Management Agency

Financing: Government of Saint Lucia and development partners

Indicative cost: USD 120,000

Duration: 36 months

Additional information

- This project contributes to implementing measures 9, 19 and 20 in the Agriculture SASAP's
- The project is also aligned with and contributes to the implementation of Saint Lucia's Climate Change Communications Strategy (2018)
- This project is also of relevance for the Water SASAP and thus, this concept note is also included in it.

PROJECT CONCEPT 6. BUILDING CLIMATE RESILIENCE IN SAINT LUCIA THROUGH THE DOCUMENTATION OF EFFECTIVE INDIGENOUS PRACTICES FOR REPLICATION AND SCALE-UP, WITH A FOCUS ON SUSTAINABLE LAND MANAGEMENT, SEED STORAGE, PEST AND DISEASE MANAGEMENT

PROJECT CONCEPT 6	
Project title	Building climate resilience in Saint Lucia through the documentation of effective indigenous practices for replication and scale-up, with a focus on sustainable land management, seed storage, pest and disease management
Objectives	<ul style="list-style-type: none"> To identify and document soil and water conservation measures used in Dennery and Mabouya Valley. To assess the effectiveness of indigenous soil and water conservation measures under current and expected future climate conditions.
Rationale	<p>The Saint Lucia Climate Change Adaptation Policy (2015) calls for close attention to be paid to the traditional technologies and skills that have allowed the country’s communities to cope successfully with climate variability in the past and to combine these with modern knowledge and technologies, where appropriate. While there are several examples of indigenous adaptation and coping strategies in the country’s agricultural sector, these have not been rigorously documented or assessed, missing the opportunity of utilising the local knowledge in planning and implementing adaptation responses for the sector at the national level.</p> <p>This project seeks to identify and assess the effectiveness of local and traditional soil and water conservation practices applied in some areas of the Dennery Mabouya valley, an area inhabited by many small-scale farmers and where agriculture often takes place over the surrounding steep slopes. In this region, soil erosion has become a very serious problem, triggered by the recent shift in cultivation from bananas to cash crops not suitable for the local conditions. Documenting effective local strategies to address this problem is highly relevant now and not only for this area, but also for all agricultural regions in the country, as with climate change, more frequent and extended dry periods and more intense rainfall events are projected. These are expected to exacerbate land degradation processes and to reduce water availability for agriculture. This initiative is proposed as the first of a series of projects to document and map local effective strategies to respond to environmental and climate change in Saint Lucia.</p> <p>Proposed location/site(s): Pilot in the Dennery Mabouya valley area and application island-wide</p>
Beneficiaries	<ul style="list-style-type: none"> Farming community (hillside farmers) Extension officers, NGOs, schools and Government agency with responsibility for Agriculture
Activities and Tasks	<ul style="list-style-type: none"> Select sites for information collection Collect local information and farmers’ perspectives Collect socio-economic information

PROJECT CONCEPT 6

Project title **Building climate resilience in Saint Lucia through the documentation of effective indigenous practices for replication and scale-up, with a focus on sustainable land management, seed storage, pest and disease management**

- Document measures
- Establish database of traditional and effective land and water conservation measures
- Documentation of information

Main outputs/products

- Description of measures
- Identification of soil and water conservation measures
- Description of the environmental conditions where the measures have been applied
- Assessment of indigenous soil and water conservation measures

Implementation:

Leading agency: Government agency with responsibility for Agriculture (Extension Department)

Support: Engineering Department, Research Department

Financing: Government of Saint Lucia and development partners

Indicative cost: USD 60,000

Duration: 2 years

Additional information

- This project is aligned with measure 19 in the Agriculture SASAP and can contribute to implementing measure 7, 9, 11, 18, 20,22, 23 and 45
- This project is also of relevance for the Water SASAP and thus, this concept note is also included in it.

PROJECT CONCEPT 7. CLIMATE RESILIENT AGRICULTURE (CRA) DEMONSTRATION FARMS: KEY MEANS TO DISSEMINATE INFORMATION FOR PROMOTING AND EXPANDING EFFECTIVE AND SIMPLE FARMING SOLUTIONS TO CLIMATE-INDUCED CHALLENGES

CONCEPT NOTE 7	
Project title	Climate Resilient Agriculture (CRA) Demonstration Farms: Key means to disseminate information for promoting and expanding effective and simple farming solutions to climate-induced challenges
Objective(s)	To establish CRA demonstration farms for generating and disseminating simple, effective and no-regret solutions to climate-induced agricultural challenges.
Rationale	<p>Climate Resilient Agriculture (CRA) is an adaptation approach that seeks to improve the capacity of farming systems to withstand climate shocks and stresses while maintaining production, yields and profitability. The CRA approach is based on the application of best agricultural management practices that, over time and in different contexts, have evolved as simple and effective responses to experienced local climate and farming challenges. CRA also covers the application of farming inputs developed and tested to address local needs such as improved seeds, pest control inputs and irrigation. CRA promotes knowledge sharing and collective action for building resilience at the community level. It uses training and demonstration sites to develop the capacity of farmers in the application of best practices, which include, among others, those for soil organic carbon build up, in-situ moisture conservation, water harvesting and recycling for supplemental irrigation, water saving technologies, growing drought and flood tolerant varieties and improved livestock feed and feeding methods.</p> <p>In Saint Lucia, extension workers and farmers often lack access to information on CRA best practices and inputs. This reduces their potential to test and implement simple, cost-effective and environmentally sound solutions to the problems posed by climate variability and change and thus, limits their adaptive capacity. Helping farmers adapt to climate change is a priority as the damages caused by frequent tropical storms and recurrent drought and pests and diseases are amongst the most important factors leading to the overall decline in Saint Lucian agriculture and the increasing national food import bill.</p> <p>This project proposes to address the above problem by establishing a series of CRA demonstration farms to promote improved technologies. The project also includes a series of actions to communicate existing and generate new field-level CRA knowledge in Saint Lucia. These actions will be undertaken to:</p> <ul style="list-style-type: none"> • Promote the use of protected cultivation, including greenhouse technologies for specific crops • Research, develop and implement appropriate Integrated Pest Management (IPM) practices • Strengthen existing programmes providing training to farmers in Good Agricultural Practices (GAP) • Develop and expand drainage and irrigation infrastructure in key agricultural regions

CONCEPT NOTE 7

Project title **Climate Resilient Agriculture (CRA) Demonstration Farms: Key means to disseminate information for promoting and expanding effective and simple farming solutions to climate-induced challenges**

- Provide training on appropriate technologies including small/medium scale hydroponics and Aquaponics production.

The CRA demonstration farms and the implementation of a comprehensive programme of activities will therefore allow for the identification and testing of best practices, as well as hands-on training for replication. Further, the demonstration farms will permit growing and developing climate-adapted material (seeds, livestock, natural pesticides) for the country's farming communities to use and increase yields and income. The sales from these materials will contribute to sustaining the farm's activities.

Beneficiaries Research and Development (R&D) officers and farmers

Activities and Tasks

- Identify / select private farms interested in CRA demonstrations
- Setting up facilities at the CRA demonstration farms
- Identify, test, develop, produce and promote drought and salt-tolerant crops and pastures
- Implement germplasm conservation measures (In-situ and ex-situ/on farm) for identified hardy/unutilised crop native species (herbal/medicinal) and livestock varieties
- Identify, monitor and control existing and new Invasive species.
- Identify, observe and quantify the benefits of agro-biodiversity in strengthening the resilience of farms

Main outputs/products

- Protocols to select and screen drought and salt tolerant varieties
- Drought and salt tolerant crops and pastures identified, screened and evaluated
- Promising varieties tested at the farm and cultivated at selected farmer fields across geographical zones
- Proven climate resilient seeds and clonal materials propagated and multiplied for sale to farmers
- Knowledge and communication products and training services developed for scaling up the cultivation of proven climate-resilient species
- Training delivered to public, private and Civil Society Organisation (CSO) partners and climate resilient agriculture value chain actors
- Germplasm protocols and criteria to select, identify and conserve underutilised, hardy and native crop and livestock species
- Underutilised, hardy and native crop and livestock species identified, screened, selected and evaluated
- Protocols to identify, map, monitor and control invasive species developed
- Knowledge and communication products and services on invasive species
- Studies on how the best practical (traditional and modern) ways to increase agro-biodiversity for strengthening the resilience of farmers, crops, soils and livestock
- Knowledge and communication products and services on the benefits of agro-diversity

CONCEPT NOTE 7

Project title **Climate Resilient Agriculture (CRA) Demonstration Farms: Key means to disseminate information for promoting and expanding effective and simple farming solutions to climate-induced challenges**

Implementation

Responsible agency/partners: Government agency with responsibility for Agriculture, CARDI.

Indicative cost: USD 1,500,000

Duration: 5 years

Additional information

- This project is aligned with measures 6, 7, 9 10, 11, 12, 13, 14, 15, 18 and 37 in the Agriculture SASAP and can contribute to implementing measures 19, 20, 21, 23 and 45.
- The project is aligned with and supports the implementation of the Draft Agriculture Policy (2016 to 2021).

PROJECT CONCEPT 8. ESTABLISHMENT OF THE BEAUSEJOUR AGRICULTURE STATION AS NATIONAL CENTRE OF EXCELLENCE FOR CLIMATE RESILIENT LIVESTOCK PRODUCTION

CONCEPT NOTE 8	
Project title	Establishment of the Beausejour Agriculture Station as National Centre of Excellence for Climate Resilient Livestock Production
Objective(s)	To strengthen livestock production in Saint Lucia under a changing climate
<p>Rationale</p> <p>Climate Resilient Agriculture (CRA) is an adaptation approach that seeks to improve the capacity of agricultural systems to withstand climate shocks and stresses while maintaining production, productivity and profitability. The CRA approach is based on the application of best agricultural management practices that, over time and in different contexts, have evolved as simple and effective responses to experienced local climate and agricultural challenges. CRA also covers the application of agricultural inputs developed and tested to address local needs such as improved seeds, pest control inputs, irrigation and improved livestock breeds. CRA promotes knowledge sharing and collective action for building resilience at the community level. It uses training and demonstration sites to develop the capacity of farmers in the application of best practices, which include, among many others, practices for improving livestock feed and feeding methods.</p> <p>With climate change, sea-level rise, lower annual rainfall amounts, but more intense rains and tropical storms in the Caribbean and associated flooding episodes, are expected to increasingly affect Saint Lucia’s populations, economic activities and environment in the coming decades. The island’s agriculture sector has already started to suffer from the anticipated impacts of climate change, with damages caused by recent hurricanes, recurrent droughts, pests and diseases contributing to the abandonment of farming activities and to the overall national net food import bill.</p> <p>A sharp reduction in grazing livestock numbers in the past decades is one of the most conspicuous effects of declining agricultural activities in the country. This is of concern as fish stocks are also declining, thus reducing the prospects of Saint Lucia being protein self-sufficient in the future, compounded by the impact of climate change on livestock production. Direct impacts will be manifested through increased heat stress and reduced water availability, and indirect impacts will be experienced through decreasing pasture productivity and nutrient content and through the more frequent outbreaks of disease, including new types of disease.</p> <p>This project seeks to convert the Beausejour Agriculture Station into a National Centre of Excellence for Climate Resilient Livestock Production. The Centre will enable research for the application of existing and generation of new CRA best practices to strengthen livestock production in Saint Lucia. The Centre will also work to build capacities of livestock farmers, extension officers and all stakeholders of the livestock value chain in the country. Further, the Centre proposed will be focused on supporting national livestock systems to better withstand climate shocks while reducing greenhouse emissions.</p>	
Beneficiaries: Livestock farmers, other livestock value chain actors, extension officers	
<p>Activities and Tasks</p> <ul style="list-style-type: none"> • Make the necessary administrative and programmatic arrangements for converting the 	

CONCEPT NOTE 8**Project title Establishment of the Beausejour Agriculture Station as National Centre of Excellence for Climate Resilient Livestock Production**

Beausejour Agriculture Station into a National Centre of Excellence for Climate Resilient Livestock Production

- Design a programme of work for the Centre including research, development, demonstration and capacity building activities on CRA best practices for the following thematic areas:
 - Sustainable feed, pasture and grazing management
 - Climate resilient livestock facilities to reduce heat stress developed and promoted
 - Sustainable livestock waste management
 - Resilient livestock value chains

Main outputs/products

- Beausejour Agriculture Station relocated and enhanced to become a National Centre of Excellence for Climate Resilient Livestock Production
- Research on and testing of best CRA practices for sustainable livestock production conducted
- Best CRA practices demonstrated, promoted and transferred to farmers and other livestock value chain actors through capacity building activities (trainings -including peer-to-peer farmer trainings-, study tours, awareness raising campaigns, etc.)
- Communication products elaborated for each CRA best practice promoted
- Best CRA practices promoted by the Centre replicated and strengthened

Implementation

Government agency with responsibility for Agriculture

Indicative cost: USD 2,000,000 (Beausejour Agricultural Station will be relocated and funding will be required for this activity to ensure success)

Duration: 3 years

Additional information

- This project is aligned with measures 6, 9, 25, 26, 27, 32 and 37 in the Agriculture SASAP and can contribute to implementing measures 8, 12, 18, 19, 24, 32 and 45.
- This project supports the implementation of the Draft Agriculture Policy (2016 to 2021), which under Priority Area 1 calls for improving the livestock sector through a series of activities which are perfectly aligned with those proposed here, including among others, the following: the establishment of the Beausejour Agriculture Station as a national centre of excellence; disseminating good agricultural practices for sustainable livestock production; providing training to farmers on appropriate technologies in livestock production; encouraging the establishment of commercial farms for small ruminants.
- The CRA best practices for sustainable livestock production to be tested and if successful demonstrated at the Centre and promoted will include, but not be limited to:
 - Use of heat tolerant pastures and livestock breeds.

CONCEPT NOTE 8

Project title **Establishment of the Beausejour Agriculture Station as National Centre of Excellence for Climate Resilient Livestock Production**

- Improved pasture management techniques (e.g. rotational grazing, appropriate stocking rate and enhanced access to safe water -to reduce Amblyomma tick populations-).
- Climate resilient livestock housing facilities (e.g. well-ventilated shelters for cut and carry systems) and technologies (passive water cooling systems)
- Improved livestock waste management techniques and technologies (e.g. vermin-compost; geo-membrane biodigesters).

PROJECT CONCEPT 9. UNDERTAKING KEY POLICY AND REGULATION UPDATES TO ENABLE CLIMATE CHANGE ADAPTATION PLANNING IN THE AGRICULTURE SECTOR

CONCEPT NOTE 9	
Project title	Undertaking key policy and regulation updates to enable climate change adaptation planning in the agriculture sector
Objective(s)	To integrate Sea Level Rise (SLR) considerations into the Agriculture Policy and Strategy, implement land use policy and zoning and update regulatory standards for enabling climate adaptation planning in Agriculture and other key productive sectors in Saint Lucia
Rationale	<p>Saint Lucia is highly vulnerable to climate change and has already started experiencing some of its anticipated impacts, such as, recurrent drought and more intense and unpredictable rainfall events triggering landslides and flooding. The country is also often in the path of Caribbean tropical storms, expected to increase in intensity in the coming years and, as with other Small Island Developing States, it is highly vulnerable to Sea Level Rise (SLR).</p> <p>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. The GoSL has also started a comprehensive National Adaptation Planning process. However, planning adaptation at the sectoral level is hampered by the fact that some key policies lack the integration of pertinent climate change considerations or have not been implemented. In this regard, notable are the absence of implemented climate change-informed land use policies and land zoning and the lack of inclusion of SLR considerations into the Draft Agriculture Policy Framework and Strategy (2016 to 2021). Regulatory standards should also be updated to include the promotion of Climate Resilient Agriculture (CRA) best practices.</p> <p>This project proposes to address the above-mentioned gaps by conducting all the necessary background studies for including SLR, salinity intrusion, and land use considerations into the Draft Agriculture Policy and Strategy and for enabling the development and implementation of land use planning and zoning regulations, crucial for national development and adaptation.</p> <p>The results of the project will allow clarifying land tenure issues and solve conflicts related to squatting of abandoned agricultural lands and access to land by livestock farmers. The project will also offer instruments for planning and enforcing regulations to improve environmental conditions, reduce land degradation, safeguard prime agricultural land, protect water resources and minimise climate change-related risks to lives and property in the country (e.g. by preventing settlements or agricultural activities in areas zoned as prone to SLR-submersion or landslides or as priority conservation areas).</p>
Beneficiaries:	All Saint Lucians
Activities and Tasks	<ul style="list-style-type: none"> Conduct analysis of gaps and opportunities to incorporate SLR-related impacts in the Agriculture Policy

CONCEPT NOTE 9

Project title **Undertaking key policy and regulation updates to enable climate change adaptation planning in the agriculture sector**

- Develop SLR-related land use strategies to be integrated into the Agriculture Policy
- Conduct analysis of gaps and opportunities for the Land Policy to safeguard quality agricultural lands
- Land Policy to enable land spatial planning to safeguard quality agricultural lands implemented, monitored and improved and operational
- Identify, survey and cost the restoration of abandoned agricultural lands
- Identify current production areas/farms at risk of SLR impacts and define potential relocation areas
- Integrate the SLR-related land use strategies developed into the Agriculture Policy (2016 to 2021)
- Develop Legislation to implement and enforce SLR-related land use strategies
- Update and enforce Regulatory standards to promote best practices in Climate Resilient Agriculture

Main outputs/products

- SLR and land use strategies incorporated into the Agriculture Policy (2016 to 2021)
- Land Policy (and zoning) safeguarding quality agricultural lands implemented, monitored and improved
- Regulatory standards governing productive activities in rural areas updated to promote CRA best practices
- Abandoned agricultural lands identified, surveyed and costed (land and restoration work)
- Farms in areas prone to landslides, SLR or in areas zoned for conservation and thus in need of relocation and potential areas for relocation identified.

Implementation

Government agency with responsibility for Agriculture Department of Physical planning (Crown Lands)

Invest Saint Lucia

Attorney Generals (Legislative Drafting Department)

Other partners: Ministry of Tourism, Housing

Indicative cost: USD 800,000

Duration 3 years

Additional information

- This project is aligned with measures 1, 2, 3 and 4 in the Agriculture SASAP and can contribute to implementing measure 5, 12, 28, 39 and 41
- The project will contribute to the implementation of the Government agency with responsibility for Agriculture's Land Bank project which aims at identifying, mapping and managing existing crown lands and abandoned farmlands suitable for agriculture for the GoSL to acquire/ access and operate.

PROJECT CONCEPT 10. IMPROVING CLIMATE SERVICES IN SAINT LUCIA THROUGH THE DEVELOPMENT OF A FREE AGRO-MET MOBILE APP FOR THE COUNTRY'S FARMING COMMUNITY

CONCEPT NOTE 10

Project title: Improving climate services in Saint Lucia through the development of a free agro-met mobile app for the country's farming community

Objective: To develop a free Agromet mobile app able to guide activities and reduce losses due to extreme weather events

Rationale

Agriculture is an important traditional productive sector in Saint Lucia. It provides 21% of total employment and is dominated by small-scale (less than 3 acres) rain-fed farming operations. However, in recent decades, agriculture has been increasingly affected by climate variability, extreme weather events and pests and disease outbreaks. The damages caused by these events have greatly contributed to the abandonment of farming areas and an overall decline in agricultural production and productivity.

The development of climate services, providing real-time information tailored to address Saint Lucian farmers' needs would provide them with the information they need to make decisions and act to reduce damages and losses in the face of weather events, resulting in more profitable agriculture. However, no adequate agricultural climate services are available in the island.

Climate services in the Caribbean play a key role in reducing tropical storm-related damage. These services are provided by the Caribbean Institute for Meteorology and Hydrology (CIMH) and the information is locally transmitted by national meteorological offices. In Saint Lucia, climate information used to be shared with the farming community through an Agro-met bulletin published quarterly. This publication was difficult to sustain, and the data shared was static; allowing for long term planning, but ineffective for the day-to-day running of a farm, as often, the information reached farmers only after they had experienced the extreme weather events.

There have been some attempts to share climate information with farmers via mobile phones (SMS messages) but this is expensive, the number of characters that can be sent through SMS is limited and graphs cannot be sent, although graphs could ease the interpretation of the information transmitted. Currently, Saint Lucians can access local weather data via various websites, but these are prepared for the general public and may not contain the interpretation of the data needed for the farming community. A mobile app tailored to address climate information needs of Saint Lucian farmers could help solve this situation.

This project proposes the design and implementation of the mobile data app, seen as a feasible climate service for the country as there is mobile coverage in most of the island and the large majority of phones presently sold in the country are smart phones. It is expected that the app will strengthen Saint Lucian farmers' ability to timely respond to extreme weather events, thus reducing losses, and allowing them to more easily plan their farm activities using up-to-date weather forecasts. The mobile app proposed can also be used to help the Government agency

CONCEPT NOTE 10**Project title: Improving climate services in Saint Lucia through the development of a free agromet mobile app for the country's farming community**

with responsibility for Agriculture in giving real-time agronomic guidance to the farming community, contributing to improve the productivity of the sector.

The mobile app will be managed by the Government agency with responsibility for Agriculture and in close collaboration with the Meteorological Office, with each institution being responsible for the population of the relevant daily data sets and their analysis. Some aspects of the app can be automated with the compiler generating a prediction of forecasted weather effects and guidance on action for various crops and livestock.

Beneficiaries: All farmers in Saint Lucia

Activities and Tasks

- Design and develop the ICT platform for the mobile app to share climate data and agronomic guidance. The platform should contain a simulator able to predict the potential effects of weather events on the island major crops and livestock breeds.
- Conduct awareness raising campaigns on the app service and utilisation
- Improve Agromet and early warning infrastructure
- Enhance service delivery and warnings to communities

Main outputs/products

Improved early warning and community preparedness, including: (i) strengthening “last mile” connectivity to ensure appropriate understanding and use of information, and (ii) mobilisation and sensitization of community and establishing effective feedback mechanisms for communities at risk

Implementation: Government agency with responsibility for Agriculture and Met Office

Cost estimate USD 300,000

Duration 2 years

Additional information

- This project is aligned with measure 40 in the Agriculture SASAP and can contribute to implementing measures 2, 5, 42 and 45
- The project also supports the implementation of Priority Area 11 of the Draft Agriculture Policy (2016-2021).
- With additional funding this project could be extended to fulfil the needs of fisherfolk.

PROJECT CONCEPT 11. AGRICULTURAL DIVERSIFICATION AND AGRO-PROCESSING FOR INCREASING CLIMATE RESILIENCE IN VULNERABLE FARMING COMMUNITIES

CONCEPT NOTE 11	
Project title	Agricultural diversification and agro-processing for increasing climate resilience in vulnerable farming communities
Objective(s)	<ul style="list-style-type: none"> • To diversify agricultural products and create value chains for empowering youth in vulnerable communities to lead sustainable and climate resilient agri-businesses • To collect and preserve germplasm and biological resources • To increase the range of local and marketable food products
Rationale	
<p>With climate change, sea-level rise, lower annual rainfall amounts, but more intense rainfall and tropical storms in the Caribbean and associated flooding episodes, are expected to increasingly affect Saint Lucia’s populations, economic activities and environment in the coming decades. The island’s agriculture sector has already started to suffer from the anticipated impacts of climate change, with damages caused by recent hurricanes, recurrent droughts, pests and diseases contributing to the rapid abandonment of farming activities and to the overall national net import food bill. While banana production for export dominates Saint Lucian farming, it has also declined in the past decades. The diversification of Saint Lucia’s crop production has been repeatedly presented as a logical strategy for adaptation in this sector. In fact, it is promoted in various policies, including the national Climate Change Adaptation Policy of 2015.</p> <p>This project proposes the diversification of food crop cultivation and use and the establishment of sustainable agro businesses in the communities of Mon Du Don and Babonneau, vulnerable to climate variability and change and currently suffering from high levels of youth unemployment.</p> <p>The project focuses on the establishment of a public-private investment venture for agro-processing Saint Lucian aromatic herbs and native fruits. Agro-processing will add value and extend the shelf life of local (including native) fruits which are produced in excess and often lost during the harvesting seasons. The project will also promote the cultivation of aromatic herbs to produce oils and teabags. Young farmers will participate as shareholders in this venture.</p> <p>To identify the products with the greatest potential for the venture, a detailed market study will be conducted within the Organisation of Eastern Caribbean States (OECS) islands. The identified products will be produced and the markets within the OECS tested.</p>	
Beneficiaries: Youth from Mon Du Don and Babonneau and other vulnerable groups. 20 – 50 direct beneficiaries; 80 – 200 indirect beneficiaries.	
Activities and Tasks	
<ul style="list-style-type: none"> • Identify fruit species to be collected and herbs to be cultivated • Identify the agro-products of the venture through an OECS market study • Establish (acquire if necessary) the production facilities • Introduce the project to unemployed farming youth and identify the participants in the venture 	

CONCEPT NOTE 11

Project title **Agricultural diversification and agro-processing for increasing climate resilience in vulnerable farming communities**

- Set up of production centres for the products identified as with highest market potential (e.g. oils, tea bags, dry fruit, vinegars, juice wines, etc.)
- Establish gen banks for the species of interest (life of the project)
- Conduct training workshops on material collection/cultivation, agro-processing and business concepts for the youth
- Cultivate herbs, collect fruits and run the agro-processing systems
- Pilot the products locally
- Produce a manual for each successful agro-processing system established
- Conduct a market test at the identified OECS markets.

Main outputs/products

- Germplasm bank
- Agro-processing facilities established
- Company formed and registered
- Market study
- First 6 products elaborated and tested
- Range of products for local consumption

Implementation

Marketing Unit, Government agency with responsibility for Agriculture
Biodiversity, Sustainable Development and Environment Division

Indicative cost: USD 150,000

Duration: 2 years

Additional information

- This project is aligned with the Agriculture SASAP's measures 9, 14, 22 and 43 and can contribute to implementing measures 6,7,18,20,21,34,35,36,37,38 and 45
- This project can build on the experience gained previously by Government agency with responsibility for Agriculture in the implementation of the development of the fruits, vegetables, and roots and tubers value-chains in Saint Lucia