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MAKING ADAPTATION WORK: AN INSTITUTIONAL ANALYSIS OF CLIMATE CHANGE ADAPTATION IN TRINIDAD AND TOBAGO AND SAINT LUCIA

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List of Acronyms and Abbreviations

ARIA	Rapid Institutional Assessment for Adaptation
CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community
CCCCC	Caribbean Community Climate Change Center
DCA	Development Control Authority
ECLAC	Economic Commission for Latin America and the Caribbean
EIA	Environmental Impact Assessment
EMA	Environmental Management Authority (Trinidad and Tobago)
FOIA	Freedom of Information Act
GORTT	Government of the Republic of Trinidad and Tobago
GOSL	Government of Saint Lucia
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IMA	Institute of Marine Affairs (Trinidad and Tobago)
MEAU	Multilateral Environmental Agreements Unit
MEWR	Ministry of Environment and Water Resources
NAC	National Adaptive Capacities
NCCC	National Climate Change Committee (Saint Lucia)
NCCPAP	National Climate Change Policy and Action Plan
ODPM	Office of Disaster Preparedness and Management (Trinidad and Tobago)
PPCR	Pilot Program on Climate Resilience
SDED	Sustainable Development and Environment Division (Saint Lucia)
SNC	Second National Communications (to the UNFCCC)
SPCR	Strategic Program for Climate Resilience
TAI	The Access Initiative
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

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EXECUTIVE SUMMARY

Climate change is already impacting human and natural systems through higher temperatures, rising seas, less predictable rainfall patterns, and reduced ecosystem services, to list a few. As international agreements stall or fail to set hard targets for greenhouse gas emission reductions, nations, states and communities must grapple with policies and plans to adapt to increased levels of risk for existing threats, and often to address new ones created by a warming world. Adaptation requires the capacity and willingness across sectors and scales to assess threats, identify vulnerabilities, marshal resources, and take action, all while monitoring results, and adjusting to new information. The uncertainty of the timing and severity of climate impacts demands flexible and responsive institutions.ⁱ In addition to information problems, adaptation effectiveness is shaped by governance processes, including coordination, political leadership, inclusive decision-making, and accountability.ⁱⁱ The flexibility required to make decisions when confronting uncertainty and extent of climate change impacts may emphasize “soft adaptations”, such as behavioral changes or institutional arrangements over physical infrastructure.ⁱⁱⁱ These types of changes are often more equitable and legitimate when the public is meaningfully engaged.^{iv}

In 2013, the CARIBSAVE entered into a research agreement with the Caribbean Natural Resources Institute (CANARI) to conduct civil society-led assessments of key institutional functions important for effective design and implementation of climate change adaptation policies in Trinidad and Tobago and Saint Lucia. CANARI invited the World Resources Institute (WRI) and the Saint Lucia National Trust to help conduct the research.

The project was based off of three important assumptions, supported by empirical evidence. The first is that while understanding local level context are essential for resilience building, national-level policy-making and implementation is critical to address large scale climate change threats. In many cases, the implementation of adaptation plans is piecemeal, often due to insufficient financing, but also because of an incomplete understanding of vulnerabilities, a public that is unaware or disengaged, poor coordination, weak accountability, or lack of integration of adaptation into sectoral plans and policies. From the Intergovernmental Panel on Climate Change (2014):

“National governments can coordinate adaptation efforts of local and subnational governments, for example by protecting vulnerable groups, by supporting economic diversification, and by providing information, policy and legal frameworks, and financial support (robust evidence, high agreement).”

The second assumption is that institutional capacities must be measured and monitored so that decision-makers can respond accordingly and the public can hold responsible actors accountable. With the Green Climate Fund recently made operational, national ownership and sovereignty over adaptation

options will be bolstered by strong, functioning institutions.^{vi} Finally, the ability and capacity of civil society to engage in the adaptation planning and implementation process has the potential to improve information flow, produce more relevant adaptation options, and provide public accountability.^{vii}

The ARIA institutional analysis of climate change adaptation in Trinidad and Tobago and Saint Lucia has provided researchers with a snapshot of how well key institutional functions, namely 1) vulnerability assessment, 2) prioritization of adaptation activities, 3) coordination, 4) information management, and 5) mainstreaming, are performing and enabling effective adaptation policy implementation. While both countries are middle to high income, and thus have some amount of adaptive capacity, as small island states in a disaster-prone region, they are exposed to tropical storms, sea level rise, coral bleaching and acidification, and are projected to face increasing temperatures and reduced annual average rainfall.

Both nations have contributed two national communications to the UNFCCC and have developed climate change adaptation policies. They are also both part of CARICOM, which has developed a regional implementation plan. However, vulnerability needs to be more thoroughly assessed in Trinidad and Tobago, and both countries can do more to assess socioeconomic and political drivers of vulnerability, including health risks and loss of livelihoods and culture. Both countries need to develop an inventory of adaptation activities, including projects, programs, and efforts to integrate adaptation into sectors. This inventory can help provide learning, reduce duplicative efforts, and increase transparency to the public.

Horizontal and to a lesser extent vertical coordination efforts appear to be more institutionalized in Saint Lucia than Trinidad and Tobago. The National Climate Change Committee meets regularly and has broad representation, although civil society participation and transparency to the public could be improved. These processes are just beginning in Trinidad and Tobago and are confined mostly to disaster management and coastal zone management. These early processes should be a testing ground for improving stakeholder engagement and coordination.

Information management is inadequate in both countries. Systems for monitoring and disseminating information are too often not functioning, out of date, or not reaching their target audiences. Efforts should be prioritized to maintain and enhance stakeholder-informed platforms that provide accessible and useful climate info, relevant for different sectors.

Mainstreaming of climate change adaptation has yet to be formalized through regulations, but is a central part of the CARICOM Regional Implementation Plan, which is expected to be followed by participating governments. Saint Lucia's Pilot Program on Climate Resilience is the most advanced effort thus far to develop initiatives to mainstream adaptation.

Overall, transparency, participation and accountability mechanisms could be improved to enable better public understanding, engagement, and ability to push for accountability. Meanwhile, agencies are sometimes unaware of what each other are doing, suggesting that better communication procedures be adopted. The results from this project help to illuminate current progress towards meeting national and regional goals and should be used to help influence policy decisions and implementation.

1 INTRODUCTION

The Caribbean, as a region, is experiencing warmer temperatures, reduced annual average rainfall, sea level rise, more intense tropical storms, and loss of coral reef habitat due to bleaching (both from local pollution and climate induced) and acidification.^{viii} Rainfall has been decreasing in the region, on average 0.18mm per year, averaged over the last 100 years. Warmer temperatures are likely to affect crop yields, stress freshwater supplies, and present human health risks.

Of the two nations chosen for the pilot study, Trinidad and Tobago is larger and wealthier, with its endowment of oil and natural gas that is produced for export. Saint Lucia is more reliant on tourism for its economic well-being. Despite these differences, both nations are economically vulnerable to climate impacts. A recent forecast predicted that impacts resulting from climate change could cost Trinidad and Tobago equivalent to 4% of its GDP by 2025, with Saint Lucia facing costs equivalent to 12.1% of its GDP.^{ix}

In 2011, the Caribbean Community (CARICOM) Climate Change Center (CCCC) produced a regional implementation plan for Caribbean governments to implement effective adaptation policy as part of climate-resilient development. CARICOM governments had mandated the CCCC to produce the plan and are expected to implement its recommendations. It contains five strategic elements, including: greenhouse gas reductions, implementation of adaptation measures to address vulnerabilities, mainstreaming of climate change adaptation into sustainable development strategies, reducing human and natural system vulnerability, and improved conservation of forests for ecosystem services.^x

As part of the third theme of CARICOM's Regional Implementation Plan, national governments are expected to:

- Provide an appropriate political, legal, and administrative environment for the implementation of actions to meet the Regional Framework's strategic elements and goals including monitoring and enforcement.
- Undertake concrete and positive actions to ensure that climate change is mainstreamed into the national development processes including national development plans and budgets.
- Encourage and institutionalize the participation of all government entities in the development of appropriate climate hazard risk mitigation measures.
- Promote sustained partnerships with non-state actors including the private sector and community-based and non-governmental organizations.^{xi}

The expectations are that civil society will:

- Take full responsibility for arming themselves with appropriate information to guide decisions at the individual, organisational, or community level regarding climate hazard risk management.
- Take all opportunities to participate in decision making processes and hold decision makers accountable for achieving the transformation to more climate resilient economies.
- Monitor the activities of government and the private sector to ensure that government policies and programmes enhance resilience.

- Engage with decision makers in ensuring that the impacts of a changing climate and the need to develop low carbon economies remain on the national and regional policy agenda.^{xii}

In order to achieve these goals, the Implementation Plan states that “institutional and governance building blocks” are “key priorities for transformational change”. It identifies information management and access and public engagement, among others, as cross-cutting challenges to achieving transformational change. Moreover, governments were expected to be able to make significant progress towards these goals within two years. The results from the ARIA assessments should offer a contribution towards monitoring the progress of Trinidad and Tobago and Saint Lucia in building institutional capacity, producing and sharing information for decision-making, and engaging with communities and stakeholders.

2 PROJECT BACKGROUND

In 2013, CARIBSAVE entered into a research agreement with the Caribbean Natural Resources Institute (CANARI) to conduct civil society-led assessments of key institutional functions important for effective design and implementation of climate change adaptation policies in Trinidad and Tobago and Saint Lucia. CANARI invited the World Resources Institute (WRI) and the Saint Lucia National Trust (SLNT) to help conduct the research.

The project had the following objectives:

1. Analyze the state of institutional capacity and readiness to implement climate change adaptation policies to identify strengths and weaknesses using the “Rapid Institutional Analysis for Adaptation” (ARIA) toolkit.
2. Develop high-priority and low-cost next steps within national and regional policy contexts.
3. Assess the level of transparency in adaptation policy-making and planning and the opportunities for public involvement.
4. Conduct “deep dive” assessments into three priority areas selected by project participants for each country to better understand institutional capacity at the sectoral level.
5. Build civil society capacity to more meaningfully engage in these processes through use of the toolkit and interaction with relevant government agencies.

2.1 ARIA Toolkit

The ARIA toolkit was developed by WRI to provide civil society organizations with a framework, methodology and approach to assessing national institutional capacities to effectively develop and implement climate change adaptation policy. It was designed to help policy-makers identify and fill gaps, establish a baseline for monitoring, and gather and synthesize resources.^{xiii} The ARIA toolkit was developed in response to civil society demand from the Access Initiative’s⁴ network of 200+ members in 50+ countries.

⁴ The Access Initiative promotes the rights of the public to access environmental information, participate in decision-making, and access mechanisms of justice or grievance. www.wri.org/tai

The ARIA toolkit uses a comprehensive workbook to assess the quality of five critical functions for climate change adaptation: 1) assessment 2) prioritization 3) coordination 4) information management and 5) mainstreaming.

3 METHOD

The ARIA toolkit was used in both Saint Lucia and Trinidad and Tobago to assess the capacities of national institutions to effectively adapt to climate change. Research in each country was conducted in two phases:

Phase 1:

During this phase, the lead organizations, SLNT and CANARI, broadly examined the capacity of national institutions to effectively adapt to climate change in their respective countries. Information to complete the ARIA toolkit workbooks were gathered through desk-reviews of key documents and interviews with informants from key agencies knowledgeable about climate change and climate change adaptation initiatives in each country.

Phase 2:

For the second phase of the study, each country examined the capacity of national institutions to effectively adapt to climate change within three priority sectors. The priority sectors varied for each country and were selected and agreed upon by project stakeholders during workshops lead by the Saint Lucia National Trust and CANARI in their respective countries. The priority sectors were selected based on the findings of the phase one research.

The research to complete the ARIA toolkit workbooks for phase two was undertaken differently in each country. In Saint Lucia, as the ARIA toolkit recommends, the workbook for each priority sector was completed by three separate civil society organizations. The organizations utilized a similar approach as in phase one by conducting desk reviews and interviews with key agencies to fill in the information required in the workbooks.

In Trinidad and Tobago, due to limitations on time and funding, a consultant was hired to do the desk reviews and conduct interviews with key agencies to complete the ARIA workbooks for all three priority sectors.

4 RESEARCH FINDINGS AND ANALYSIS BY COUNTRY

4.1 Trinidad and Tobago

Trinidad and Tobago covers an area of 5,128 km² and has a population of roughly 1.3 million. The majority of the population lives on Trinidad, which comprises 94% of the total land area. Trinidad and Tobago is a high-income non-OECD country with a 2012 GDP of \$23.3 billion, and a GNI per capita of \$14,710.^{xiv} It is ranked 67th out of 187 countries in the UNDP Human Development Index—in the “High Human Development” category.^{xv} It is one of the wealthiest countries in the Caribbean region, due mostly to exports of oil and natural gas.

In 2010, the “People’s Partnership” coalition won the general elections, which initiated a new policy framework, priorities, and restructuring of national ministries. The “medium-term” policy framework (2011-2014) that resulted focuses on economic diversification and competitiveness, reduction of poverty and economic inequality, crime and safety, and innovation. It seeks to accomplish these goals in part through greater collaboration and coordination between government ministries. As part of the restructuring, the national climate change focal point—including the Multilateral Environmental Agreements Unit—was shifted to the newly created Ministry of Environment and Water Resources. In 2012, the Inter-American Development Bank approved a loan for institutional strengthening of the Environmental Management Authority (EMA) in order to improve its coordinating role in mainstreaming environmental management and climate change related priorities into all development sectors.^{xvi}

Included in this framework is a goal of mainstreaming climate change into the national development policy framework.^{xvii} Also part of the framework is building adaptive capacity through a “Comprehensive Disaster Management Policy Framework” in order to increase the resilience of vulnerable communities. Finally, this overarching policy acknowledges the importance of citizen participation in decision-making, noting “*Government will ensure that ‘the Voice of the People’ is heard and taken into account through a participatory, consensus oriented, accountable, transparent, responsive, equitable and inclusive process that follows the rule of law.*”^{xviii}

In its 2011 National Climate Change Policy, the government identified agriculture, human health, human settlements and infrastructure, water resources, and coastal zones as the Trinidad and Tobago’s most vulnerable sectors. These vulnerabilities are a result in part of exposure to increasing temperatures, reduced rainfall, sea level rise, more intense extreme weather events, and coral reef loss due to bleaching and acidification.^{xix} In addressing adaptation challenges, the policy focuses on strengthening institutional arrangements, conducting vulnerability assessments, revising and aligning sectoral policies, mainstreaming climate change with development policies, and building community and ecosystem resilience.^{xx} The policy is intended to work in concert with other relevant statutes, such as the National Environmental Policy and those governing forests, wetlands, protected areas, and other sectors.

In order to engage the public and build awareness and capacity, the Government pledged *inter alia* to “ensure that national and local stakeholders have equitable access to and benefit from information and knowledge on climate change impacts, mitigation and adaptation, including information and knowledge from foreign stakeholders and researchers”.^{xxi} It calls for free exchange of information and data between agencies in order to implement the policy effectively. It also pledged to develop a program to engage the public on the policy and its importance within one year and to conduct a five-year review and revision with civil society and public input.

Trinidad and Tobago established a national “environmental fund” in 2008, called the Green Fund, which is financed through a 0.1% tax on gross sales or receipts of companies that conduct business in the country. The Green Fund provides grants to non-governmental organizations and other groups that focus on “remediation, reforestation, or conservation of the environment”. As of 2013, it had financed two projects related to building ecosystem resilience and conserving water.

Community-scale adaptation projects have most frequently been funded through the Global Environmental Facility’s Small Grant Fund (administered by the United Nations Development

Programme) and a Community Disaster Risk Reduction Fund supported by multiple multilateral finance institutions.⁵

4.2 Findings

National Overview (Phase I)

Desk reviews were complemented with interviews of 10 agencies and NGO stakeholders. Twenty other agencies or organizations did not respond to interview requests.

4.2.1 Assessment

Trinidad and Tobago has yet to carry out a national vulnerability assessment. During the period of research, the Ministry of Environment and Water Resources was drafting a Terms of Reference for conducting a national vulnerability assessment, but no materials or timeline were made available.^{xxii} The Office of Disaster Preparedness and Management (ODPM) is conducting a National Preliminary Vulnerability Assessment, which will categorize vulnerabilities by environmental, physical, socio-cultural, and economic. However, this assessment focuses on disasters and as such includes some, but not all impacts of climate change.

There have been very few sectoral assessments, with most substantial assessments conducted by ECLAC to assess vulnerabilities to agriculture and human health. Environment Tobago is conducting an assessment with the University of Calgary to assess vulnerabilities to the tourism and fishing sectors of southwest Tobago.^{xxiii} The Institute for Marine Affairs has set up a working group to look at coastal vulnerability and climate change adaptation.

The ODPM has a mandate to “build disaster risk management and climate change adaptation capabilities with...partners to coordinate response...”.^{xxiv} It is currently conducting an inventory of adaptation activities and is starting a collaboration process with other entities. It is not clear what the ultimate vision for this process is, or what level of coordination is occurring with the Ministry of Environment and Water Resources. While extreme weather disasters are one manifestation of climate impacts, more gradual change may require a different type of planning.

The assessment indicators for Trinidad and Tobago are evaluated in Table 1 below.

TABLE 1: ASSESSMENT INDICATORS FOR TRINIDAD AND TOBAGO

NOTE ON TABLES: N/A means that the response to the Indicator was “No”, meaning that that the Qualities are Not Applicable

Indicator	Indicator quality	Response (Yes / Limited / No)
Is there a comprehensive assessment of vulnerability and impacts at the national level? If not, and only sub-national or sectoral assessments exist,	Assessment(s) include(s) socioeconomic and political drivers of vulnerability.	N/A (several sectoral assessments underway, none completed at time of research)
	Assessment methodology is	N/A

⁵ Including the Caribbean Development Bank, Canadian International Development Agency, and the United Kingdom’s Department for International Development

review these using a worksheet for each assessment.	made transparent.	N/A
	Broad set of stakeholders were engaged in assessment development.	
	Assessment (if national) includes review of existing sub-national assessments, including community-based assessments.	N/A
	Assessment(s) covers all sectors and regions.	N/A
	Assessment(s) includes exposure to climate.	N/A
Is there an inventory of existing adaptation efforts nationally? If not, and only sub-national or sectoral inventories exist, review these using a worksheet for each inventory.	(No qualities for this indicator)	No inventory exists
An institution (or institutions) has/have a mandate to produce a vulnerability and impacts assessment and/or a national inventory of adaptation efforts iteratively over time.	The mandated institution reports to an appropriate authority.	Yes
	The mandated institution coordinates appropriately with other institutions.	Limited
	Sufficient budget is provided for ongoing assessments.	Limited
	Staff carrying out assessment has sufficient skill and knowledge.	Yes

4.2.2 Prioritization

There is currently no public process to set national priorities for climate change adaptation in Trinidad and Tobago, although some organizations have developed their own tools to set priorities for adaptation. The MEWR expects to create a process for prioritization after it completes the Terms of Reference for vulnerability assessments. As no prioritization process currently exists, there is also no process for revisiting priorities and reassessing based on new information.

There is no national budgetary allocation specifically for climate change adaptation, rather project cycle funding is usually sought through the Inter-American Development Bank (IDB), the United Nations Development Programme (UNDP), or the UNFCCC Adaptation Fund. It was also mentioned that climate change adaptation projects undertaken by government agencies may be funded through budgetary allocations of the Public Sector Investment Program (PSIP). The prioritization indicators for Trinidad and Tobago are evaluated in Table 2.

TABLE 2: PRIORITIZATION INDICATORS FOR TRINIDAD AND TOBAGO

Indicator	Indicator Quality	Response (Yes / Limited / No)
<p>There is a process for identification of priority populations, geographies, or sectors for adaptation in the country. If multiple processes exist in different institutions, describe the process (or lack of) coordination and integration of priorities.</p>	<p>Identification of priorities considers critical sectors, geographic regions, vulnerable populations, ecosystems, and infrastructure.</p>	<p>N/A—process under development by MEWR</p>
	<p>Process for identification of priorities is transparent and publicly available.</p>	<p>N/A</p>
	<p>Broad set of stakeholders were engaged in identification process— including vulnerable and marginalized groups – in order to assure that priorities are informed by a broad range of perspectives.</p>	<p>N/A</p>
	<p>Institutional needs are identified in relevant general planning documents, such as sectoral strategies or regional development plans.</p>	<p>N/A</p>
	<p>Prioritization uses cost-benefit analysis that is stakeholder-driven.</p>	<p>N/A</p>
<p>Budgetary processes exist to channel finance to adaptation institutions.</p>	<p>Budgetary priorities reflect priorities for adaptation described in strategic documents.</p>	<p>N/A—there is no national budget specifically for adaptation measures in response to climate change.</p>
	<p>Funds are effectively appropriated.</p>	<p>N/A</p>
	<p>Budgetary institutions able to effectively centralize international finance.</p>	<p>N/A</p>
	<p>Budgetary processes meet international standards for transparency and participation.</p>	<p>N/A</p>
<p>A time period and process have been set for revisiting priorities set forth in official prioritization decisions.</p>		<p>N/A—There is no prioritization process</p>

4.2.3 Coordination

There is no formal process for identifying coordination needs; however, several agencies identified coordination needs during interviews.

The ODPM has recently received a mandate to coordinate climate change adaptation as it relates to disaster and emergency preparedness. During an interview with an ODPM representative, it was noted that while coordination has been limited in its effectiveness, it has increased over the past 5 years due to the ratification of international policies and the development of new guiding documents.^{xxv} At the time of the Phase I ARIA report, the ODPM was still in the process of incorporating this new mandate into its institutional arrangements.

Another office, the Multilateral Environmental Agreements Unit (MEAU), which falls under the Ministry of Environment and Water Resources (MEWR), is responsible for coordinating the country’s submissions to the UNFCCC and Kyoto Protocol. The MEAU also chairs a multi-stakeholder committee that advises on climate change related activities in Trinidad and Tobago. The stakeholders participating on this committee include public sector agencies, the Institute of Marine Affairs (IMA), as well as civil society organizations.

In August 2012, the IDB approved another loan program for the institutional strengthening of the Environmental Management Authority (EMA) (also under the MEWR) in order to improve its coordinating role in mainstreaming the environmental management and climate change related priorities into all development sectors. To this point, there has not been a publicly available document on the committee, its membership, or anything it has produced.

A series of public consultations were also undertaken in various communities in Trinidad and Tobago in early 2013 for constitutional reform, and a round of public consultations for the development of an Integrated Coastal Zone Management Policy were planned for later in the year. Apart from these public meetings, the co-ordinating agencies for these consultations also provide opportunities for in-person and online submission of recommendations and views. The GORTT has also convened multi-stakeholder committees for the various sectors as needed on projects and issues. For example, there is a Cabinet-appointed multi-stakeholder steering committee to develop an Integrated Coastal Zone Management Policy Framework, Strategies and Action Plan for Trinidad and Tobago. Coordination indicators for Trinidad and Tobago are evaluated in Table 3.

TABLE 3: COORDINATION INDICATORS FOR TRINIDAD AND TOBAGO

Indicator	Indicator Quality	Response (Yes / Limited / No)
Coordination needs for effective adaptation have been identified and made publicly available.	Vertical coordination needs have been considered and are described in a publicly available document.	Limited—needs have been identified, but there is neither a process to address them nor have they been published.
	Coordination needs across sectors and ministries have been considered and are described in a publicly available document.	Limited
There is an established, coordinating body or council tasked with adaptation	The coordination body has a clear mandate and reports to an appropriate authority.	Limited

coordination.

	Sufficient resources have been appropriated for coordination activities.	No
	Coordination body has appropriate membership and skill sets.	No
	There is a system for monitoring and review of the coordination process.	No
	The public has mechanisms to ensure that actions for coordination have been undertaken.	No
To what extent is the coordinating body functioning effectively?	The coordinating body meets with enough regularity to effectively maintain coordination.	No
	Findings from coordination reviews are adopted by relevant agencies.	No
	Coordinating body participants indicate that coordination has and continues to improve.	Yes

4.2.4 Information Management

Overall, the national assessment revealed that various governmental agencies collect information regarding climate change but there is no mechanism to consolidate this information and it was not always publicly available. For example, the Forestry Division (part of the Ministry of Housing, Land and Marine Affairs) collected but did not share data that could be used to inform climate change adaptation. Additionally, any monitoring that currently exists is ad hoc. There is also no organization with the specific mandate to analyze climate-adaptation-relevant information for the country in a way that is useful for key stakeholder groups. However, the ODPM indicates at least some level of acknowledgement that this is within its mandate for climate change adaptation.⁶

The Department of Natural Resources and Environment in Tobago has purchased equipment to monitor climate-related data in the forest and hopes to purchase equipment to monitor sea level rise in the near future.⁷

The closest thing that Trinidad and Tobago has in relation to a national platform for information sharing regarding climate change adaptation is the Trinidad and Tobago's Meteorological Service's website. This website includes climate information, including climate change projections, drivers, and trends, as well

⁶ Phase I Workbook, 20.4 Information Management, Worksheet 4b, Office of Disaster Preparedness and Management Response.

⁷ Phase I Workbook, 20.4 Information Management, Worksheet 4a, DNRE Response.

as agro-meteorological projections and seasonal outlooks. However, the drought and rainfall monitor contains merely a policy statement and the seasonal outlook page is unpopulated.

In addition, it appears that some institutions are moving toward the creation of official platforms for information sharing. For example, the MEAU indicated its intent to use a list of climate change focal points to develop a network where information could be shared. Additionally, the ODPM noted that its National Disaster Risk Reduction Committee (NDRRC) could be used as a platform to share information on climate change adaptation.

Trinidad and Tobago enacted the Freedom of Information Act in 1999. This Act gives “any person or organization the right to access information held by public authorities.” The Freedom of Information Act (FOIA) is implemented by the Freedom of Information Unit (FOIU), which is based within the Office of the Prime Minister. Access to information is requested by completing a Freedom of Information request form and through statements published by public authorities in the Trinidad and Tobago Gazette. The FOIA requires agencies to respond to FOIA requests within 30 calendar days and requires public authorities to advise FOIA applicants of their rights to appeal if not satisfied with the responses. The information management indicators for Trinidad and Tobago are evaluated in Table 4.

TABLE 4: INFORMATION MANAGEMENT INDICATORS FOR TRINIDAD AND TOBAGO

Indicator	Quality	Response (Yes / Limited / No)
There are systems for collecting and maintaining climate change adaptation-relevant data for the country.	Climate observation/monitoring systems are regularly maintained and updated with relevant data.	Limited
	Demographic information systems relevant to climate change are regularly maintained and updated as needed, including forecasts where possible.	No
	Environmental monitoring/observation systems are regularly maintained and updated as is relevant, including forecasts where possible.	Limited
	Methods for data gathering are made transparent and publicly available.	No
	Data are publicly available in raw form.	Limited
	Traditional and/or local climate knowledge and observations are gathered.	No
An institution (or institutions) has a mandate to analyze climate-adaptation-relevant information for the country in a	The institution(s) undergoes a regular, public process of review and revision of its approach to data analysis.	No

way that is useful for key stakeholder groups.	Sufficient budget is provided for ongoing information analysis.	No
	The status of vulnerable ecosystems and populations/communities is periodically analyzed.	No
	Climate scenarios are developed using all available projections and their uncertainty estimates.	No
There is an institution(s) in charge of centralizing climate change information and analysis that is stakeholder-driven and transparent	Priorities for analysis are set through a process of broad stakeholder consultation.	N/A—there is no centralization of climate change information
	Analysis is comprehensible to the public.	N/A
	There is consolidation and analysis of relevant climate information in the form of publicly available reports or online sources.	N/A
There is a platform or network for sharing information on adaptation to diverse information users.	There is a system for monitoring and evaluation of information dissemination, as well as revision of dissemination strategies.	N/A—no platform has been established and little information has been shared regarding climate change focal point networks
	Sufficient budget is provided for ongoing information dissemination.	N/A
	The mandated institution coordinates appropriately with other institutions.	N/A
	There is an efficient and fair means for individuals and organizations to demand climate-relevant information.	N/A

4.2.5 Mainstreaming

Despite multiple recent programs funded multilaterally to identify vulnerabilities and mainstream adaptation into policies, plans, or projects, there is sparse evidence to demonstrate that the mainstreaming of climate change adaptation is occurring in project development or sectoral planning, despite the emphasis in the CARICOM Regional Implementation Plan. There are no specific standards or systems for integrating climate change risk and adaptation into project development or critical sector planning though climate risk and adaptation measures are occasionally alluded to in projects. The Integrated Coastal Zone Management (ICZM) component of the IDB loan (mentioned above under Part

2, Prioritization) is viewed as the avenue to mainstream climate change adaptation into national policies, programs, and projects. Environmental impact assessments (EIA), which are handled by the EMA, occasionally refer to climate change impacts, but treatment is limited. The Town and Country Planning Act is the legal instrument for regulating land use in Trinidad and Tobago. However, there was no indication through available information on how climate change vulnerabilities are influencing land use policy.

In 2012, the EMA was given an IDB loan to strengthen its ability to fully perform its legally mandated coordinating role to mainstream the priorities set forth by climate change into environment and natural resources management in the context of all development sectors. This “Program to Support the Climate Change Agenda” has not produced identifiable institutional changes that have been disseminated to the public. The mainstreaming indicators for Trinidad and Tobago are evaluated in Table 5.

TABLE 5: MAINSTREAMING INDICATORS FOR TRINIDAD AND TOBAGO

Indicator	Indicator Quality	Response (Yes / Limited / No)
Are there systems for integrating climate change risk and adaptation into project development?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	No—although it may be happening in practice on an ad hoc basis in land use planning
Are there systems for integrating climate change risk and adaptation into planning of critical sectors?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	No—although this is expected to occur within the bounds of the ICZM
Are there systems for integrating climate change risk and adaptation into policies and programs?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	N/A—there is no system and this rarely occurs

4.2.6 Phase I Analysis

Although, Trinidad and Tobago has a recently elaborated climate change policy; committed to regional efforts to reduce climate vulnerability and engage the public; and given mandates to establish coordinating agencies around climate change adaptation, the ARIA assessment revealed that there are several areas that have not been implemented in practice. The lack of a national vulnerability assessment (as of 2013) means that there has not been a nationally coordinated process to engage the public, develop adaptation priorities, coordinate agency responsibilities, and share data and information. Specifically, disaster risk management and climate change adaptation more generally are coordinated through different agencies and the level of coordination between these agencies is uncertain.

While Trinidad and Tobago has enacted a Freedom of Information Act to make information available upon request, systems to make climate change information available proactively in formats that are useable and relevant are essential to inform and engage the public, including vulnerable groups, in decision-making. This information can be made available directly to communities and through civil society intermediaries. However, no platform to gather and disseminate climate change information has

been established at the national level. This limits public awareness, its ability to meaningfully contribute to national climate policy, and to hold decision-makers accountable.

The ICZM is the first notable effort to mainstream climate change adaptation and preparedness into sectoral planning and decision-making. This effort was launching in 2013 and should be monitored to be potentially replicated for other sectors.

4.3 Selection of Priority Areas

Following the Phase I research, CANARI organized a workshop that included civil society and public sector representatives. The researchers and participants in the Phase I review workshop decided to base the selection of the three areas for Phase II on the sectors which provided the best opportunities to input into ongoing climate change processes in Trinidad and Tobago. The criteria used were:

- the need for advocacy to effect action on adaptation in the sector
- ongoing research or advocacy that would provide opportunities for intervention
- existing and accessible information

The priority areas identified in Trinidad and Tobago were: (i) coastal zones of Trinidad and Tobago; (ii) food production; and (iii) tourism, with the rationale provided below:

Coastal zones: Under the *IDB/GORTT Program to Support the Climate Change Agenda I*, the Integrated Coastal Zone Management component appeared to be the one that is solely focused on climate change adaptation. The aim of the Program is to support Trinidad and Tobago in strengthening and modernizing the regulatory, institutional and policy framework to integrate climate change and its impacts into national economic development. Coastal zone management is an area in which work was underway, which increased the likelihood of available information.

Food production: While agriculture contributes less than 5% to Trinidad and Tobago's GDP, loss of food production is expected to have a disparate impact on vulnerable groups whose livelihoods depend in part on subsistence farming or small-holder agriculture. Rising food prices and dependence on imported food were also identified as concerns. Additionally, a recent study by the ECLAC provided an opportunity for input on the issue in a policy arena.

Tourism: Tourism in Trinidad and Tobago, while not as predominant a contributor to GDP as in Saint Lucia, is an important part of the economy and is intricately linked to coastal infrastructure, marine ecosystems, and coral reefs. Workshop participants indicated that advocacy was needed for this sector.

4.4 Priority Area: Coastal zones

Trinidad and Tobago's coastal zone supports a wide range of ecological and socioeconomic services. It provides for coastal ecosystems such as mangroves, seagrass beds, coral reefs, and beaches, which in turn attract tourism, provide habitat for marine life and help buffer against storm surges and regulate floods, amongst other benefits. The coastal zone is also where oil and gas production occurs—the main

economic activity of the islands. The coastal zone also supports local community livelihoods through farming and fishing. A 2010 report by Trinidad and Tobago's Institute of Marine Affairs estimated that 70% of nation's population lives in the coastal zone.^{xxvi}

Based on these biophysical characteristics and socioeconomic importance, the GORTT identified coastal zones as one six priority sectors for adaptation. Climate change driven impacts, such as sea-level rise, more intense storms and hurricanes and ocean acidification, are projected to have significant adverse effects on the Caribbean region's coastal zones; most of which are already under pressure from increased coastal development and pollution. The GORTT has already identified coastal erosion as a major impact that is affecting infrastructure, beaches, ecological habitat, and farms. These adverse effects, together with the range of economic and environmental benefits provided by the coastal zone, necessitate the establishment of effective management strategies that would promote the sustainability and resilience of coastal resources and populations.

For many years, Trinidad and Tobago did not have a formal coastal zone management plan. In April 2012, however, the country took its first steps toward addressing this critical gap in management by establishing a National Steering Committee on Integrated Coastal Zone Management. The Cabinet appointed Steering Committee, which is chaired by the Institute of Marine Affairs (IMA), is mandated to recommend a national policy framework, strategy and action plan that would build the foundation for a permanent coastal zone management function in the country.^{xxvii} As part of its work, the Committee will also focus on climate change adaptation in the coastal zone.

4.4.1 Vulnerability and Impacts Assessments

Overall, there does not appear to be a comprehensive national assessment regarding the vulnerability of coastal zones arising from climate change impacts. In its Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC), the EMA briefly identified certain coastal areas in Trinidad and Tobago that were experiencing high rates of erosion and hence vulnerable to climate change driven sea-level rise. The SNC also made reference to vulnerability assessments conducted by the Petroleum Company of Trinidad and Tobago. Unfortunately, copies of these reports could not be found online for more detailed review.

With respect to ongoing assessments, a National Steering Committee on ICZM was created in April 2012 and mandated by Cabinet to recommend a national policy framework, strategy and action plan that would build the foundation for a permanent coastal zone management function in the country.^{xxviii} The Steering Committee, chaired by the IMA, has organized its work around five thematic areas:

- social and economic development;
- natural resource assessment;
- vulnerability assessment and climate change adaptation;
- public outreach, education and awareness and
- legal and institutional assessment (IDB, 2013)

The chairman of the ICZM Steering Committee indicated that a report on coastal vulnerability and climate change adaptation in Trinidad and Tobago was recently completed by the appointed working group.^{xxix} The report, which was prepared by using existing data, was informed by the Trinidad and Tobago Meteorological Office (TTMS), the Office of Disaster Preparedness and Management (ODPM) and the Water Resources Agency. Unfortunately, during the time this study was being conducted, the report was still in the process of being reviewed and therefore was not yet available for public circulation.

4.4.2 Prioritization

The GORTT intends to utilize a participatory approach in the development of a national policy framework, strategy and action plan for integrated coastal zone management in Trinidad and Tobago, which as mentioned before, includes considerations for climate change adaptation. The GORTT received approval by the Inter-American Development Bank (IDB) for the financing of a Technical Cooperation project “*Feasibility studies for a risk resilient coastal zone management program (TT-T1038)*” that will assist with the development of the national ICZM strategy. The Cabinet appointed National ICZM Steering Committee also serves as the Technical Advisory Committee for the IDB project.

Regarding the process for sequencing adaptation activities, the Technical Cooperation document indicates, that in developing the proposed ICZM policy framework, the Steering Committee will be supported by experts to provide the quantitative justification and rationale for its establishment. This will be done through the conduct of a variety of technical assessments and studies. Priorities will then be set based on the findings of these studies and assessments and an action plan will be drafted.^{xxx} The Technical Cooperation will then finance public awareness and consultation activities for the proposed Policy Framework, to ensure meaningful engagement of stakeholders (including private sector actors with economic interest in the coastal zone, civil society groups, and relevant government agencies) in both Trinidad and Tobago.

The work of the national ICZM Steering Committee receives budgetary support from the Inter-American Development Bank as well as recurring funding under the IMA. The GORTT received approval by the IDB for a non-reimbursable grant in the amount of five-hundred thousand United States dollars (US\$500,000.00) to, *inter alia*, help support the work of the ICZM Committee. However, there is no national budgeting for the Steering Committee at this time.

4.4.3 Coordination

The work of the National ICZM Steering Committee represents the most significant efforts at coordination and collaboration regarding climate change adaptation for the coastal zone. The ICZM Steering Committee is a multi-sectoral committee comprised of twelve (12) members from various government ministries, state agencies and civil society with an interest in the coastal zone and how it is managed. Members include representatives from the Ministry of Environment and Water Resources, Ministry of Tourism, Forestry Division, Institute of Marine Affairs (IMA), Environmental Management Authority (EMA), Fisheries Division, Ministry of Works and Infrastructure, Maritime Services Division, Tobago House of Assembly (THA), Town and Country Planning Division (TCPD), Ministry of National Security, Ministry of Energy and one civil society representative from the Council of Presidents of the Environment (COPE).

4.4.4 Information Management

The Trinidad and Tobago Meteorological Service (TTMS) makes climate relevant data available, and in a usable format, to key stakeholders in the sector upon request. Data includes rainfall, temperature and wind. However, there is no apparent database on storm surge, coastal erosion, or other pertinent data linked to climate change.

There is currently no platform for the exchange of climate information on the national level. However, one of the expected outputs for the IDB Technical Cooperation project “*Feasibility studies for a risk*

resilient coastal zone management program (TT-T1038)” is the drafting of a Terms of Reference for the design of an integrated national coastal risk information platform.

4.4.5 Mainstreaming climate change in coastal zone management

There is currently no formal process or procedure for integrating climate change risk and adaptation into projects or sectoral planning. However, the GORTT received financing from the IDB for the institutional strengthening of the Environmental Management Authority (EMA) of Trinidad and Tobago to improve its coordinating role in mainstreaming environmental management and climate change related priorities into all development sectors. The purpose of the project is to contribute to the implementation of the mitigation and adaptation agendas for the country.^{xxxix} This includes *inter alia*:

- Support with technical and legal expertise to integrate environmental aspects related to climate change vulnerability, deforestation, erosion and other impacts and adaptation into national development plans and building codes.
- Preparation of a proposal to harmonize the Certificate of Environmental Clearance (CEC) Rules among other supporting regulations to consider greenhouse gas (GHG) emissions.

Additionally, the IDB funded Technical Cooperation project will include a series of capacity building workshops for the network of agencies active in Integrated Coastal Zone Management, including the agencies represented in the National ICZM Steering Committee. The workshops will focus on recent trends in ICZM, including the integration of disaster risk management and climate change adaptation.

Whereas a comprehensive report on the barriers to climate change adaptation in the coastal zone for Trinidad and Tobago does not currently exist, the Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC), identifies certain technical skill and policy gaps that need to be addressed to effectively deal with issues related to climate change on a national level and within specific priority areas.^{xxxix}

4.4.6 Analysis

The GORTT has identified coastal zone areas as a priority area for climate change adaptation, but a comprehensive assessment of vulnerabilities had yet to be completed at the time of research. Still, with the creation of the Integrated Coastal Zone Management Committee, this sector is strengthening institutions to conduct assessments, develop adaptation priorities, coordinate across agencies and sectors, manage climate information, and mainstreaming into land use planning, infrastructure, and development activities. The ICZM Steering Committee’s membership that cuts across sectors and agencies along with a clear set of priorities may help it generate greater public participation in coastal zone adaptation while building buy-in with key stakeholders. Unlike at the national level, this sector demonstrated vertical, horizontal and cross-sectoral coordination, even if it’s in early stages.

The lack of a platform to collect and manage climate adaptation-relevant data was also reflected at the sectoral level, where the only publicly available data is through the Trinidad and Tobago Meteorological Service. While formal processes for mainstreaming do not currently exist, the EMA should consider climate change risks when assessing EIA for coastal zones. Building adaptive capacity to coastal flooding events will also require effective implementation of rules and regulations to limit pollution, protect mangroves and reefs, and ensure that coastal development is balanced with ecosystem services. Ultimately, the ICZM could provide for mainstreaming adaptation planning and resilience considerations

into coastal development, socioeconomic programs for coastal communities, ecosystem protection, and safety regulations around oil and gas development.

4.5 Priority Area: Food Production

According to the Ministry of Planning and Sustainable Development's Medium-Term Policy Framework 2011-2014, Agriculture and Food Security are strategic priorities for the GORTT. The GORTT has also outlined the following nine (9) strategic initiatives for the sector:

- Increase agricultural production, distribution and access.
- Develop a water resources management strategy
- Improve land management and the tenure of farmers
- Expand source markets for imports
- Encourage youth participation in the agriculture sector
- Encourage higher levels of productivity for locally produced goods
- Encourage the consumption of healthy, locally produced food
- Create linkages between agriculture and other productive sectors
- Effectively monitor prices and movement of inflation^{xxxiii}

Notably, none of these strategic initiatives specifically identify climate change adaptation, or resilience as an outcome. However, adaptation considerations could still be mainstreamed within these strategic priorities. For example, food security, defined by the World Health Organization as three pillars—availability, access, and use—clearly overlaps with adaptation concerns around food production and equitable access.^{xxxiv} Food production will continue to be impacted by reduced agricultural yields caused by (among other factors) increases in extreme weather events and unpredictable seasons brought on by climate change. Loss of traditional livelihoods may impact food access. Climate change will also have a significant impact on water resources; hence, the strategic initiative to develop a water resources management strategy can also be effective in terms of climate adaptation, provided that the strategy specifically formulates actions to address reduced water supplies brought on by drought and reductions in seasonal rainfall. Overall however, it was found that implementing adaptive measures to deal specifically with climate change is not currently a strategic focus for the Ministry of Food production in Trinidad and Tobago.

4.5.1 Vulnerability and Impact assessments

The findings of this study reveal that only one vulnerability and impact assessment, undertaken by the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), currently exists for the food production sector. UNECLAC undertook an assessment of the *Economic Impact of Climate Change on Agriculture in Trinidad and Tobago (2011)* as part of a larger regional project to review the economics of climate change in the Caribbean.^{xxxv}

The UNECLAC assessment uses climate model scenarios to project the economic impacts of climate change on agriculture that would result from sea-level rise, rain fall variability, increased temperatures and declining fish catch. Brief consideration is given to the impacts that these changes would have on livelihoods, food security and human health.

The report makes a series of recommendations for potential climate change adaptation strategies. Each strategy is ranked on a weighted scale according to the following evaluation criteria: low cost, effectiveness, acceptance to stakeholders, endorsement by experts, short timeframe, institutional capacity, size of beneficiary group, ease of implementation, adequacy for current climate, potential positive social/environmental impact and potential to sustain over time. Some of the recommended strategies are intentionally aligned with established national priorities for the sector.

It is, however, unclear, whether the report was used to guide the Ministry of Food Production’s Strategic Plan 2011-2015 and the National Food Production Action Plan 2012-2015, as reference to the assessment could not be found in either document.

4.5.2 Prioritization

The Ministry of Food Production has not specifically addressed climate change adaptation in its current four-year strategic plan. However, there are several multi-year initiatives (described in Table 6 below) that could have ancillary adaptive capacity-building benefits. Other efforts to improve food security and mitigate against price shocks include greenhouse, irrigation and aquaculture initiatives. ,

Budget processes

Finance is available for projects through annual national budgetary allocations under the Public Sector Investment Program (PSIP) and from international financing agencies. Table 6 lists the current climate change adaptation related initiatives being undertaken by the Ministry of Food Production and their respective budgetary allocations (Ministry of Planning and Sustainable Development, 2012).

TABLE 6: PROJECTS BEING UNDERTAKEN BY THE MINISTRY OF FOOD PRODUCTION RELEVANT TO CLIMATE CHANGE ADAPTATION

Project	Budgetary Allocation	Financing Institution
Water Management and Flood Control Program – the objective of the Program is to increase farm output and income through improved water management infrastructure (Ministry of Planning and Sustainable Development, 2012).	TT\$554M	Government- Public Sector Investment Program (PSIP)
Accelerated Pond Construction Program - is intended to provide on-farm water storage via the construction of irrigation ponds in the agricultural food baskets of Trinidad; thereby increasing agricultural production particularly in times of water shortages and droughts. The scope of works of the Program involves the construction of	TT\$82M	Government-Public Sector Investment Program (PSIP)

2,349 ponds during 2011-2015 (Ministry of Planning and Sustainable Development, 2012).

<p>Water Management and Irrigation Assessment and Development on the Felicity Site, Central Trinidad - the European Union (EU) recently financed this project which was implemented with the Ministry of Food Production and the Water and Sewerage Authority (WASA). The project assessed the options for the irrigated agriculture and drainage in Felicity and developed detailed plans to address the gaps identified. This project considered the impacts of climate change (European Commission, 2012).</p>	<p>€190,610.00</p>	<p>European Union (EU)</p>
<p>Demonstrative Projects – Protected Agricultural Production (NAMDEVCO)- This project involves demonstration in the use of green house and irrigation technologies to increase the supply of fresh agricultural produce. It also involves the establishment of efficient distribution systems in the shortest possible time that will even out the fluctuations in supply and allow for steady and reasonable prices to both producers and consumers (Ministry of Planning and Sustainable Development, 2013).</p>	<p>TT\$8.2M</p>	<p>Government -Public Sector Investment Program (PSIP)</p>
<p>Community Based Aquaculture Program -will establish a model aquaculture farm for training, field testing and demonstration purposes at Bamboo Grove (Ministry of Planning and Sustainable Development, 2012).</p>	<p>TT\$3M</p>	<p>Government -Public Sector Investment Program (PSIP)</p>

4.5.3 Coordination

The Ministry of Food Production is included in the national coordination efforts of the National Integrated Coastal Zone Management (ICZM) Steering Committee. The Ministry is represented on this Committee by the Fisheries Division. Although most of the current work being undertaken by the

Ministry for the fishing sub-sector is related to the improvement and provision of fishing infrastructure, the involvement of the Fisheries Division on the ICZM Committee can likely bring awareness, through vulnerability assessments, to issues of climate change adaptation and the fisheries sub-sector which may then lead to deliberate action by the Ministry.

The Ministry of Food Production also collaborates with regional institutions such as the Caribbean Agricultural Research and Development Institute (CARDI) and the Inter-American Institute for Cooperation on Agriculture (IICA). Both organizations have offices in Trinidad and Tobago that provide technical cooperation and expertise to the Ministry and its affiliated government agencies. In terms of climate change related initiatives, the Ministry is currently involved in a regional project “Improving Caribbean Food Security in the context of Climate Change” being implemented by CARDI. The Caribbean Industrial Research Institute (CARIRI) also entered a technical cooperation agreement with CARDI in 2013 to identify cultivars more resistant to extreme weather.

The Caribbean Institute for Meteorology and Hydrology (CIMH), the Trinidad and Tobago Meteorological Services and CARDI also collaborated to launch an agro-meteorological service for farmers in Trinidad and Tobago under CIMH’s regional Caribbean Agro-meteorological Initiative (CAMI) project. The objective of the project, which was launched in 2010, was to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved dissemination and application of weather and climate information using an integrated and coordinated approach (CIMH, 2010). CAMI is funded by the European Union.

4.5.4 Information Management

The Trinidad and Tobago Meteorological Service (TTMS) makes climate relevant data available and in a usable format to key stakeholders in the food production sector upon request. Data includes rainfall, temperature and wind. The TTMS also has an agro-meteorological service which provides farmers with forecasting information for different regions on both islands. This information is accessible directly from the TTMS’ website.

4.5.5 Mainstreaming

There is currently no formal process or procedure for integrating climate change risk and adaptation into projects or sectoral planning. However, the GORTT received financing from the Inter-American Development Bank (IDB) for a Technical Cooperation to undertake the institutional strengthening of the Environmental Management Authority (EMA) of Trinidad and Tobago in order to improve its coordinating role in mainstreaming environmental management and climate change related priorities into all development sectors. The purpose of the program is to contribute to the implementation of the mitigation and the adaptation agendas for the country.

The Technical Cooperation includes:

- Support with technical and legal expertise to integrate environmental aspects related to climate change vulnerability, deforestation, erosion and other impacts and adaptation into national development plans and building codes.
- Preparation of a proposal to harmonize the Certificate of Environmental Clearance (CEC) Rules, among other supporting regulations, to consider Green House Gas (GHG) emissions.

4.5.6 Analysis

The Ministry of Food Production has created strategic priorities which may increase adaptive capacity to climate change for country's food production. Market diversification, flood control and water management, and land tenure may help buffer against climate change impacts to food production brought about by rising temperatures, less predictable rainfall, drought, or flooding. However, food production strategies should directly assess and consider how these impacts are likely to affect food production and make the process on how these considerations are included in strategy and planning transparent to the public. Also, it is not apparent that the Ministry of Food Production has considered the ECLAC vulnerability assessment on the food sector in its planning. A more comprehensive vulnerability and adaptation assessment with special consideration of vulnerable groups would strengthen institutional readiness. The Ministry of Food Production did consult with a wide range of public, private, and civil society stakeholders in the development on its strategic plan.

The collaboration with regional research institutes such as CARDI and the inclusion on the ICZM Steering Committee suggests that coordination and information sharing is occurring for the food production sector. Agro-meteorological bulletins and forecasts were up to date when checked on the Trinidad and Tobago Meteorological Services website. However, additional information related to agricultural markets, fish stocks, and crop conditions, would improve the quality of info for users.

Trinidad and Tobago currently does not have an established inventory of current and past projects with climate change adaptation benefits in the food production sector. This can help increase learning and coordination and avoid past mistakes. This inventory, along with a vulnerability assessment, can help inform a prioritization process for vulnerability reduction that includes key stakeholders. Finally an assessment of barriers to adaptation in the food sector, whether financial, infrastructural, institutional, or otherwise would help in future planning efforts.

4.6 Priority Area: Tourism

Tourism in Trinidad and Tobago, like much of the Caribbean, relies significantly on the use of natural resources. According to the World Travel and Tourism Council, tourism accounted for 7% of total GDP in 2011 and 9.3% of total employment.^{xxxvi} With the impacts of climate change already affecting many tourism dependent islands in the Caribbean - adaptation is critical. Climate change driven impacts such as beach erosion resulting from sea-level rise, destruction of important coastal tourism businesses and infrastructure caused by more intense storms and hurricanes and unpredictable seasons will all negatively impact the tourism product of the Caribbean. Strategic actions therefore need to be undertaken at the national level to create an enabling environment for the tourism sector to adapt to climate change. In addition, given the inter-sectoral and fragmented nature of the tourism industry these actions will have to be properly coordinated across all sectors, industries and business if they are to be impactful.

While the strategic priorities for the tourism sector, as outlined in GORTT's Medium Term Policy Framework 2011-2014, do not identify climate adaptation of the sector specifically, it is clear that the GORTT recognized the threat of climate change to the tourism industry in the drafting of the 2010 National Tourism Policy of Trinidad and Tobago. The National Tourism Policy acknowledges that:

“The need to reduce global emissions of green-house gases is both urgent and critical if we are to avoid dangerous effects of climate change such as beach erosion, coral bleaching, water and food shortages, ecosystem collapse, sea-level rise, extreme weather events and potentially catastrophic “run-away” global heating.”^{xxxvii}

In response to this, the Policy outlines some of the following actions relevant to tackling the issues of climate change and global warming.

1. Ensure the conduct of Environmental Impact Assessments and obtaining of Certificates of Environmental Clearance, as necessary;
2. Support the development of a national carbon reduction scheme to offset Trinidad and Tobago’s contribution towards global warming;
3. Encourage and promote the adoption of state-of-the-art methods, practices and technologies to ensure the sustainable growth of the tourism industry and the negative impacts of global warming and climate change;
4. Encourage the adoption of energy saving and other environmental best practices;
5. Develop and implement effective risk assessment and crisis management strategies to deal with any of the symptoms of climate change and other natural disasters.

Although these actions are helpful in the way of promoting climate mitigation and sustainable use of the natural resource base upon which tourism depends in Trinidad and Tobago, deliberate actions, strategies, plans and projects must also be undertaken to fully ensure that the sector will adapt to climate change.

4.6.1 Vulnerability and Impacts Assessment

No vulnerability and impact assessment to climate change for the tourism sector in Trinidad and Tobago currently exists. However, CARIBSAVE, a regional non-governmental organization, has recently been awarded a project through the United Nations Environment Programme (UNEP) to conduct vulnerability, impact and adaptation analyses in three (3) Caribbean countries. CARIBSAVE works with stakeholders to address the impacts and challenges surrounding climate change, the environment, economic development, tourism, and community livelihoods. At the time of research, this initiative was accepting formal requests from countries for the technical assistance to undertake the project.^{xxxviii} Once the MOEWR submits the request, an assessment of tourism, water resources and coastal areas will be undertaken.^{xxxix}

4.6.2 Prioritization

There are no specific activities geared toward climate change adaptation currently being implemented by the Ministry of Tourism or the Tourism Development Company (TDC).

Although climate change adaptation initiatives are not currently being undertaken by the TDC or the Ministry of Tourism, there are other environmental initiatives for which funding is provided through national budgetary allocations under the Public Sector Investment Program (PSIP). It was however

indicated that the specific budgetary allocation for the TDC to undertake environmental initiatives for the 2014 fiscal year was less than requested.^{xi}

4.6.3 Coordination

The Ministry of Tourism is represented on the National ICZM Steering Committee. The multi-sectoral Committee is comprised of various government ministries and agencies, in addition to a civil society representative. The coastal zone in Trinidad and Tobago represents a significant component of the national tourism product. As a member of the Committee, the Ministry benefits from the information received on ICZM. It is intended that this information can be passed on to stakeholders and guide projects developed to assist the tourism industry.^{xii}

In terms of their regular processes, the TDC coordinates with the Regional Corporations under the Ministry of Local Government and the Tobago House of Assembly (THA) as necessary to undertake activities regarding the management of beaches on the islands. They also work closely with community based organizations.

On the regional and global levels, Trinidad and Tobago is a member of the Caribbean Tourism Organization (CTO) and the United Nations World Tourism Organization (UNWTO). In addition to marketing support, these organizations provide technical support in terms of compiling and making available tourism statistics.

4.6.4 Information Management

The Trinidad and Tobago Meteorological Service (TTMS) makes climate relevant data available and in a usable format to key stakeholders in all sectors upon request. Data includes rainfall, temperature and wind.

4.6.5 Mainstreaming

There are no processes to mainstream climate change adaptation into the projects and plans other than institutional strengthening of the EMA that was previously mentioned.

4.6.6 Analysis

The assessment of the tourism sector found that there is little institutional readiness around climate change adaptation, with there being no vulnerability assessment, prioritization activities, fragmented coordination, and no clear efforts to integrate adaptation in sectoral policy and planning. The 2010 National Tourism Policy does recognize climate change adaptation as a threat, but does little more than superficial treatment of the issue. More research, coordination, and institutional strengthening appears to be needed.

4.7 Saint Lucia

Saint Lucia is a Small Island Developing State (SIDS) that covers 616 sq. km with an estimated 2013 population of 181,000 and a 2012 GDP of \$1.24 billion.^{xlii} The majority of the population resides in coastal areas. It is largely dependent on agriculture and tourism, making it vulnerable to exogenous economic shocks and shifts in international trade.^{xliii} The UNDP Human Development Index ranked Saint Lucia 88th of 187 countries—within the “High Human Development” category.^{xliv}

Saint Lucia’s Strategic Program on Climate Resilience identified systemic vulnerabilities to climate change including: exposure to tropical storms and hurricanes, small geographical size, economic reliance on vulnerable sectors (agriculture and tourism), and fragile ecosystems.^{xlv} As an example, UNECLAC estimated the total cost of Hurricane Tomas in 2010 to be equivalent to 43% of Saint Lucia’s GDP.^{xlvi} Drought conditions the previous year were the worst in 40 years and exposed island-wide vulnerabilities in freshwater storage.^{xlvii} Detailed climate modeling projects that Saint Lucia is exposed to temperature increases, reduced average annual rainfall, increased sea surface temperature, and more intense tropical storms.^{xlviii}

The Saint Lucia Labour Party was elected to government in 2011 and realigned environmental agencies under the Ministry of Sustainable Development, Energy, Science, and Technology, which includes the Forestry Department, Water Resources Management Agency, Biodiversity Unit, Public Utilities Unit, and Science and Technology Unit. At the same time, Saint Lucia embarked on the Pilot Program for Climate Resilience (PPCR), the first effort to implement adaptation planning comprehensively, in multiple sectors, across the country. Currently under development are a national development plan, which is expected to coordinate with the PPCR, and major environmental legislation on climate change.

The PPCR, which is funded by Climate Investment Funds, is intended to provide programmatic finance for national climate resilient development plans. “*The PPCR aims to provide transformational, catalytic, and scaled-up support for both development and implementation of climate-related plans.*”^{xlix} It is being implemented by the Ministry of Sustainable Development, Energy, Science, and Technology along with the Ministry of Finance and Economic Affairs, which is the climate change focal point for Saint Lucia. In Phase I of the PPCR, the National Climate Change Policy and Action Plan (NCCPAP) was updated in 2013 and the Strategic Program on Climate Resilience was drafted (SPCR). As part of the SPCR, the Government of Saint Lucia committed to “mainstreaming and integrating climate change into the national budget, written and unwritten policies, fiscal incentives and regimes, development programs, plans, strategies, codes, procedures, processes, legislation, and enforcement”.^l

During Phase I, the SPCR is identifying gaps and constraints in laws, regulations and policies to building climate resilience. In Phase II, it is committed to creating legislative mandates to “facilitate and coordinate the implementation of adaptation measures across sectors and agencies. A few of the expected outcomes of the SPCR relevant to this project are, *inter alia*:

- A robust and effective policy, legislative and fiscal framework for the building of climate resilience established;
- Public, private and civil society actors more informed, educated and empowered to contribute to national climate resilience-building;
- National Capacity for climate-relevant research and systematic observation, data acquisition, management, analysis and sharing enhanced

The SPCR also acknowledges that current information collection, management, and dissemination is inadequate for climate change adaptation decision-making and seeks to strengthen these systems.^{li}

The NCCPAP includes the following:

Local capacity will be strengthened in the areas of environmental assessment and management, modelling, economic and social development planning related to climate change, and adaptation. These objectives will be pursued through the application of participatory approaches to capacity building and institutional change.^{lii}

The NCCPAP dedicates a section to the facilitation of adaptation measures and developing an enabling environment—a central theme to the ARIA assessments. It calls for improved governance, institutional strengthening, and partnerships with civil society and the private sector.

In 2011, a workshop convened by CANARI in Saint Lucia for civil society groups produced a “Civil society agenda to address the impacts of climate change”^{liii}. Participants in the workshop identified six priority areas for action: freshwater resources, infrastructure resilience, food security, biodiversity, coastal and marine resources, and livelihoods and culture. The ARIA Phase II workshop built off of this process and selected priority areas from those which had been identified at this workshop.

4.8 Findings

National Overview (Phase I)

4.8.1 Vulnerability and Impacts Assessment

A vulnerability and impacts assessment was conducted in preparation for the Second National Communications to the UNFCCC. The assessment included agriculture and food security, coastal sector, critical infrastructure, human settlements and population distribution, forest and marine biodiversity, tourism, financial services sector, health, and disaster management. It was limited in its evaluation of socioeconomic vulnerabilities. Issues of governance, social stratification, and gender impacts were not examined in detail. The methods for assessing both impacts and vulnerability are made transparent through the Initial and Second National Communications reports which are publicly available from the SDED on request, disseminated and generally written in accessible language. According to documents and interviews, a wide range of civil society was invited to consultations for the national communications as well as to the PPCR process. However, while a sub-national assessment was conducted for the Vieux Fort area, this assessment was not referred to in the National Communications.

Although not strictly required to produce vulnerability and impacts assessments as part of the UNFCCC reporting process, the NCCPAP calls for regular assessment of impacts and vulnerabilities. According to interviews, there is a structured process to provide accountability. The report on vulnerability and adaptation is presented to the National Climate Change Committee which is a duly appointed Cabinet Committee as part of the National Communications on Climate Change for the UNFCCC. Political ownership of the process was created through the PPCR where external funding had to be sought from the World Bank to implement the adaptation projects under the PPCR and Disaster Vulnerability Reduction Program (DVRP) which stemmed from the vulnerability assessment studies. According to the NCPAP, the NCCC is to report to the Cabinet of Ministers on a semi-annual basis and to prepare an annual report for presentation to the Cabinet. Efforts are coordinated through the UNFCCC reporting consultation process.

The SPCR may represent the most participatory climate change adaptation process to take place. Nearly 500 people were surveyed, the results of which will inform the public awareness and education plan. The assessment indicators for Saint Lucia are evaluated in Table 8.

TABLE 7: ASSESSMENT INDICATORS FOR SAINT LUCIA

Indicator	Indicator quality	Response (Yes / Limited / No)
Is there a comprehensive assessment of vulnerability and impacts at the national level? If not, and only sub-national or sectoral assessments exist, review these using a worksheet for each assessment.	Assessment(s) include(s) socioeconomic and political drivers of vulnerability.	Limited
	Assessment methodology is made transparent.	Yes
	Broad set of stakeholders were engaged in assessment development.	Yes
	Assessment (if national) includes review of existing sub-national assessments, including community-based assessments.	Limited
	Assessment(s) covers all sectors and regions.	Limited
	Assessment(s) includes exposure to climate	Yes
Is there an inventory of existing adaptation efforts nationally? If not, and only sub-national or sectoral inventories exist, review these using a worksheet for each inventory.	(No qualities for this indicator)	Yes—as part of the PPCR
An institution (or institutions) has/have a mandate to produce a vulnerability and impacts assessment and/or a national inventory of adaptation efforts iteratively over time.	The mandated institution reports to an appropriate authority.	Yes
	The mandated institution coordinates appropriately with other institutions.	Yes
	Sufficient budget is provided for ongoing assessments.	Limited
	Staff carrying out assessment has sufficient skill and knowledge.	Yes

4.8.2 Prioritization

The process for identifying priority sectors occurred through national consultation with relevant stakeholders. During this process stakeholders identified sectors which they deemed relevant to be assessed and sectors considered important for national socio-economic development. As a result, seven priority sectors were addressed in the Initial National Communications and ten sectors were addressed in the Second National Communications. The priorities included geographies, sectors, ecosystems, and infrastructure.

Documents pertaining to the prioritization process are available in hard copies, though not on the internet. The results of the process were disseminated, though the structure and process for deciding on the priorities were not made available. The costs and benefits of different adaptation options were considered in the development of the priorities.

Budgetary processes, while overall graded highly by researchers for alignment and effective allocation, should be made more easily available to the public. Currently, the public must pay to purchase national budget reports. In addition, climate change policy documents are not available on the Ministry's website.

There currently is no set process for revisiting priorities. The prioritization indicators for Saint Lucia are evaluated in Table 9.

TABLE 8: PRIORITIZATION INDICATORS FOR SAINT LUCIA

Indicator	Indicator Quality	Response (Yes / Limited / No)
There is a process for identification of priority populations, geographies, or sectors for adaptation in the country. If multiple processes exist in different institutions, describe the process (or lack of) coordination and integration of priorities.	Identification of priorities considers critical sectors, geographic regions, vulnerable populations, ecosystems, and infrastructure.	Yes
	Process for identification of priorities is transparent and publicly available.	Limited
	Broad set of stakeholders were engaged in identification process— including vulnerable and marginalized groups – in order to assure that priorities are informed by a broad range of perspectives.	Yes
	Institutional needs are identified in relevant general planning documents, such as sectoral strategies or regional development plans.	Yes
	Prioritization uses cost-benefit analysis that is stakeholder-driven.	Limited

Budgetary processes exist to channel finance to adaptation institutions.	Budgetary priorities reflect priorities for adaptation described in strategic documents.	Yes
	Funds effectively appropriated.	Limited
	Budgetary institutions able to effectively centralize international finance.	Yes
	Budgetary processes meet international standards for transparency and participation.	No
A time period and process have been set for revisiting priorities set forth in official prioritization decisions.		N/A—There is no process for revisiting priorities

4.8.3 Coordination

Although, the Sustainable Development and Environment Division has been tasked with the responsibility of coordinating climate change adaptation efforts, no coordination needs have yet been publicly identified. The National Climate Change Committee (NCCC) has been appointed by the cabinet to oversee implementation of adaptation priorities across the government as provided for in the National Climate Change Policy and Action Plan (NCCPAP). The Committee, which meets four times a year, includes a wide range of government representation as well as members from the private and public sectors. However, there is no public accountability mechanism to force the NCCC to fulfill its mandate. Even though interviews suggest that the NCCC is viewed favorably, interviewees urged participating members to do more to communicate climate change impacts and adaptation strategies to their members.

The coordination indicators for Saint Lucia are evaluated in Table 10.

TABLE 9: COORDINATION INDICATORS FOR SAINT LUCIA

Indicator	Indicator Quality	Response (Yes / Limited / No)
Coordination needs for effective adaptation have been identified and made publicly available.	Vertical coordination needs have been considered and are described in a publicly available document.	N/A—coordination needs have not been identified
	Coordination needs across sectors and ministries have been considered and are described in a publicly available document.	N/A
There is an established, coordinating body or council tasked with adaptation	The coordination body has a clear mandate and reports to an appropriate authority.	Yes

coordination.

Sufficient resources have been appropriated for coordination activities. Limited

Coordination body has appropriate membership and skill sets. Yes

There is a system for monitoring and review of the coordination process. Yes

The public has mechanisms to ensure that actions for coordination have been undertaken. No

To what extent is the coordinating body functioning effectively?

The coordinating body meets with enough regularity to effectively maintain coordination. Limited

Findings from coordination reviews are adopted by relevant agencies. Limited

Coordinating body participants indicate that coordination has and continues to improve. Limited

4.8.4 Information Management

Climate monitoring, analysis, and dissemination systems exist, however they are not being maintained or functioning to be useful. The Saint Lucia Meteorological Services website (www.slumet.gov.lc) was out of date and not working properly when evaluated during the project period. Temperature measurement instruments for the Water Resources Management Agency were not functioning during the time of the project. Raw and analyzed data on environmental pressures and quality are not readily available online and must be sought out at the agency. However, Saint Lucia does not have a Right to Information law, so this access is not legally protected. Demographic data are easier to access, having been made available online by the Central Statistics Office.⁸

The Government of Saint Lucia completed its Second National Communications to the UNFCCC in 2011, which included a vulnerability assessment and updated climate impact projections for the country. The process, according to the government involved consultations with NGOs and communities, however, there is no document detailing this process and the feedback received. It's therefore unclear how non-governmental stakeholders were able to inform or influence the process. According to respondents from the Sustainable Development and Environmental Division, the consultations for the National Communications to the UNFCCC primarily consisted of government and private sector stakeholders, while the PPCR included more civil society.

⁸ Accessed May, 2014: <http://204.188.173.139:9090/stats/>

While a website for dissemination of climate change information exists⁹, it was not up to date during the time of research. Information dissemination activities are not regularly funded and occur at the discretion of the relevant Ministry because Saint Lucia has yet to pass information legislation. The information management indicators for Saint Lucia are evaluated in Table 11.

TABLE 10: INFORMATION MANAGEMENT INDICATORS FOR SAINT LUCIA

Indicator	Quality	Response (Yes / Limited / No)
There are systems for collecting and maintaining climate change adaptation-relevant data for the country.	Climate observation/monitoring systems are regularly maintained and updated with relevant data.	Limited
	Demographic information systems relevant to climate change are regularly maintained and updated as needed, including forecasts where possible.	Yes
	Environmental monitoring/observation systems are regularly maintained and updated as is relevant, including forecasts where possible.	Limited
	Methods for data gathering are made transparent and publicly available.	No
	Data are publicly available in raw form.	No
An institution (or institutions) has a mandate to analyze climate-adaptation-relevant information for the country in a way that is useful for key stakeholder groups.	Traditional and/or local climate knowledge and observations are gathered.	No
	The institution(s) undergoes a regular, public process of review and revision of its approach to data analysis.	Limited
	Sufficient budget is provided for ongoing information analysis.	Yes
	The status of vulnerable ecosystems and populations/communities is periodically analyzed.	Limited
	Climate scenarios are developed using all available projections and their uncertainty estimates.	Yes

⁹ www.climatechange.gov.lc

There is an institution(s) in charge of centralizing climate change information and analysis that is stakeholder-driven and transparent	Priorities for analysis are set through a process of broad stakeholder consultation.	Limited
	Analysis is comprehensible to the public.	Limited
	There is consolidation and analysis of relevant climate information in the form of publicly available reports or online sources.	Yes
There is a platform or network for sharing information on adaptation to diverse information users.	There is a system for monitoring and evaluation of information dissemination, as well as revision of dissemination strategies.	Limited
	Sufficient budget is provided for ongoing information dissemination.	No
	The mandated institution coordinates appropriately with other institutions.	No
	There is an efficient and fair means for individuals and organizations to demand climate-relevant information.	Limited

4.8.5 Mainstreaming

The Environmental Impact Assessment (EIA) regulation is the only current regulation that facilitates the mainstreaming of climate change adaptation into sectoral planning. The EIA process is led by the Development Control Authority (DCA), which seeks the advice of the SDED on projects that have the potential to significantly impact the natural environment or which may exacerbate climate change risks. Other opportunities which have not been fully implemented include the National Environment Commission, which was launched in 2008 to coordinate environment related actions at the national level but there has not been much progress on this front. In practice however, information flows are occurring, although it is unclear the extent to which concerns are being integrated into plans and projects. The SDED is represented on the Development Control Authority where these decisions are made.

A National Development Plan was being developed by the Ministry of Finance at time of research. The SDED expressed the belief that climate change adaptation will be considered in the formulation of the plan and its guidance. The NCCPAP calls for Ministries to consider climate change impacts in planning, but it is not clear to the extent this monitored or is taking place. Mainstreaming indicators for Saint Lucia are evaluated in Table 12.

TABLE 11: MAINSTREAMING INDICATORS FOR SAINT LUCIA

Indicator	Indicator Quality	Response
Are there systems for integrating climate change risk and adaptation into project development?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	Limited—no regulations, but process has started with PPCR
Are there systems for integrating climate change risk and adaptation into planning of critical sectors?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	Limited
Are there systems for integrating climate change risk and adaptation into policies and programs?	There are standards and procedures for integrating climate risk management comprehensively, not just a few sectors.	Limited

4.8.6 Analysis

Saint Lucia has employed a participatory process for the development of its vulnerability and impacts assessment and through the PPCR/SPCR process, which holds significant promise for institutionalizing good practices around assessment, implementation of recommendations, and public engagement in adaptation planning. However, greater evaluation of socioeconomic vulnerabilities could be included in future assessments. The existence of a clear mandate to produce these assessments helps ensure that they will be institutionalized over time. The National Climate Change Committee serves as the national coordinating body and is well represented by a range of agencies. To reach its potential, the outputs from this committee should be disseminated across the participating bodies and inform policies and practices.

A major gap that exists is the lack of a freedom of information law to give the public the right to information. Transparency around climate data, impacts and government response is essential to ensure accountability and is likely to improve citizen participation. In addition, information monitoring and dissemination systems were not functioning at the time of research, rendering them useless for the public and agencies alike. While the NCCPAP calls for the consideration of climate impacts in planning, using tools such as Strategic Environmental Assessments (SEA) may ensure that climate adaptation is considered.

4.9 Selection of Priority Areas

The priority areas selected for Phase II research in Saint Lucia were food security, freshwater resources, and livelihoods and culture. These were selected by civil society participants at a workshop held by the Saint Lucia National Trust. These priority areas had buy-in due to previous civil society consultations that had identified priority areas.

4.10 Priority Area: Food Security

Participants in the workshop identified food security due to expected impacts of increased temperatures and decreased rainfall on subsistence farming and export agriculture. Food security is not based solely on food availability, but also access and utilization.^{liv}

A recent study shows that of vulnerable groups working in food production, fishing, and the service industry, over 20% reported spending “most” or “all” to cover food needs.^{lv} Additionally, extreme weather events can damage food production and have cascading effects on livelihoods. In its recent climate change risk profile, CARIBSAVE found that price shocks after Hurricane Tomas for local foodstuffs such as plantains caused a shift in diets for those who could not afford them. While banana exports have weakened due to international trade shifts, bananas still comprise nearly half cultivated land and exports.^{lvi}

4.10.1 Vulnerability and Impacts Assessment

Food Security was highlighted in the Second National Communications to the UNFCCC and is also addressed in the PPCR. A climate change risk profile conducted by CARIBSAVE provides the most substantive overview, but additional research is needed. Food security vulnerability information may not be clearly disseminated to the public, when it does exist.

4.10.2 Prioritization

While official documents, such as the Second National Communications to the UNFCCC, the NCCPAP, and the PPCR identify food security as a key vulnerability, there are ostensibly no current efforts to sequence priority activities to build resilience. Saint Lucia’s recent *Food Production Action Plan* does not specifically address climate change, but does emphasize key aspects that address food access and availability by:

- Reducing the food import bill by 10% within 2 years and 30% thereafter
- Increase acreage in production and employment by 15%
- Stabilize prices through reduced imports
- Diversify away from banana production^{lvii}

It is unclear how the action plan has been informed, if at all, by climate change vulnerability assessments for Saint Lucia.

Although, there is no specific climate change adaptation budgeting, the 2012-2013 budget summary for the Ministry of Agriculture includes line items designed to increase employment and diversify livelihoods, which may ease socio-economic vulnerabilities as well as food security. An ongoing project between McGill University and CARICOM seeks to develop an approach to more sustainable food systems to improve environmental outcomes, health and nutrition, food access, availability, safety and quality. Whether or how this research may contribute towards a national or regional policy agenda remains to be seen.^{lviii}

4.10.3 Coordination

While it is clear that there are ongoing initiatives to address food security through agricultural policy, it is less clear how well these efforts are being coordinated with new information regarding projected

impacts from climate change on food production and vulnerable livelihoods in related sectors. The Department of Agriculture is represented on the National Climate Change Committee.

4.10.4 Information Management

Information gathered that may impact food production, access, and availability is not being consolidated and disseminated in a manner that is accessible and understandable to civil society organizations.

4.10.5 Mainstreaming

No mainstreaming efforts were identified, the cause of which was attributed to lack of coordination.

4.10.6 Analysis

Although, the ECLAC food security study provided a regional base of research to inform government policy in the region, this research should be “domesticated” at the national level for Saint Lucia to assess specific risks to production, food access, commodity markets, and vulnerable groups. This information should be compiled along with an inventory of projects and programs to increase food security and reduce vulnerability. Stakeholder sessions during the research revealed the existence of multiple overlapping projects that at times were not coordinated between agencies. A climate change coordination council that addresses food security could help alleviate this problem while improving interagency communication.

4.11 Priority Area: Freshwater Resources

The average annual rainfall in the Caribbean region has been diminishing over the course of the last several decades and this expected to continue. A severe drought in 2010 exposed vulnerabilities in Saint Lucia’s freshwater supply and storage. Freshwater resources were also identified by civil society members during the 2011 civil society agenda on climate change.

At the commencement of the research exercise, a meeting was held to identify all the major national and private agencies that are freshwater stakeholders. At the national level, these included the Water Resources Management Agency, National Water and Sewage Commission, Water and Sewerage Company, Forestry Department. Other agencies included the Trust for the Management of Rivers, Caribbean Environmental Health Institute and major hotels which extract water. Due to time constraints, a random sample of agencies was selected and representatives from these agencies were interviewed.

4.11.1 Vulnerability and Impacts Assessment

Existing vulnerability and impacts assessments focus primarily on socioeconomic drivers of biophysical impacts. However these assessments are limited and do not adequately address the vulnerability and impacts of climate adaptation on the various classes of society, gender and the impacts arising from changes in national governance. Having recognized this limitation, the Sustainable Development and

Environment Division (SDED) designed Saint Lucia's Strategic Program for Climate Resilience (SPCR) to include these two outcomes:

- Development of a gender disaggregated information source on specific aspects of vulnerable groups and
- Establishment of targeted programming for different types of vulnerable groups.

The methods for assessing impacts are transparent as they are available to the public upon request and reports have been disseminated to stakeholders who attended consultation workshops. Many of the reports are large documents written with technical language, so the average citizen perhaps would not read or be able to understand the entire document. Government agencies are typically very well represented. Civil society organizations and non-governmental organizations also actively participated in consultations used to inform the assessments.

The assessments have been widely disseminated to all relevant agencies and stakeholders, particularly those who participated in the project activities, through distribution lists. However, these documents are typically large (more than 100 pages) and technical, so are not always easy to understand by the general public.

In addition, the University of the West Indies has commenced a Climate Change Adaptation Strategies for Water Resources and Human Livelihoods in the Coastal Zones of Small Island Developing States (CASCADE) project which is due to be completed in 2014.

The Initial National Communication recognized freshwater as a critical resource and the Second National Communication (SNC) included a detailed assessment of freshwater resources which was conducted in 2010. The SNC contains an inventory of existing and ongoing initiatives in the water sector including the Water Sector Reform Project (1999–2009) and Water Resources Management Project (2000-2003). It also contains an assessment of adaptation options specific to freshwater resources. Appendix 7 of the SPCR contains a 'blueprint' of strategic adaptation projects titled 'Summary of Actions Deemed to be of National Significance for Addressing Climate Change'. Lessons learned have been included in the national communications and customarily included reports of projects that have been implemented by the SDED.

4.11.2 Prioritization

There is a process of sequencing adaptation activities related to freshwater. As an example, the process of developing Saint Lucia's SPCR included prioritization of adaptation strategies. A public sector evaluation of projects including freshwater initiatives proposed by relevant agencies and/or government departments was conducted using predesigned selection criteria.

Stakeholders rated proposed projects (adaptation activities) according to broad categories: cost, effectiveness, ease of implementation, acceptability to local stakeholders, Ministry of Finance and external donors, endorsement by experts, timeframe, institutional capacity, size of beneficiary group, Potential social, environmental and economic costs and benefits, Synergies with other initiatives and sustainability. The highest rated projects were further categorized under five strategic program areas.

The Government of Saint Lucia (GOSL) Estimates of Expenditure reflects funding for climate change initiatives is sourced from external funding agencies including, United Nations Environment Program, Government of Australia, USAID, Climate Investment Fund and the Global Environment Facility. GOSL provides counterpart funding through administrative support provided under those projects.

4.11.3 Coordination

The SDED and the NCCC have been coordinating climate adaptation projects. Government departments and agencies generally collaborate on projects and have started formalizing partnerships with Memorandum of Understandings. Duplication of efforts have existed in the past, however, with the NSCC, the incidence of duplication is decreased; rather projects support each other. Past and ongoing collaborations between agencies exist such as collaboration between the Water Resources Management Agency, Department of Forestry and the Meteorological Office to develop and implement a hydrological monitoring project and participation in the Caribbean Agrometeorological Initiative (CAMI) to improve application and provision of weather and climate information to farmers.

Inter-sectoral collaboration is an ongoing process but interviews reveal that it does not occur as efficiently as it should. Ministries have begun formalizing collaboration by developing Memorandi of Understanding.

4.11.4 Information Management

Actors with a stake in freshwater resources in Saint Lucia have access to data gathered and compiled by various agencies including the Water Resources Management Agency and the Saint Lucia Meteorological Service. Under the first phase of the PPCR, SLING, a Geonode for climate change information sharing was created. During the course of this rapid assessment the website was not functioning and however the researcher was informed that the Geonode would be revitalized under phase II of the PPCR.

The WRMA has an existing internal platform called *WebMap* which will be the agency's node to the national Geonode. *WebMap* is accessible online via a username and password, however, access is currently restricted to staff of WRMA.

The SDED does have an internal database of climate change related projects and information, including freshwater resources. That database can only be accessed physically from the server at the SDED office.

4.11.5 Mainstreaming

Currently there are no regulations requiring that adaptation measures be included in project development, however, several policy documents such as the National Climate Change Policy and Adaptation Plan and the National Water Policy include considerations for climate adaptation to ensure sustainable development.

Saint Lucia has a customary policy of consulting stakeholders during the development and planning phase of national projects. The process of identification of national initiatives is transparent and project documents including consultation workshop reports are readily available upon request from respective agencies and some are available online.

4.11.6 Analysis

Although, past vulnerability assessments did not pay sufficient attention to socioeconomic and political drivers of vulnerability, this is being addressed by the Sustainable Development and Environment Division in preparation for the Third National Communication to the UNFCCC. Similar to other sectors, an improved, publicly available database of adaptation priorities and an inventory of projects and

programs to address these vulnerabilities would strengthen institutional knowledge and improve coordination and awareness between government actors.

4.12 Priority Area: Livelihoods and Culture

Civil society organizations have identified climate change as a threat to livelihoods and culture due to potential impacts on local farming, fishing, and cultural practices and events associated with natural resources. The research for this priority area was conducted by the Laborie Development Foundation. Civil society had already emphasized this area of concern in the 2011 Civil Society agenda on climate change. The premise is that culture and traditional livelihoods are interwoven and that impacts from climate change may threaten traditions and cultural practices in ways that have not been well assessed.

4.12.1 Vulnerability and Impacts Assessment

While several sectors have been assessed in the previous vulnerability assessments, including some with a bearing on livelihoods, cultural impacts have not been assessed. Additionally, there have not been assessments of wealth and credit access, which can contribute to livelihood vulnerability.

4.12.2 Prioritization

There is no process for prioritizing or sequencing adaptation actions within the priority area.

A budgetary process exists for channeling funds, and is based on the Finance Act of Part 3; Section 7 Sub-Sections(s) 1 and 2. The Act stipulates that “(1) Subject to the Constitution and except as otherwise provided in this Act, all revenues and other monies raised or received for the purposes of the Government, not being revenue or other monies which are payable by or under any enactment into some other fund established for a specific purpose, shall be paid into and form part of the Consolidated Fund; and (2) For the purposes of subsection (1), monies raised or received includes monies received by way of a grant, donation, gift or other like method.”^{lix} Consequently, since financing for Climate Change activities comes mainly from external sources, these funds are processed within the national accounting system, and are announced at the beginning of the financial year.

At a 2013 United Nations Framework Convention on Climate Change (UNFCCC) Ministerial High Level Meeting, in Warsaw, Poland, Saint Lucia’s Minister of Sustainable Development, Energy, Science and Technology, Dr. James Fletcher stated that “*the availability of finance is fundamental to realizing Saint Lucia’s goal of successfully addressing climate change*”. He asserted that Saint Lucia needs funds for addressing the following adaptations issues: *upgrading the water supply, improving food security, strengthening our coastal defences, storm proofing infrastructure; and retooling its health sector*”.^{lx} While the other two priority sectors are mentioned, impacts on livelihoods and culture are not.

4.12.3 Coordination

While the NCCC includes representatives from sectors, such as agriculture and tourism where livelihoods are expected to be affected, there is no representative from an organization specifically representing livelihood and culture issues.

4.12.4 Information Management

Given the breadth of the priority sector, relevant information is provided by Saint Lucia Meteorological Services. However, as discussed above, data collection and maintenance are ongoing issues.

4.12.5 Mainstreaming

Interviews with the SDED, Chief Physical Planning Officer and Legal Officer of Ministry of Physical Development, Housing & Urban Renewal confirm that strides have been made to mainstream climate change adaptation, but there was still much to be achieved. Projects highlighted include: Ministries responsible for the Health and Education sectors; The Water and Sewerage Company (WASCO) with reference to Wastewater management plan; Water Resources Management Agency (WRMA); Physical Development; Forestry Dept. Watershed management plan; Dept. of Fisheries, and several others.

Interviews with key government and civil society stakeholders suggest a need to legislate climate change adaptation mainstreaming, including its impacts on vulnerable livelihoods.

4.12.6 Analysis

The loss of cultural traditions and traditional livelihoods is a concern for civil society organizations in Saint Lucia and should therefore be included in public discussions of climate change impacts. Impacts to traditional livelihoods, such as fisheries, foodstuffs, or urbanization due to loss of livelihoods can have cascading effects of social stability. While it is difficult to assess livelihoods and culture as a “sector” per se, the social and cultural impacts of climate change in Saint Lucia may provide an entry point for engaging the public and discussing solutions.

5 ANALYSIS OF THE ARIA TOOLKIT AND METHOD

5.1 Purpose of the ARIA toolkit

The Adaptation: Rapid Institutional Assessment (ARIA) toolkit was developed by the World Resources Institute to provide civil society organizations with a framework, methodology and approach to assessing national institutional capacities to effectively develop and implement climate change adaptation policy. It was developed to complement the National Adaptive Capacity (NAC) framework, a tool designed to enable governments to systematically self-assess institutional strengths and weaknesses. It was designed to help policy-makers identify and fill gaps, establish a baseline for monitoring, and gather and synthesize resources.^{ixi} The ARIA toolkit was adapted from the NAC framework in response to civil society demand from the Access Initiative’s¹⁰ network of 200+ members in 50+ countries.

¹⁰ The Access Initiative promotes the rights of the public to access environmental information, participate in decision-making, and access mechanisms of justice or grievance. www.wri.org/tai

Both tools are rooted in the well-established fact that effective implementation of adaptation policy will require: building institutional capacity to assess risks, engage affected stakeholders—including vulnerable populations, prioritize responses, establish feedback and accountability mechanisms, ensure coordination between agencies and across sectors, establish and maintain systems that consistently provide relevant and accessible information, and integrate resilience and adaptation measures into sectoral policy, land-use planning, and development projects.^{lxii lxiii} The ARIA toolkit, piloted in Bolivia, Ghana, Ethiopia, and Sri Lanka, has been revised in response to feedback from users.

The ARIA toolkit is intended to help civil society organizations produce a systematic assessment of institutional strengths and weaknesses which can then be used to develop recommendations for low-cost next steps and as a platform to engage more meaningfully with government decision-makers. Through analysis of policies and plans, complemented by interviews with key stakeholders, civil society organizations can more effectively monitor national progress towards building capable institutions while also conducting deep dives of how these institutions are functioning in key sectors. Through both the process and the output, civil society organizations and networks should be more engaged in adaptation policy and have developed a dialogue and opportunities to influence decision-making processes. The latter is enabled, in part, through cross-sector advisory panels in each country comprised of individuals capable of validating results, and disseminating the products to key stakeholders.

5.1.1 Contents of the ARIA toolkit

The ARIA toolkit (as well as the NAC) assesses the quality of five critical functions for climate change adaptation: 1) assessment 2) prioritization 3) coordination 4) information management and 5) mainstreaming. The assessment function determines whether vulnerability and impacts assessments have been conducted, and adaptation actions have been inventoried. The prioritization function determines whether a process exists for identifying priority sectors, populations, or geographies; whether adaptation institutions are operationalized through national budgets, and if there is a monitoring or feedback process for reevaluating priorities. Coordination indicators assess whether coordination needs for adaptation are being identified and if there is an effective, accountable body tasked with coordinating across agencies and sectors. Information management functions assess systems for collecting, maintaining, analyzing, and disseminating information that is relevant for adaptation. The mainstreaming function determines whether there are systems for mainstreaming climate change adaptation into relevant planning processes, projects, policies, and programs.

Nearly every indicator has a subset of questions to determine quality of the institution or function being assessed. These qualities are categorized under transparency and participation (e.g. is the process for determining priorities transparent and is the public involved?), accountability and enforcement (e.g. are there efficient and fair means for the public to demand climate-relevant information?), capacity (e.g. sufficient budget is provided for ongoing information dissemination), and comprehensiveness (e.g. coordination needs across sectors have been considered and described in a publicly available document). These qualities are scored as “yes”, “limited”, or “no”. Each indicator and quality contains guidance for the researcher as well as guidelines on evaluating laws, policies, and conducting interviews.

5.1.2 How to use the ARIA toolkit

ARIA utilizes a two-phased approach. In the first phase, lead civil society organizations (CANARI and Saint Lucia National Trust, in this case) conduct a national assessment of the above functions. These lead organizations then hold workshops to train other civil society groups which may focus on specific

sectors, groups, or areas. The research from Phase I is collectively validated before a selection of three priority areas is made to apply the Phase II workbook. This is accomplished through the multi-stakeholder workshop and through the advisory panel.

The Phase II research is typically conducted by organizations who have participated in this workshop (as was the case in Saint Lucia), however, due to the limited time and inadequate funds CANARI decided to hire a research consultant to conduct the Phase II research in Trinidad and Tobago. The Phase II indicators build upon the findings from Phase I.

The final phase consists of communication of results through meetings with government and civil society, convening dialogues to highlight gaps that should be addressed, and the dissemination of policy briefs.

The initial workshops were held in Port of Spain, Trinidad and Tobago and Castries, Saint Lucia in April of 2013. Both initial workshops were attended solely by government agency representatives, however follow-up workshops were held for civil society.

6 LIMITATIONS OF THE PROJECT AND TOOLKIT

There are several notable limitations to the project and toolkit.

- The ARIA toolkit does not provide adaptation policy analysis. It does not attempt to normatively evaluate whether a policy is appropriate or responsive to likely vulnerabilities. As described above, it provides a snapshot of key institutional functions that are important for effective adaptation.
- The toolkit relies, in good part, on interviews with key agencies involved in adaptation. In some cases, agencies did not respond to requests for interviews or agency personnel may not have been well informed. The former issue may provide some insight on how well agencies engage the public and share information. The authors have attempted to mitigate these threats to research robustness through review by the advisory panel.
- The ARIA toolkit is intended to produce an overview of national institutional capacities before focusing on select priority areas. However, it does not provide an in-depth evaluation of any particular agency to assess resources, structure, incentives, and other factors that influence performance or decision-making.
- As previously mentioned, Phase II research in Trinidad and Tobago was undertaken by a hired consultant rather than by civil society organizations due to inadequate funds and time constraints.
- The process by which the priority areas were selected for Phase II research in each country was dependent upon contingencies in each country. For instance, researchers in Trinidad and Tobago initially identified water resources management as a priority area, but elected not to pursue it after unsuccessful attempts to contact relevant agencies. In Saint Lucia, the selection of “Livelihoods and Culture” presented challenges as this is neither an ecological or economic

sector, but is instead cross-cutting and likely to have vulnerabilities embedded in various sectors (e.g. tourism, agriculture, etc.)

7 ADVISORY PANEL

Rather than forming separate advisory panels for each country, project participants in Trinidad and Tobago and Saint Lucia elected to create one advisory panel that would be represented by national and regional experts. Members came from academia, government, regional and international climate institutions, and civil society. As in previous ARIA assessments, an advisory panel was established to carry out multiple functions, including quality control of research, networking for greater impact and engagement, and awareness-raising of results. The extent to which the panel was able to carry out these functions was limited by the establishment of the panel mid-way in project implementation, and by the demands on the time of these experts in their work and other national and regional commitments. However, the project demonstrated the contribution that such a panel could make in studies of this nature.

8 LESSONS LEARNED

The research process for this project and the subsequent results provided for several lessons learned. These included:

- It is critical to identify early in the research process the most appropriate government contacts who will be able to capably respond to the ARIA indicators. The exercise revealed that knowledge on climate change adaptation processes is not evenly distributed across agency personnel
- The process for identifying priority sectors in Phase II may need more guidance to increase consistency and reduce overlap
- Mandates and responsibilities for climate change adaptation procedures among ministries and agencies may be in a state of flux or unclear, even to those within the agencies
- Additional financial support for training and staff time to enable local CSOs to carry out Phase II research
- Organizers of the Phase I workshop should consider inviting government and civil society participants
- The establishment of an advisory panel for the research took significantly longer than expected and contributed to delays in the research product. While the advisory panel can play an important role, future project organizers should consider the time that would be required to get the inputs of the panel into the various phases of the project
- The research process affirmed that significant knowledge gaps persist at the civil society level regarding national climate change adaptation priorities and activities. These include, to varying degrees, awareness of potential impacts and vulnerabilities, relevant institutions with which to access information and participate in decision-making, and existing plans and programs to address vulnerabilities at the national or sectoral levels.

9 DISCUSSION AND RECOMMENDATIONS

Trinidad and Tobago and Saint Lucia have both recognized through international forums and national policy the risks of climate change and the need to develop and implement adaptation options. Both countries have recently undergone political and bureaucratic reorganization, which may present opportunities for realigning objectives, instituting new policies and practices, and developing mechanisms for coordination, information sharing, and mainstreaming of adaptation into sectoral planning and projects. Although Trinidad and Tobago is the wealthier nation with higher development indicators, Saint Lucia has developed more robust institutions around vulnerability assessment, coordination, and mainstreaming. Even though the reasons behind this cannot be discerned with certainty, hypotheses could include that Saint Lucia is more aware of its vulnerability, particularly following the damage from Hurricane Tomas and the 2010 drought. Both countries need to prioritize information collection, management, and dissemination to the public. The following recommendations have been generated based on the results of the two-phased assessment and reflect contributions from lead partners as well as other civil society organizations and researchers who contributed to the workbooks.

1. **Vulnerability and impact assessments should consider socioeconomic and political drivers of vulnerability as well as adaptive capacity.** Vulnerability and impact assessments are rarely ever uniform across countries, nor should they be. Good progress has been made in both countries to assess exposure to risk. However, assessing vulnerable groups and sectors will be critical for prioritizing and implementing adaptation options. Vulnerability assessments should be led by national priorities, informed through public consultations. This is taking place through the PPCR/SPCR process in Saint Lucia, and has started occurring through the ICZM process in Trinidad and Tobago. Both countries have submitted recent National Communications to the UNFCCC. Smaller vulnerability assessments have been conducted by foundations, aid organizations, and universities. These should contribute towards a national base of knowledge to inform adaptation options. Good practice guidance on assessing vulnerability and impacts can be found in the UNEP Program on Research of Climate Change Vulnerability, Impacts and Adaptation (PROVIA)^{lxiv}
2. **Create and maintain a public inventory to monitor the implementation of adaptation options.** Neither country has consolidated an inventory of projects and programs that were guided, in whole or part, by projected climate change impacts. Understanding what has been tried, whether it met its objectives, and why or why not can save resources, improve transparency, and raise public awareness. This can help provide an institutional history of lessons learned and possibly facilitate coordination between the government, private sector, and civil society.
3. **Institutionalize coordination bodies for climate change adaptation.** This is already starting to occur in Saint Lucia with the NCCC. These committees should represent all relevant agencies, civil society, and the private sector. Sufficient resources should be provided to maintain and encourage participation from representatives who have decision-making ability within their respective entities. The decisions and outcomes of these bodies should be made transparent for public comment. Formal policies and procedures may be needed to provide guidance and

ensure sustainability. Interagency communication may be improved through the development of an interagency communications strategy and buy-in at the necessary level for each agency.

4. **Information collection and management systems need to be maintained, consolidated, analyzed, and disseminated in an appropriate manner.** Both countries should develop, adapt, or revitalize platforms for managing and disseminating relevant climate change information, including temperature and rainfall data and trends, sea surface temperature and coral reef impacts, coastline erosion and freshwater supply, etc. These platforms either do not exist, or are not being maintained. In Saint Lucia, the SLING Geonode could be revitalized to meet this purpose. It is essential to maintain monitoring instruments and keep websites functional and up to date. The existence and promotion of these platforms have the potential to raise public awareness and participation in climate change adaptation.
5. **Provide for greater public participation and review procedures in the development of priorities and monitoring of policy implementation.** The SPCR process in Saint Lucia is a very promising development that can be learned from to draw lessons on public participation, coordination, and mainstreaming.
6. **Coordinate national climate policy with the CARICOM Regional Implementation Plan.** It is unclear how much influence and monitoring is occurring at the national level to align national policies and institutions with regional initiatives through the CCCCC. Whether this is occurring and not being publicly shared is unclear, but was not reported through interviews.
7. **Develop innovate financing mechanisms.** In addition to international aid organizations, the Green Climate Fund, and the Adaptation Fund, Saint Lucia and Trinidad and Tobago should look to innovatively expand mechanisms such as Trinidad and Tobago's Green Fund to help finance adaptation activities.
8. **Use local and regional models of success.** Improved coordination, information management, and mainstreaming practices are being piloted in both countries. These should be monitored and evaluated with lessons learned shared with other stakeholders.

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