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RESOURCES
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Adaptation: Rapid Institutional Analysis (ARIA) PHASE II RESEARCH REPORT

Trinidad and Tobago

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List of Acronyms and Abbreviations

ARIA	Adaptation: Rapid Institutional Analysis
CAMI	Caribbean Agrometeorological Initiative
CANARI	Caribbean Natural Resources Institute
CARDI	Caribbean Agricultural Research and Development Institute
CARIRI	Caribbean Industrial Research Institute
CDKN	Climate and Development Knowledge Network
CEC	Certificate of Environmental Clearance
CIMH	Caribbean Institute for Meteorology and Hydrology
COPE	Council of Presidents of the Environment
CTO	Caribbean Tourism Organisation
EIA	Environmental Impact Assessment
EPPD	Environmental Policy and Planning Development
EU	European Union
EMA	Environmental Management Authority
GDP	Gross Domestic Product
GHG	Greenhouse gas
GORTT	Government of the Republic of Trinidad and Tobago
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IICA	Inter-American Institute for Cooperation on Agriculture
IMA	Institute of Marine Affairs
IMO	International Marine Organisation
MEA	Multilateral Environmental Agreement

MEAU	Multilateral Environmental Agreement Unit
MEWR	Ministry of Environment and Water Resources
MFPLMA	Ministry of Food Production, Land and Marine Affairs
NAC	National Adaptive Capacities
NAMDEVCO	National Agricultural Marketing and Development Corporation
ODPM	Office of Disaster Preparedness and Management
PETROTRIN	Petroleum Company of Trinidad and Tobago Limited
PSIP	Public Sector Investment Programme
SLNT	Saint Lucia National Trust
SNC	Second National Communication
TCPD	Town and Country Planning Division
TDC	Tourism Development Company
THA	Tobago House of Assembly
TTMS	Trinidad and Tobago Meteorological Services
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
UNWTO	World Tourism Organisation
V&I	Vulnerability and Impact
WASA	Water and Sewerage Authority
WRI	World Resources Institute

1. EXECUTIVE SUMMARY

This report examines the degree to which there exists enabling factors to support the development of climate adaptation policy and strategies in three critical sectors in Trinidad and Tobago - coastal zone management, food production and tourism. As an important global environmental issue, climate change poses a significant threat to all development sectors. Designing and implementing national climate adaptation strategies is therefore critical. In this context, it is important to have an enabling institutional environment that will support climate adaptation across all sectors. This report presents the findings from a rapid institutional analysis that was undertaken by the Caribbean Natural Resources Institute (CANARI) using the Adaptation: Rapid Institutional Analysis (ARIA) tool developed by the World Resources Institute (WRI).

The institutional readiness of the coastal zone management, food production and tourism sectors to adapt to climate change was evaluated against five (5) indicators: vulnerability assessment, prioritisation, coordination, information management and mainstreaming. In general, research findings draw attention to the fact that there are significant gaps at the national institutional level for each of the identified sectors with respect to climate adaptation readiness. The following are key findings for each indicator:

Assessment: There are limited national vulnerability and impact (V&I) assessments for the food production and coastal zone management sectors to guide strategic adaptation interventions, while none appear to exist for the tourism sector.

Prioritisation: Similarly, there is little prioritisation of climate adaptation strategies at the national level for the identified sectors, most notably in the food production and tourism sectors. While there are some projects/programmes currently being undertaken by the line Ministry for food production that relate to adaptation, climate adaptation is not a stated strategic focus. Work under the Cabinet appointed Integrated Coastal Zone Management (ICZM) Committee chaired by the Institute of Marine Affairs (IMA) represents the most significant efforts at climate adaptation related to the coastal zone. National budgetary allocations to support adaptation measures also seem to be inadequate.

Coordination: National climate adaptation efforts are not being effectively coordinated among government, civil society and academia. The Environmental Management Authority (EMA) is currently in the implementation phase of a financial and technical assistance agreement from the Inter-American Development Bank (IDB) to improve its coordinating role in mainstreaming climate change related priorities into all development sectors. The Cabinet appointed Integrated Coastal Zone Management (ICZM) Committee, again, represents the most significant efforts at coordination, among government, private sector and international agencies, of climate adaptation efforts related to the management of the coastal zone.

Information management: Climate relevant information is available from the Trinidad and Tobago Meteorological Service (TTMS) for all sectors. In particular is an Agro-meteorological forecasting service available for farmers. More sector specific information, especially in a form that is easily

useable by decision-makers, for other sectors is less readily available. While some information may exist from various sources, there is no single platform that consolidates this information for easy distribution to interested stakeholders.

Mainstreaming: Currently efforts are underway by the EMA to mainstream climate change into national developmental planning.

2. INTRODUCTION

Many Caribbean islands are already feeling the impacts of climate change, namely more intense storms and hurricanes, unpredictable seasons, decreases in fish catch and warmer coastal waters. While it is important to understand the changes that climate change is having on human and environmental systems, it is equally, if not more important, to develop strategies to mitigate and adapt to these changes. Whereas mitigation will help reduce future adverse effects, adaptation helps people, businesses, infrastructure and ecosystems cope in the present. To be successful adaptation strategies will need to be well coordinated across all sectors, guided by up to date relevant scientific data and supported by adequate financial, legal and political frameworks. For this to occur, climate change adaptation projects and programmes need to be underpinned by a supportive national policy environment and good governance practices.

An assessment of current climate adaptation institutions is therefore necessary to identify the factors that either enable or limit adaptation policies and programmes. Once the gaps can be identified, actions can be taken to address them. Such an approach would improve the impact of national adaptation actions. This report therefore examines to what degree there exist enabling factors to support the development of adaptation policy and activities, with relevance to coastal zone management and the food production and tourism sectors in Trinidad and Tobago.

2.1 *Analysing climate change policy and institutions in St. Lucia and Trinidad and Tobago*

In January 2013, the Caribbean Natural Resources Institute (CANARI), in partnership with the World Resources Institute (WRI) and the St. Lucia National Trust (SLNT) initiated a one year project entitled "*Analysing climate change policy and institutions in Saint Lucia and Trinidad and Tobago: Piloting a Caribbean process*". The main purpose of the project, which is being funded by the Climate and Development Knowledge Network (CDKN), is to assess the readiness of national institutions in Trinidad and Tobago and St. Lucia to adapt to climate change.

CANARI and SLNT function as the lead organisations for the project in Trinidad and Tobago and St. Lucia respectively. Each organisation was provided with an Adaptation: Rapid Institutional Analysis (ARIA) indicator-based toolkit, designed by the WRI. The ARIA toolkit, is based on the National Adaptive Capacities (NAC) Framework, and is specifically intended to help civil society organisations assess national-level institutional quality and governance in climate change adaptation. The ARIA toolkit includes an ARIA Phase I workbook and an ARIA Phase II workbook. Each workbook identifies five (5) key functions - *assessment, prioritization, coordination, information management, and mainstreaming* - that national institutions will need to perform to build adaptive capacity to climate change.

In Trinidad and Tobago the research for the project was undertaken in two phases: Phase I and Phase II. The ARIA Phase I workbook was used in Phase I to assess the entire national institutional context with respect to climate change adaptation. Three priority areas, Tourism, Food Production and Coastal Zones were also identified in this phase for further analysis in Phase II. A workshop with civil society and government partners was organized by CANARI before the start of Phase II to review the findings of Phase I and validate the selection of the priority areas.

Phase II of the project commenced in September 2013. The ARIA Phase II workbook was used to assess each of the selected priority areas. Although the Phase II workbook was intended to be completed by a group of civil society partners, this was precluded due to restrictions on time and funding. Instead, a consultant was hired to undertake the research for Phase II of the project.

2.2 ARIA Phase II Report

This report presents the findings of the Phase II ARIA research for each of the selected priority areas- food production, coastal zone of Trinidad and Tobago and tourism. The report also recommends areas for advocacy by civil society for each priority area based on the findings of the Phase I and Phase II research.

2.3 Limitations of the study

Due to limitations on time and funding Phase II of the project could not be conducted by the civil society partners as originally intended. Instead, the research for Phase II was undertaken by a consultant. For similar reasons, the assessment of institutions in Tobago was not included in Phase II.

2.4 Method

The research for Phase II of the ARIA study in Trinidad was undertaken by a consultant and conducted between September 27th to October 23rd, 2013. The research was broken down into four main stages: i) review of the findings of Phase I ii) background research and desk reviews iii) interviews with key informants and iv) completion of the Phase II ARIA workbooks.

The first stage of the research process involved attending a workshop organized by CANARI to review the findings of the Phase I research undertaken by the previous consultant for the project. The three priority areas (tourism, food production and coastal zones) were also selected and validated at this workshop.

Background research was then undertaken by the consultant to become familiar with the use of the workbook, in addition to, sourcing relevant documentation for the priority areas. Following this, interviews were conducted with key informants for each priority area. Interview questions were guided by the information required to complete the “indicators” and “qualities” sections of the ARIA workbooks. Interviews were administered in-person and via phone and email using a preselected set of questions based on the aforementioned workbook sections. The final stage of the research process entailed the completion of the ARIA Phase II workbooks for each priority area by the consultant, using the information acquired from the desk reviews and interviews.

Finally, the Phase II ARIA report was drafted based on the findings of the ARIA Phase II Workbook.

3. PRIORITY AREA - FOOD PRODUCTION

3.1 Background

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 Government of the Republic of Trinidad and Tobago (GORTT). The strategic medium-term objectives, for developing agriculture and achieving food security, outlined in the framework include the:

- i) reduction of the food import bill (Target: ten percent (10%) annually);
- ii) reduction of the rate of inflation (and sustain it within single digits);
- iii) creation of sustainable, long-term productive employment in the sector to support a national unemployment level that is below seven percent (7%);
- iv) increase the sector's contribution to gross domestic product (GDP) (Target: three percent (3%) by 2014); and
- v) creation of a food secure nation.

In achieving these objectives the GORTT has also outlined the following nine (9) strategic initiatives for the sector:

- i.) Increase agricultural production, distribution and access.
- ii.) Develop a water resources management strategy
- iii.) Improve land management and the tenure of farmers
- iv.) Expand source markets for imports
- v.) Encourage youth participation in the agriculture sector
- vi.) Encourage higher levels of productivity for locally produced goods
- vii.) Encourage the consumption of healthy, locally produced food
- viii.) Creating the linkages between agriculture and other productive sectors
- ix.) Effectively monitor prices and movement of inflation

While none of the aforementioned objectives or strategies specifically identifies climate change adaptation of the sector as an outcome, some of the objectives and strategies support adaptation. For example, strategies to address national food security are important to climate adaptation. Food security is predicted to be an important issue as regional and global 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. 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.

3.2 Findings from ARIA Phase II Survey

3.2.1 Assessment

Vulnerability and Impacts 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.

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. While only briefly, consideration is also 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.

The qualities of the UNECLAC assessment are evaluated below in Table 3.1.

Table 3.1: Qualities and findings of the vulnerability and impact assessment indicator

Indicator	Qualities	Evaluation	Findings
Is there an assessment of climate change vulnerability and impacts for the priority area?	The assessment includes both socioeconomic and biophysical aspects of vulnerability and impacts (Comprehensiveness)	Limited	The assessment mainly emphasises biophysical and economic impacts. It briefly extrapolates the effects that these impacts will have on human health and the livelihoods of farmers and fishers.
	Assessment Methodology is made transparent (Transparency & Participation)	Limited	The final report is accessible online on UNECLAC's and Caribbean Community Climate Change Centre's (CCCCC) websites and is freely available for download.

			<p>http://www.caribbeanclimate.bz/closed-projects/eclac-review-of-the-economics-of-climate-change-in-the-caribbean-recc.html</p> <p>The assessment report includes a significant amount of technical jargon and may be difficult to understand by laymen.</p>
	<p>Broad set of stakeholders were engaged in assessment development.</p> <p>(Transparency & Participation)</p>	Limited	<p>Meeting reports for this project indicate that consultation was sought from a variety of stakeholders on the regional and national level. Nationally, the former Ministry of Planning, Housing and the Environment, the Ministry of Foreign Affairs and the University of the West Indies, St. Augustine were involved in the project.</p> <p>In reviewing the assessment report, it is evident that information from other government agencies was included. It is however unclear the degree to which these organizations participated in the assessment outside of providing data.</p> <p>The method does not indicate the extent of involvement, if any, of civil society groups in the undertaking of the assessment.</p>

Inventory of Ongoing Adaptation Efforts

There is no inventory of past or ongoing adaptation efforts nationally (CANARI, 2013). No inventory exists for the food production sector specifically.

3.2.2 Prioritization

Process for the establishment of priorities

While climate adaptation is not a stated priority for the food production sector in Trinidad and Tobago, there are initiatives which have been outlined in the Ministry of Food Production’s National Food Production Action Plan 2012-2015 and Strategic Plan 2011-2015, that do in fact relate to climate change adaptation. The strategic actions and initiatives outlined in these plans were determined through collaborative and consultative processes among internal and external Ministry stakeholders. The methodology of the Ministry’s Strategic Plan states:

“Since July 2010, the Ministry of Food Production Land and Marine Affairs (MFPLMA) has been interacting extensively with its clientele, the key actors along the value chain from ‘Farm to Fork’. They include farmers, fishers, input suppliers, marketers, processors/manufacturers, entrepreneurs and related supporting service and stakeholder communities. These discussions culminated in three structured national consultations which identified and validated the following critical areas for intervention: infrastructure; incentives; value chain management and marketing; praedial larceny; commodity development – crops, horticulture, livestock; fisheries management and development; technical support; finance and investment capital; land management (including large farms); and labour. Information generated from the consultations was analysed and incorporated in formulating the Ministry’s One Year Action Plan. This process is intrinsically linked to the preparation of the Strategic Plan. The in-depth nature of the interactions with the stakeholder communities lent credibility to the further structured conversations relating to the strategic planning exercise since the latter were seen as part of a continuing dialogue.”

The qualities of the Ministry of Food Production’s prioritisation process are evaluated in Table 3.2 below.

Table 3.2 Qualities and findings of the prioritisation process indicator

Indicator	Quality	Evaluation	Findings
There is a process for sequencing adaptation activities in the priority area	Process for sequencing adaptation activities is transparent and publicly available (Transparency & Participation)	Yes	The methodology for the development of the Ministry of Food Production’s Strategic Plan 2011- 2015 is clearly outlined in the document. The Plan is publicly available on the Ministry’s website.
	Broad set of stakeholders	Yes	According to the methodology of the Ministry of Food

	<p>were engaged in sequencing process— including vulnerable and marginalized groups – in order to assure that priorities are informed by a broad range of perspectives.</p> <p>(Transparency & Participation)</p>		<p>Production’s Strategic Plan 2011-2015, in developing its Strategic Plan and Action Plan the Ministry of Food Production consulted with a wide range of internal and external stakeholders. Groups included:</p> <ul style="list-style-type: none"> • Governing bodies and policy makers – Cabinet and Parliament • Productive sector- farmers, fisherfolk, food processors, conservation groups, homeowners, back-yard gardeners, • Related Public Sector affiliates • Ministries • National agencies • Regional agencies
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Budget processes

Finance is available for projects through annual national budgetary allocations under the Public Sector Investment Programme (PSIP) and from international financing agencies. Table 3.3 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). The qualities of the budgetary process for the food production sector are evaluated in Table 3.4.

Table 3.3: Projects being undertaken by the Ministry of Food Production relevant to climate change adaptation

Project	Budgetary Allocation	Financing Institution
<p>Water Management and Flood Control Programme – the objective of the Programme is to increase farm output and income through improved water management infrastructure (Ministry of Planning and Sustainable Development, 2012).</p>	TT\$554M	Government- Public Sector Investment Programme (PSIP)

Project	Budgetary Allocation	Financing Institution
<p>Accelerated Pond Construction Programme - 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 Programme involves the construction of 2,349 ponds during 2011-2015 (Ministry of Planning and Sustainable Development, 2012).</p>	TT\$82M	Government-Public Sector Investment Programme (PSIP)
<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>	€190,610.00	European Union (EU)
<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>	TT\$8.2M	Government -Public Sector Investment Programme (PSIP)
<p>Community Based Aquaculture Programme -will establish a model aquaculture farm for training, field testing and demonstration purposes at Bamboo Grove (Ministry of Planning and Sustainable Development, 2012).</p>	TT\$3M	Government -Public Sector Investment Programme (PSIP)

Table 3.4: Qualities and findings of the budgetary process indicator

Indicator	Quality	Evaluation	Findings
Budgetary processes exist to channel finance adaptation institutions or initiatives for the priority area.	The agency (ies) most closely tied to the priority area reflect adaptation initiatives in their annual budgets. (Comprehensiveness)	Yes	The climate change adaptation related projects listed in Table 2.3 are in line with strategic goals established by the Ministry of Food Production and are included in the Public Sector Investment Programme Budget 2013-2015 (http://www.finance.gov.tt/content/3-year-PSIP-2013-2015.pdf). While financed by the European Union, the “Water Management and Irrigation Assessment and Development on the Felicity Site, Central Trinidad” project is also in line with priorities established for the sector.
	Budgetary information for adaptation activities in the priority area is available and accessible. (Transparency & Participation)	Yes	Budgetary information for the PSIP financed projects are available online through the Ministry of Finance’s website in the “Three year Public Sector Investment Programme 2013-2015” report (http://www.finance.gov.tt/content/3-year-PSIP-2013-2015.pdf). The PSIP Report, however, does not provide a

			<p>detailed breakdown of the budgetary allocation for the projects.</p> <p>Information on the European Union funded project is available on the EU's Delegation to the European Union to the Republic of Trinidad and Tobago projects' page</p> <p>http://eeas.europa.eu/delegations/trinidad/projects/list_of_projects/315545_en.htm.</p>
	<p>Budgetary allocations are sufficient to enable adaptation activities to proceed according to plans. (Capacity)</p>	Limited	<p>While it could not be determined if the budgetary allocations for the specific projects listed were sufficient, the Ministry of Food Production noted in its Strategic Plan that <i>"The MFPLMA budgets are often the first to be cut resulting in the scale-back of essential services and programmes, compromising performance and stakeholder confidence (in the) MFPLMA"</i></p>

3.2.3 Coordination

An initiative to improve coordination across all sectors, regarding environmental issues and notably climate change, is currently being undertaken by the Multilateral Environmental Agreement Unit (MEAU) of the MEWR. According to the Environmental Policy and Planning Division of Trinidad and Tobago (EPPD), in 2012, the MEAU sought to establish MEA Focal Points, nominated from relevant stakeholders in the public sector, NGOs and CBOs, to promote participatory management and decision making on national environmental issues. The key role of the MEA focal point will be to:

- liaise with the Ministry as the National Focal Point in respect of the role and functions of their respective institutions in the context of the national obligations under the various MEA
- provide advice and inputs into strategies and actions to be taken at the national level in the implementation of obligations under the MEA and climate change
- provide inputs, data and information to facilitate reporting requirements of Trinidad and Tobago under the MEA
- provide advice and inputs into work programmes of their respective Ministries/agencies in the context of national obligations under the MEA and climate change
- interface with other relevant stakeholders through relevant networking media to enhance co-operation at various levels

The MEAU hosted a sensitisation and capacity building session, with a wide cross section of stakeholders representing various sectors, toward the establishment of the MEA Focal Points; however, to date it has not been formally brought into being.

The Ministry of Food Production is also 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. The National ICZM Steering Committee is a Cabinet appointed multi-sectoral committee, chaired by the Institute of Marine Affairs (IMA), with a mandate 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 (IDB, 2013). The twelve (12) member Steering Committee is comprised of various Ministry representatives and one civil society representative, all with a vested interest in the coastal zone and how it is managed. One of the thematic areas of the Committee's work is vulnerability assessments and climate change adaptation. 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 also recently collaborated with the Water and Sewerage Authority (WASA), a statutory agency attached to the Ministry of Public Utilities, on the European Union financed "Water Management and Irrigation Assessment and Development on the Felicity Site, Central Trinidad" project.

At the regional level, the Ministry of Food Production collaborates with institutions such as the Caribbean Agricultural Research and Development Institute (CARDI) and the Inter-American Institute for

Cooperation on Agriculture (IICA). Both organisations 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 March 2013. According to a media release from CARDI, the agreement is a result of both institutes’ fervent desire to develop strong working relationships in support of agriculture, food production and rural development in the Caribbean (CARDI, 2013). One of the areas of joint collaboration, specifically related to climate change adaptation, is the identification of varieties of food producing plants which are resistant to climate factors such as heat, drought and excess water (CARDI, 2013). CARIRI was established by Act of Parliament No. 19 of 1971 and amended by Act No. 33 of 1981 to, *inter alia*¹:

- provide technical and industrial services to public and private industrial enterprises
- advise the Government on the formulation of specifications, the promulgation and application of industrial processes and practices and the preparation of industrial standards)

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.

Coordination qualities for the food production sector are evaluated in Table 3.5.

Table 3.5: Qualities and findings of coordination indicator for the food production sector

Indicator	Quality	Evaluation	Findings
The priority area is included in national coordination efforts.	There is horizontal coordination (across ministries) as necessary, to carry out adaptation initiatives for the priority area. (Capacity)	Yes	The Fisheries Division of the Ministry of Food Production is represented on the National Integrated Coastal Zone Management Steering Committee which is comprised of a mix of government ministries along with civil society representation.
	There is vertical coordination (global, national, local) as necessary to carry out adaptation initiatives	Yes	The Ministry of Food Production collaborates with regional institutions such as the Caribbean Agricultural Development Institute (CARDI) and the Inter-American Institute for Cooperation on

¹ Caribbean Industrial Research Institute (CARIRI) Act
http://rgd.legalaffairs.gov.tt/Laws2/Alphabetical_List/lawspdfs%20/85.52.pdf

Indicator	Quality	Evaluation	Findings
	for the priority area. (Capacity)		Agriculture (IICA). The Ministry received financing for irrigation projects from the European Union (EU). The TTMS, CARDI and CIMH collaborated on the EU funded Caribbean Agrometeorological Initiative (CAMI) to establish an agrometeorological service for the farming community in Trinidad and Tobago.
	There is intersectoral coordination (between gov't, civil society, and/or business) as necessary to carry out adaptation initiatives for the priority area. (Capacity)	Yes	The Ministry of Food Production is included in the national coordination efforts of the National Integrated Coastal Zone Management (ICZM) Steering Committee. The Ministry of Food Production is represented on this Committee by the Fisheries Division. The twelve (12) member Committee is comprised of various ministry representatives in addition to a civil society representative all with an interest in the coastal zone and how it is managed.

3.2.4 Information Management

Data Gathering

The Trinidad and Tobago Meteorological Service (TTMS) makes climate relevant information available and in a usable format to key stakeholders in the food production sector upon request and online at the TTMS website (metoffice.gov.tt). Data includes rainfall, temperature and wind.

In 2010, the TTMS also launched its agro-meteorological service, which provides climate bulletins (10-day forecasts, and three-month seasonal forecasts) to the agriculture sector. The agro-meteorological service was established under the, Caribbean Agro-meteorological Initiative (CAMI) project: a joint initiative between the TTMS (and nine other regional meteorological and hydrology service organisations), CARDI and the Caribbean Institute of Meteorology and Hydrology (CIMH). Agro-meteorological information is accessible directly from the TTMS' website.

Table 3.6: Qualities and findings for access to adaptation relevant information for the food production sector

Indicator	Quality	Evaluation	Findings
Actors in the priority area have access to adaptation-relevant information	The MET Office makes data available and usable to key actors in the priority area. (Transparency and Participation)	Yes	The Trinidad and Tobago Meteorological Service (TTMS) makes data available and in a usable format to key stakeholders. Key data are rainfall, temperature and wind. The data is presented in tabular format in either excel or word, and graphical format (Maps) or wind roses, which is a map of wind directions and speeds. The TTMS also has an agro-meteorological service for farmers available on its website.
	If data is not made readily available, there is a process for submitting a request for information. (Accountability and Enforcement)	Yes	Data is requested through the office of the Director of TTMS either by fax at 669-4009 or email at dirmet@tstt.net.tt . A formal request is made and it usually takes three (3) working days depending on the nature of the request.

Information analysis institutions

There is currently no platform for the exchange of climate information on the national level (CANARI, 2013). No platform exists for the food production sector.

3.2.5 Mainstreaming

Mainstreaming climate change in the Food Production sector

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 in 2013 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 project, which is currently in its implementation phase, is to contribute to the execution of the mitigation and the adaptation agendas for the country (IDB, 2013).

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.

Identification of barriers to adaptation

The Ministry of Food Production has not currently identified any barriers for climate change adaptation of the sector.

Table: 3.7 Status of indicators and recommended areas for advocacy for climate adaptation of the food production sector

Indicator	Status	Areas for advocacy
Vulnerability and Impact (V&I) Assessments	Limited V&I Assessments for the sector. Only one assessment of the economic impacts of climate change on agriculture in Trinidad and Tobago conducted by UNECLAC exists.	A more comprehensive V&I assessment needs to be undertaken for the food production sector. While this assessment should include economic impacts related to climate change there should also be significant focus on socio-cultural and environmental impacts. Consideration should also be given to how climate change will affect vulnerable groups (such as women, the poor and disabled) and vulnerable geographic locations.
Inventory of ongoing adaptation efforts	No inventory of existing or past adaptation efforts exists for the sector.	An inventory of climate change adaptation efforts should be established for the sector. The inventory should include projects that are proposed, planned and underway by government, private sector and civil society organisations. This would assist with preventing the duplication of effort and subsequent waste of resources (which may be limited). An inventory can also facilitate collaboration among government, academia, the private sector and civil society on projects with a shared focus. Most importantly, the inventory will help serve as an institutional history of lessons learned- understanding what works and what doesn't saves time and money.
Establishment of priorities	Climate change adaptation is not a stated strategic focus for the sector. Some initiatives that are related to climate adaptation do exist however. These initiatives were established by the line Ministry for the sector in collaboration and consultation	A process for identifying climate change adaptation priorities needs to be established. This process should be collaborative and transparent and include consultations with a wide range of stakeholders, including vulnerable groups. Establishing priorities would be most effective after a comprehensive vulnerability and impact assessment is undertaken. This would ensure that the full scope of environmental, socio-cultural and economic impacts is fully understood. Merely, establishing priorities based on economic factors, for example, may overlook key

	<p>with a wide range of internal and external stakeholders.</p>	<p>social or environmental issues, which could have adverse long-term implications. Implementing a participatory approach to establishing priorities will thus help to improve the scope of issues addressed and facilitate buy-in by stakeholders for projects and programmes.</p>
<p>Budget processes</p>	<p>Budgetary processes to channel finance to adaptation institutions exist for the sector. These include public sector and international financing. However, the Ministry of Finance and Ministry of Planning and Sustainable Development indicated that the Ministry of Food Production provides “insufficient justification for the quantum of funds requested (by the MFPLMA) and inadequate information to guide the process of budget adjustments (as well as) incomplete project proposals and related documents” This has resulted in the Ministry receiving less than requested funds to undertake their projects, which has affected the performance of the Ministry.</p>	<p>The Ministry of Food Production may have to collaborate with the Ministry of Finance and the Ministry of Planning and Sustainable Development to determine key areas of weakness in their proposals for funding. Once these have been identified, capacity building exercises can be undertaken to strengthen the ability of the Ministry to secure funding from the PSIP in order to undertake key projects for the sector related to climate adaptation.</p>

<p>Coordination in the sector</p>	<p>There is vertical (regional, global) and horizontal (between ministries) collaboration within the sector to undertake projects, some of which are related to climate change adaptation.</p>	<p>Coordination in the sector needs to be an integral part of operations. Currently, coordination and collaboration seem to occur mostly on an individual project basis. Additionally, by establishing formal policies and plans approved at Cabinet level, that include climate adaptation strategies for the sector, the GORTT can make better use of Technical Cooperation's from regional agricultural institutions, such as CARDI and IICA, that tend to align their work with established national priorities.</p>
<p>Data gathering</p>	<p>The TTMS provides the sector with data as requested. The TTMS also has an agro-meteorological forecast available on its website for farmers.</p>	<p>An independent institution with a specific mandate to address climate change issues or a unit within the Ministry of Food Production should be established to collect climate data that is relevant to the sector on an ongoing basis. As it is, data is only made available upon request and likely only requested on an individual project basis. Additionally the TTMS only provides rainfall, wind and temperature data. Whereas this is useful, data more relevant to the food production sector such as crop conditions, fish stock, environmental shocks, market analysis and nutrition would also be needed. The Ministry can also collaborate with academic institutions such as the University of the West Indies and the University of Trinidad and Tobago to collect data.</p>
<p>Information analysis institutions</p>	<p>There is currently no platform for the exchange of climate information on the national level. No platform exists for the sector.</p>	<p>There is a need to establish a platform for the exchange of climate information for the sector. This can be in the form of a website where stakeholders can have access to, as well as, share climate information. Such a platform will facilitate the timely delivery of updated information to all stakeholders.</p>
<p>Mainstreaming in the sector</p>	<p>There is currently no formal process or procedure for integrating climate change risk</p>	<p>The EMA is currently working on the inclusion of mitigation measures for green-house gas emissions in the CEC/EIA processes, however, climate change adaptation measures should also be considered.</p>

	<p>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 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.</p>	
<p>Mainstreaming adaptation in planning</p>	<p>The Ministry of Food Production has not currently identified any barriers for climate change adaptation of the sector.</p>	<p>An assessment of the barriers to effectively adapt to climate change needs to be undertaken for the sector. This assessment should consider, among other factors, legal, financial, political, infrastructural, institutional and social needs and constraints. It should be developed in consultation with a wide range of stakeholders from academia, civil society, government and the private sector.</p>

4. PRIORITY AREA – COASTAL ZONE OF TRINIDAD AND TOBAGO

4.1 Background

Like many other small island developing states (SIDS) the coastal zone of Trinidad and Tobago is a significant environmental, socio-cultural and economic asset. The nation's coastal zone supports a wide range of coastal ecosystems (e.g. mangroves, seagrass beds, coral reefs and beaches) that provide invaluable ecosystem goods and services, including coastal protection, flood regulation and nurseries/habitats for fish stocks. The main income earning activities of each island, oil and gas production in Trinidad and tourism in Tobago, also occur within the coastal zone. In addition to these, the coastal zone also supports other important economic activities, like agriculture and fishing. It has been estimated that about seventy percent (70%) of the nation's population resides within the coastal zone (Juman, 2010).

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. 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 (ICZM). 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 (IDB, 2013). As part of its work, the Committee will also focus on climate change adaptation in the coastal zone.

4.2 Findings from ARIA Phase II Survey

4.2.1 Assessment

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. Trinidad and Tobago's Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC), briefly identified certain coastal areas 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 Limited (PETROTRIN). The PETROTRIN assessments examined future sea level rise scenarios for three time periods 2031, 2051 and 2071 and projected the potential impacts of sea level rise and storm surges on coastal areas and infrastructure important to the oil and gas industry. Assessments were undertaken by PETROTRIN for the Oropouche Oil Field, the Pointe-a-Pierre Foreshore Area and the Vessigny to Cap-de-ville area. 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 (IDB,2013). The Steering Committee, chaired by the Institute of Marine Affairs (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)

Dr. Rahanna Juman, 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 (Juman, *pers.comm.*). 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.

Inventory of ongoing adaptation efforts

According to the findings of Phase I, there is no national inventory of existing and past adaptation efforts (CANARI, 2013). An inventory for the priority area does not currently exist.

4.2.2 Prioritization

Process for the establishment of priorities

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 includes considerations for climate change adaptation. The GORTT received approval in August 2013 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.

With respect to 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 in providing 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 (IDB, 2013). 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 (IDB, 2013).

Budget Processes

The work of the national ICZM Steering Committee receives budgetary support from the Inter-American Development Bank as well as from 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. The qualities of the budgetary processes for coastal zone management are evaluated in Table 4.1.

Table 4.1: Qualities and findings of budgetary processes indicator for coastal zone management

Indicator	Qualities	Evaluation	Findings
Budgetary processes exist to channel finance adaptation institutions or initiatives for the priority area.	The agency (ies) most closely tied to the priority area reflect adaptation initiatives in their annual budgets. (Comprehensiveness)	Yes	The work of the National Steering Committee for ICZM is being partially funded by the IDB. The funding lends support to a Cabinet appointed Committee in the execution of its mandate and so is aligned with established national priorities. The Committee also receives budgetary support from approved recurring funds under the IMA.
	Budgetary information for adaptation activities in the priority area is available and accessible. (Transparency & Participation)	Yes	Information regarding the budgetary grant from the IDB is available on the IDB's website at http://www.iadb.org/en/projects/project-description-title,1303.html?id=TT-T1038#.UmXmxXBzCFA . A detailed breakdown of the project budget is also available at the website above.
	Budgetary allocations are sufficient to enable adaptation activities to proceed according to plans. (Capacity)	Unsure	

4.2.3 Coordination

An initiative to improve coordination across all sectors, regarding environmental issues and notably climate change, is currently being undertaken by the Multilateral Environmental Agreement Unit (MEAU) of the MEWR. According to the Environmental Policy and Planning Division of Trinidad and Tobago (EPPD), in 2012, the MEAU sought to establish MEA Focal Points, nominated from relevant stakeholders in the public sector, NGOs and CBOs, to promote participatory management and decision making on national environmental issues. The key role of the MEA focal point will be to: liaise with the Ministry as the National Focal Point in respect of the role and functions of their respective institutions in the context of the national obligations under the various MEA

- provide advice and inputs into strategies and actions to be taken at the national level in the implementation of obligations under the MEA and climate change
- provide inputs, data and information to facilitate reporting requirements of Trinidad and Tobago under the MEA
- provide advice and inputs into work programmes of their respective Ministries/agencies in the context of national obligations under the MEA and climate change
- interface with other relevant stakeholders through relevant networking media to enhance co-operation at various levels

The MEAU hosted a one-day sensitisation and capacity building session in September 2012 -with a wide cross-section of stakeholders representing various sectors - toward the establishment of the MEA Focal Points, however, to date it has not been formally brought into being.

The work of the National ICZM Steering Committee, however, 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).

The Steering Committee includes a Thematic Working Group to address vulnerability assessments and climate change adaptation (IDB, 2013).

Table 4.2 evaluates the qualities of coordination for coastal zone management.

Table 4.2: Qualities and findings of coordination indicator for coastal zone management

Indicator	Quality	Evaluation	Findings
The priority area is included in national coordination efforts.	There is horizontal coordination (across ministries) as necessary, to carry out adaptation initiatives for the priority area. (Capacity)	Yes	The National Integrated Coastal Zone Management Steering Committee is a multi-sectoral committee comprised of twelve (12) members from various government ministries, state agencies and one civil society organisation with an interest in the coastal zone.
	There is vertical coordination (global, national, local) as necessary to carry out adaptation initiatives for the priority area. (Capacity)	Yes	The ICZM Steering Committee receives technical and financial assistance from the IDB.
	There is intersectoral coordination (between gov't, civil society, and/or business) as necessary to carry out adaptation initiatives for the priority area. (Capacity)	Yes	The ICZM Steering Committee has one civil society representative from the Council of Presidents of the Environment (COPE). *COPE is a grouping of autonomous, not-for-profit, non-governmental organisations (NGOs) and community based organisations (CBOs) representing specialist interests in environmental concerns.

Data Gathering

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. Table 4.3 evaluates the qualities of this function.

Table 4.3: Qualities and findings concerning access to climate information for coastal zone management

Indicator	Quality	Evaluation	Findings
Actors in the priority area have access to adaptation-relevant information	The MET Office makes data available and usable to key actors in the priority area. (Transparency and Participation)	Yes	The Trinidad and Tobago Meteorological Service (TTMS) makes data available and in a usable format to key stakeholders. Key data are rainfall, temperature and wind. The

			formats which are presented are either in tabular format in excel or word, graphical format (Maps) or wind roses which is a map of wind directions and speeds.
	If data is not made readily available, there is a process for submitting a request for information. (Accountability and Enforcement)	Yes	Data is requested through the office of the Director of TTMS either by fax at 669-4009 or email at dirmet@tstt.net.tt . A formal request is made and it usually takes three (3) working days depending on the nature of the request.

Information analysis institutions

There is currently no platform for the exchange of climate information on the national level (CANARI, 2013). 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.

4.2.4 Mainstreaming

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 (IDB, 2013). 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 (IDB, 2013).

Identification of barriers for 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 country's Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC) published in April 2013, identified certain technical skill and policy gaps that need to be addressed in order to effectively deal with issues related to climate change on a national level and within specific priority areas. The suggested actions from the SNC related to "Marine and Coastal Resources" are to:

- Promote the implementation of Chapter 17 of agenda 21 which provides the programme of action for achieving the sustainable development of oceans, coastal areas and seas through its programme areas of integrated management and sustainable development of coastal areas, including Exclusive Economic Zones, marine environmental protection, sustainable use and conservation of marine living resources, addressing critical uncertainties for the management of the marine environment and climate change, strengthening international and regional co-operation and co-ordination and sustainable development of small islands.
- Promote integrated, multidisciplinary and multi- sectoral coastal and ocean management at the national level.
- Develop ocean and coastal zone policies and mechanisms on integrated coastal zone management.
- Implement the work programme arising from the Jakarta Mandate on the Conservation and Sustainable use of Marine and Coastal Biological Diversity of the Convention on Biodiversity.
- Implement the RAMSAR Convention, including its joint work programme with the Convention on Biodiversity, and the programme of action called for by the International Coral Reef initiative to strengthen joint management plans and international networking for wetland ecosystems in coastal zones, including coral reefs, mangroves, seaweed beds and tidal mud flats
- Enhance protection of the marine environment from pollution by actions at all levels to *inter alia*, implement the conventions and protocols and other relevant instruments of the International Marine Organisation (IMO) relating to protection of the marine environment from marine pollution and environmental damage caused by ships, including the use of toxic anti-fouling paints.
- Improve the scientific understanding and assessment of marine and coastal ecosystems as a fundamental basis for sound decision making, through actions at all levels to, *inter alia*, increase scientific and technical collaboration, including integrated assessment at the global and regional levels, for the conservation and management of living and non living marine resources, and expanding ocean-observing capabilities for the timely prediction and assessment of the state of the marine environment.
- Build capacity in marine science, information and management through *inter alia*, promoting the use of environmental impact assessments and environment evaluation and reporting techniques, for projects or activities that are potentially harmful to the coastal and marine environments and their living and non-living resources.

Table 4.4: Status of indicators and recommended areas for advocacy for climate adaptation of the coastal zone

Indicator	Status	Areas for advocacy
Vulnerability and Impact (V&I) Assessments	The vulnerability and climate change adaptation working group of the National ICZM Steering Committee recently completed a report on coastal vulnerability and climate change in Trinidad and Tobago. This report is not yet available for public review.	
Inventory of ongoing adaptation efforts	No national inventory of existing and past adaptation efforts exist. An inventory for the priority area does not currently exist.	An inventory of climate change adaptation efforts should be established for the sector. The inventory should include projects that are proposed, planned and underway by government, private sector and civil society organisations. This would assist with preventing duplication of effort and subsequent waste of resources (which may be limited). An inventory can also facilitate collaboration among government, academia, the private sector and civil society on projects with a shared focus. Most importantly, the inventory will help serve as an institutional history of lessons learned - understanding what works and what doesn't saves time and money.
Establishment of priorities	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 includes considerations for vulnerability assessments and climate change. The approach will set	

	priorities, based on quantitative assessments and studies, in consultation with stakeholders.	
Budget processes	The GORTT, through the Ministry of Planning and Sustainable Development, received approval by the IDB for a non-reimbursable grant in the amount of five-hundred thousand US dollars (US\$500,000.00) for a Technical Cooperation to support the work of the ICZM Steering Committee. The work of the Committee is also financed by recurring funds under the IMA.	
Coordination in the sector	The work of the National ICZM Steering Committee represents the most significant efforts at coordination and collaboration regarding climate change adaptation initiatives for the coastal zone in Trinidad and Tobago. The ICZM Steering Committee is a multi-sectoral committee with representation from government agencies and the civil society.	It has not been articulated what measures for continued coordination for coastal zone management will be established once the National Steering Committee for ICZM completes its mandate and disbands. However, coordination across ministries should remain an integral part of the management of the coastal zone, especially as it pertains to climate change adaptation efforts.

<p>Data gathering</p>	<p>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.</p>	<p>A unit within the Institute of Marine Affairs should be established to collect climate data that is relevant to coastal zone management on an ongoing basis. In addition to rainfall, temperature and wind data collected by the TTMS, data relevant to the management of the coastal zone such as coastal water pH and temperature, rates of erosion, sea level changes and status of coastal ecosystems should also be collected and charted regularly. As it is, data is only made available upon request from the TTMS and likely only requested on a project basis. Collaboration with academic institutions such as the University of the West Indies and the University of Trinidad and Tobago to establish data collection programmes data will also be beneficial. Links should also be made or strengthened with regional institutions such as the CIMH that collect climatological data at the regional level.</p> <p>Data, analysis and findings should be widely shared and available to all stakeholders.</p>
<p>Information institutions</p>	<p>analysis</p> <p>There is currently no platform for the exchange of climate information on the national level. However, one of the expected outputs for the IDB funded <i>“Feasibility studies for a risk-resilient coastal zone management program”</i> project is the drafting of a Terms of Reference for the design of an integrated national coastal risk information platform.</p>	

<p>Mainstreaming in the sector</p>	<p>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.</p> <p>- Another Technical Cooperation Project between the IDB and GORTT 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 that will focus on recent trends in ICZM, including the integration of disaster risk management and climate change adaptation.</p>	<p>The EMA is currently working on the inclusion of mitigation measures for green-house gas emissions in the CEC/EIA processes, however, climate change adaptation measures should also be considered.</p>
<p>Mainstreaming adaptation in planning</p>	<p>A comprehensive report on the barriers to climate change adaptation in the coastal zone for Trinidad and Tobago does not currently exist. In its Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC), the Environmental Management Authority</p>	<p>A comprehensive assessment of the barriers to effectively adapt to climate change needs to be undertaken for the priority area. This assessment should consider, among other factors, legal, institutional, financial, political, infrastructural and social needs and constraints. It should be developed in consultation with a wide range of stakeholders. Proposed solutions (including cost-benefit analyses) should also be outlined to address identified barriers.</p>

	identified certain technical skill gaps and policy relevant actions that need to be addressed in order to effectively deal with issues related to climate change on a national level and within certain priority areas, including marine and coastal resources.	
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5. PRIORITY AREA- TOURISM

5.1 Background

Tourism in Trinidad and Tobago, like much of the Caribbean, relies significantly on the use of natural resources. Tobago's economy for example, depends heavily on revenues earned from, sun, sea and sand tourism. With the impacts of climate change already affecting many other 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.”

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

- i.) Ensure the conduct of Environmental Impact Assessments and obtaining of Certificates of Environmental Clearance, as necessary;
- ii.) Support the development of a national carbon reduction scheme to offset Trinidad and Tobago's contribution towards global warming;
- iii.) 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;
- iv.) Encourage the adoption of energy saving and other environmental best practices;
- v.) 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 climate change mitigation and promoting 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.

5.2 Findings from ARIA Phase II Survey

5.2.1 Assessment

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 organisation, 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. They are at the stage of awaiting formal requests from countries for the technical assistance to undertake the project (Medina, *pers. comm.*).

According to a statement received from CARIBSAVE by the Ministry of Tourism, follow up was recently conducted with the Ministry of Environment and Water Resources (MEWR) to submit a request for Trinidad and Tobago. This request, however, is yet to be submitted. Once the MEWR submits the request, an assessment of tourism, water resources and coastal areas will be undertaken (Medina, *pers. comm.*)

Inventory of Ongoing Adaptation Efforts

No national inventory of past or ongoing adaptation efforts exists (CANARI, 2013). No such inventory exists for the sector.

5.3 Prioritization

Process for the establishment of priorities

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

Budget processes

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 Programme (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 (Sawh, *Pers. Comm.*).

5.4 Coordination

The Ministry of Tourism is represented on the National ICZM Steering Committee. The Steering Committee, which is 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, includes a Thematic Working Group to address vulnerability assessments and climate change adaptation. 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 (Medina, *Pers. Comm.*).

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 Organisation (CTO) and the United Nations World Tourism Organisation (UNWTO). In addition to marketing support, these organizations provide technical support in terms of compiling and making available tourism statistics.

5.4.1 Information Management

Data Gathering

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. The qualities of climate information for the tourism sector are evaluated in Table 5.1.

Table 5.1: Qualities and findings for access to climate information for the tourism sector

Indicator	Quality	Evaluation	Findings
Actors in the priority area have access to adaptation-relevant information	The MET Office makes data available and usable to key actors in the priority area. (Transparency and Participation)	Yes	The Trinidad and Tobago Meteorological Service (TTMS) makes data available and in a usable format to key stakeholders. Key data are rainfall, temperature and wind. The formats which are presented are

			either in tabular format in excel or word, graphical format (Maps) or wind roses which is a map of wind directions and speeds.
	If data is not made readily available, there is a process for submitting a request for information. (Accountability and Enforcement)	Yes	Data is requested through the office of the Director of TTMS either by fax at 669-4009 or email at dirmet@tstt.net.tt . A formal request is made and it usually takes three (3) working days depending on the nature of the request.

Information analysis institutions

There is no national platform for the exchange of climate information (CANARI, 2013). No platform exists for the sector.

5.4.2 Mainstreaming

Mainstreaming climate change in the Tourism sector

There is currently no formal process or procedure for integrating climate change risk and adaptation into national projects or sectoral planning. However the GORTT received financing from the IDB for the institutional strengthening of the Environmental Management Authority 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 adaptation agendas for the country (IDB, 2013).

This 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.

Identification of barriers for adaptation

Neither the Ministry of Tourism nor the Tourism Development Company has identified any specific barriers for climate adaptation within the Tourism Sector in Trinidad and Tobago.

Table 5.2: Status of indicators and recommended areas for advocacy for adaptation of the tourism sector.

Indicator	Status	Areas for advocacy
Vulnerability and Impact (V&I) Assessments	No vulnerability and impact assessment to climate change for the tourism sector in Trinidad and Tobago currently exists.	A comprehensive V&I assessment needs to be undertaken for the tourism sector. While this assessment should include economic impacts related to climate change there should also be significant focus on socio-cultural and environmental impacts. Consideration should also be given to how climate change will affect vulnerable groups (such as women, the disabled and the poor) and vulnerable geographic locations e.g. the coastal zone.

<p>Inventory of ongoing adaptation efforts</p>	<p>No national inventory of past or ongoing adaptation efforts exists. No such inventory exists for the sector.</p>	<p>An inventory of past and ongoing climate change adaptation efforts should be established for the tourism sector. The inventory should include projects that are proposed, planned and underway by government, private sector and civil society organisations. This would assist with preventing duplication of effort and subsequent waste of resources. An inventory can also facilitate collaboration among government, academia, the private sector and civil society on projects with a shared focus. Most importantly, the inventory will help serve as an institutional history of lessons learned – understanding what works and what doesn't can save on time and money.</p>
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<p>Establishment of priorities</p>	<p>There are no specific activities geared toward climate change adaptation currently being implemented by the Ministry of Tourism or the Tourism Development Company (TDC).</p>	<p>A process for establishing climate change adaptation priorities for the sector needs to be established. This process should be collaborative and transparent and include consultations with a wide range of stakeholders, including vulnerable groups. Establishing priorities would be most effective after a comprehensive vulnerability and impact assessment is undertaken. This would ensure that the full scope of environmental, socio-cultural and economic impacts is fully understood. Merely, establishing priorities based on economic factors may overlook key social and environmental issues, which could have adverse long-term implications. Implementing a participatory approach to establishing priorities will thus help to improve the scope of issues addressed and facilitate buy-in by stakeholders for projects and programmes.</p>
<p>Budget processes</p>	<p>Budgetary processes exist to channel finance to adaptation institutions and initiatives through the PSIP.</p>	<p>Effective coordination and inter-sectoral linkages can facilitate the sharing of financial resources for adaptation initiatives that can benefit the tourism sector.</p>

<p>Coordination in the sector</p>	<p>The Ministry of Tourism is a member of the National Integrated Coastal Zone Management Steering Committee.</p>	<p>Coordination in the sector needs to be an integral part of operations. The fragmented structure of the tourism industry means that effective collaboration and coordination is critical for the successful establishment of adaptation initiatives. Decision makers in the tourism industry need to form strategic inter-sectoral linkages to ensure that the priorities of sectors important to tourism are aligned with the priorities for the tourism sector, in terms of adaptation. Coordination with CSOs, CBOs, regional and international tourism bodies will also facilitate the allocation of resources (which may be limited) to areas where they will add the most value in the context of a collaborative framework.</p>
<p>Data gathering</p>	<p>The Trinidad and Tobago Meteorological Service (TTMS) provides the sector with data as requested.</p>	<p>An independent institution with a specific mandate to address climate change issues should be established to collect weather and climate forecasting data for the sector on an ongoing basis. As it is, data is only made available upon request and likely only requested on an individual project basis. Collaboration with academic institutions such as the University of the West Indies and the University of Trinidad and Tobago to collect data should also be considered. Links with regional institutions such as the CIMH that collect regional climatological data should also be established or strengthened.</p>

<p>Information analysis institutions</p>	<p>There is currently no platform for the exchange of climate information on the national level. No platform exists for the sector.</p>	<p>There is a need to establish a platform for the exchange of climate information for the sector. This can be in the form of a website where stakeholders can have access to, as well as, share climate information. Such a platform is especially important for the tourism industry as it depends on many sectors to function effectively. Having a platform to share and receive information from other sectors can assist with the development of strategic climate adaptation actions within the tourism sector, based on up to date relevant information.</p>
<p>Mainstreaming in the sector</p>	<p>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.</p>	<p>The EMA is currently working on the inclusion of mitigation measures for green-house gas emissions in the CEC/EIA processes, however, climate change adaptation measures should also be considered.</p>

<p>Mainstreaming adaptation in planning</p>	<p>No barriers to climate change adaptation have been identified for the sector.</p>	<p>An assessment of the barriers to effectively adapt to climate change needs to be undertaken for the sector. This assessment should consider, among other factors, legal, financial, political, infrastructural, institutional and social needs and constraints. It should be developed in consultation with a wide range of stakeholders from academia, civil society, government and the private sector.</p>
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