



CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE (CCCCC or the CENTRE)

TERMS OF REFERENCE

FOR THE

INVESTIGATION INTO CLIMATE CHANGE DATA MANAGEMENT

IN THE

EASTERN AND SOUTHERN CARIBBEAN (ESC)

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

CLIMATE CHANGE ADAPTATION PROGRAM (USAID CCAP)

USAID PROJECT NO. 538-RDOAG-DO3-2015

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1. INTRODUCTION

Global climate change is arguably the most serious challenge to the development aspirations of Caribbean region. During the 20th century the Caribbean's mean temperature increased by approximately 0.6 degrees Celsius, mean sea level rose between 2 and 6 mm/yr during the period and rainfall variability has increased. It is estimated that 60% of the Caribbean population live within 1.5 kilometres of the coast, making them particularly vulnerable to rising sea levels and its attendant threats such as salt water intrusion and a reduction in and increasing scarcity of freshwater resources, deteriorating coastal conditions through beach erosion and coral bleaching which adversely affect local resources, livelihoods, and reduce their value as tourist destinations. Floods, storm surge, erosion and other coastal hazards, exacerbated by sea-level rise also threaten vital infrastructure, settlements and facilities that support the livelihoods of island communities.

Other natural hazards have impacted the region and are expected to increase in intensity. On the basis of the vulnerabilities of marine and coastal ecosystems, a change of 1.5°C is seen as the critical threshold. Climate change related events are already profoundly impacting the region's geophysical, biological and socio-economic systems, depleting national budgets, compromising livelihoods and exacerbating poverty. According to the United Nations Framework Convention on Climate Change (UNFCCC) Fifth Assessment Report (2014) these natural hazards are expected to grow in intensity in the future.

The effects of the hurricanes of 2017 in the Caribbean serve as a stark reminder of the region's vulnerability not only to the long-term effects of climate change but also to the very real and ever-present threat of the increasing frequency and impacts of extreme weather events. Resilience building therefore becomes one of the region's pivotal imperatives as it pursues the challenging goal of climate resilient development. Fortunately, the CARICOM region has had the foresight to institute a regional platform to address the vagaries of climate change and climate variability and its impacts on national and regional development.

2. BACKGROUND

To adequately respond to the threats of climate change and climate variability, the Caribbean region must be able to identify and quantify climate change-related vulnerability and risks. The absence of adequate data is a constraint to accurately assessing vulnerability as well as implementing informed adaptation actions across the region. The unavailability of data impedes the region's ability to be proactive in implementing adequate and appropriate measures to address climate change and climate variability.

Many Caribbean States need to strengthen their data capture and management capabilities, critical for informing among other things emissions targets. As such, it is imperative that ESC States be assisted in generating and managing sector specific data. Over time, technical capacity, sectoral inventories, and nationwide environmental data nodes will be developed, making any type of future emissions controls easier to monitor.

Acquired data must be transformed into useable information to have relevance to users and meet requirements in a timely manner. The transformation from a business-as-usual approach to the adoption of evidence-based decision-making must be supported at many levels and by the various institutions that are mandated to support the management of data instrumentation across the region, provide services and technical guidance, provide information, and facilitate capacity building within their respective mandates. The effective transformation is only possible if an aggressive and long term process for enhancing knowledge is embraced and implemented. The current available data in these areas is fragmentary at best. Consequently, the scope and accuracy for assessing climate change-

related vulnerability in all the major economic and social sectors inclusive of agriculture, tourism, water and health, as well as implementing informed adaptation actions in the region are very limited.

Meteorological and environmental data are scattered over several institutions and locations making it difficult for countries to, *inter alia*, complete their National Communications and State of the Environment Reports. A national data node with responsibility for collecting and archiving these data in one central and accessible location will greatly improve the efficiency of the preparation process for reports and facilitate appropriate evidence-based decision making. Furthermore, there is an urgent need to continue building the capacity in the region for the collection and analysis of data using a range of space-based techniques. This will aid in an expansion of the overall knowledge base on climate change impacts and associated physical and economic vulnerabilities while simultaneously seeking to develop interventions to mitigate such impacts.

There is increasing demand for hydro-meteorological data by a diverse group of users and sectors in the region, but the current hydro-meteorological network in the region is not sufficient to meet the required coverage and need. Hydro-meteorological data such as wind speed and direction, air temperature, relative humidity, barometric pressure, precipitation, solar radiation, and water levels (both historical and current) are essential drivers of the regional climate models (RCMs) used to project future climate in the region. The use of observed data is critical to testing of the RCMs used in research by the climate scientists at the University of the West Indies (UWI) Mona, Institute of Meteorology of Cuba (INSMET) and other regional institutions. The data and the climate models are also used to support peer reviewed research by scientists for inclusion in the IPCC Assessment Reports and other publications on climate change impacts in the Caribbean. Hydrometeorological Stations within the network that meet the World Meteorological Organisation (WMO) specifications are also contributing data to the Global Climate Observation System (GCOS).

Coastal topographic and bathymetric information are among the critical inputs needed for assessing the vulnerability of coastal areas to the impacts of sea level rise, storm surge and flooding. Yet, coastal topographic and bathymetric data is among the least available. For example, the conduct of coastal vulnerability assessments and research work on storm surge impacts is hampered by the absence of near shore bathymetric data and appropriate topographical maps of sufficient resolution and quality. Access to coastal data through remote sensing imagery for use with decision making tools such as geographic information systems (GIS) is especially critical for coastal resources management in the region. The provision of data on coastal resources will allow for better decisions on how to manage development and settlements in these very vulnerable areas.

Data and information have direct application for example, in the agriculture, water resources, coastal zone, tourism and health sectors. For example, farmers are provided with periodic precipitation forecasts which they use to select crops and plan their planting cycles. Fishers, tourism business and water resources managers also use hydro-meteorological data to support the decision-making component of their enterprises; while atmospheric and environmental data is used as an early indicator of climate-related illnesses.

The dearth of and accessibility to critical data has been identified as a constraint to the timely completion of vulnerability assessments in ESC countries. Earlier vulnerability impact assessments of coastal areas from storm surge could not be completed due to the paucity of near shore bathymetric data and appropriate topographical maps of sufficient resolution and quality. The proposed use of airborne and space-based systems to provide the required coastal data will remove this impediment. In addition, vulnerability and capacity assessments (VCA) were limited to a few sectors due to inadequate data. Most Caribbean countries are only able to conduct VCAs through regional or internationally funded projects because of the inadequate human and financial resources.

In order to inform decision-making on feasible adaptation options there are some key steps that need to be undertaken. Firstly, the climate risk to which countries is responding needs to be defined providing answers to questions such as what the future climate in the region is likely to be. The latter information derives from the work of the already well established regional climate modelling network. These modelling exercises require a range of historical and current hydro-meteorological and socioeconomic data to ensure the usefulness of the projections which inform decisions on adaptation responses. Unfortunately, with respect to hydro-meteorological data, as far as historical data goes, much is missing and some of what exists is only available in non-digitised handwritten formats. Analog data can easily be lost through fires or other events if efforts are not made to "rescue" such data sets. As far as current hydro-meteorological data is concerned, there is, throughout the region, a lack of sufficient coverage (i.e., an insufficiency of hydro-meteorological stations) with the result that there are critical gaps in our knowledge about the multiple micro-climates that exist in countries across the ESC region. The same is true for other instrument-driven data capture systems.

The paucity of data compromises the integrity of the projections from the climate models and the level of confidence that can be placed in such projections. By extension, the chances that decisions on adaptation options would be flawed are high simply because the evidence to support the decision is inadequate. Outputs from climate models allow for the development of realistic climate scenarios which are then used to modulate sectoral impact models (e.g. water, agriculture, health, storm surge) and to conduct vulnerability and capacity assessments of the respective sector. From these exercises one can then determine the extent of the impacts caused by the exposure of the vulnerable element to future climate and on this basis identify adaptation options for strengthening the resilience of the specific element under examination. Cost benefit/cost effectiveness analyses of these options then provides the decision maker with a more objective basis for deciding on the appropriate course of action.

Under the leadership of the CCCCC, and in collaboration with regional partners, such as the Caribbean Institute of Meteorology and Hydrology (CIMH), Climate Studies Group (CSG) of the University of the West Indies (UWI) and the regional climate modelling network, advances have been made in the downscaling of global climate models to provide outputs that have been utilized in the conduct of sector-based vulnerability and impact assessments in the region. The assessments have been used to develop sector adaptation strategies that have since been utilized by some national governments to inform their development plans and to mobilize resources for the execution of specific recommendations. There is an urgent need to continue building the capacity of the region for the collection and analysis of vital data using a range of space-based techniques. This will aid in an expansion of the overall knowledge base on climate change impacts and associated physical and economic vulnerabilities.

In addition to existent Impact models the process of identifying adaptation options is further supported by the development of a range of tools which allow for the integration of climate risk into national development planning, the generation of site specific climate scenarios and the analysis of extreme events (e.g. droughts, storms) all facilitating decisions on proactive application to cope with climate impacts. To date the challenge is to disseminate information on the availability and utility value of these tools to relevant stakeholders and to build their capacity in the application and use of these tools. Enhancing the functionality of the CCCCC Regional Clearinghouse Database by expanding its database architecture is therefore important to influencing the adoption of evidence-based decision-making tools and instruments. This is also true for institutions such as the CIMH that provide a range of climate services for its members and is required to improve the integrity of its own database and network.

It is also recognised that there is a definite need for harmonisation of climate change projections at both national and regional levels. Some researchers consider it helpful for the region to have a single, publically web-accessible repository of climate change projections. These could then be nationally

endorsed for use in all relevant studies (e.g. strategic planning, engineering design). It is thought that this would be instrumental in helping to minimise duplication of effort both in terms of climate modelling, and for practitioners and regulators using the data for planning purposes. The UK for example operates a single web portal for climate projections for use by anyone. These represent best practice and are required for use by the relevant regulatory bodies. It is therefore straightforward for practitioners to identify and access officially mandated projections.

In attempting to address deficiencies in the data observation networks, a regional Database Management System (DMS) was installed at the Centre through an InterAmerican Development Bank (IDB) funded project titled the *Database Management System for a Regional Integrated Observing Network for Environmental Change in the Wider Caribbean*. That project which ran from 2011 – 2015 recognised that the region lacks an integrated observing network that can enable comprehensive assessment of environmental change at regional and national levels. Various sensors have been deployed across the region, but the data output is disparate. For the time being there are no regional controls over data products. The core of such a network is a regional Database Management System (DMS) that will provide standardized data products useful for analyzing, predicting and forecasting environmental changes (oceanographic, atmospheric and ecological) and trends in the region.

The need for such a regional DMS was informed by previous initiatives in the region which sought to address the impacts of climate change as well as integrated coastal management and watershed planning. These initiatives included the Caribbean Planning for Adaptation to Climate Change (CPACC) and the Mainstreaming Adaptation to Climate Change (MACC) projects, implemented by the Caribbean Community (CARICOM) from 1997 to 2001 and 2002 to 2007 respectively. An important outcome of these efforts was the further recognition by CARICOM countries of the need for data and information that can improve the understanding of environmental change and impacts of sea-level rise at the national and regional levels in support of effective decision making on climate change adaptation.

The output of the Database Management System project is a web-based application hosted by the Centre and managed by CIMH. The platform which is called the *Caribbean Regional Environmental and Atmospheric Data (C-READ)* system is accessible through current browsers and caters for:

- I. Improved access to data, data products and decision support tools for addressing climate and other environment changes at the regional and national level;
- i. Increased regional and national level institutional capacity for knowledge based decision making and for mainstreaming climate information into this process; and
- ii. A framework for the establishment and operational implementation of an integrated regional observation network for monitoring environmental change in the Caribbean.

The C-READ platform has just been recommended as the communication platform for the ongoing work of a “Multi-institutional Task Force on Climate and Disaster Resilient Energy Supply” on building a more robust architecture for energy including electric grids in the region.

Notwithstanding all of the above-mentioned advances and deficiencies, countries are yet to define comprehensive protocols for data sharing, either across departments within the same ministry, across ministries, or with entities outside of government circles. Sharing with the private sector is more problematic as fee structures (if applicable), national benefits or private sector benefits are not defined. Current practice is that government entities are usually reluctant to release data or information to the private sector. It is all the aforementioned issues that must be addressed to inform a harmonized code of practice for data management at national and regional levels.

The recent acquisition of the data capture equipment for the countries in the Eastern and Southern Caribbean (ESC) imposes an imperative for an effective protocol for data and information management in the Caribbean. The addition of 50 automatic weather stations (AWS) to be deployed across the ESC; 5 Coral Reef Early Warning Systems (CREWS) stations in five countries; and the acquisition of a Light Detection and Ranging (LIDAR) remote sensing system will significantly elevate the volume of generated data to unprecedented levels. This will impose additional loads on the data repositories and online systems at national and regional levels requiring even more robust procedures to satisfy user needs.

3. THE CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE (CCCC OR THE CENTRE)

Officially opened in August 2005, the Centre was established to coordinate the region's response to managing and adapting to the impacts of climate change. In support of this role, the Centre is also host to the largest repository of information and data on climate change specific to the region. The Centre is recognized by the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), the United Nations Institute for Training and Research (UNITAR) and other international agencies as the focal point for climate change responses in the Caribbean. The Centre plays an essential role in providing climate change-related policy advice and guidelines to CARICOM member States.

The Centre engages in collecting, analyzing, storing, retrieving and disseminating atmospheric and environmental data relevant to the observation of climate change, and in collaboration with specialized regional agencies such as the CIMH, facilitating the collection of information on the effects of climate change on the economic sectors of the Caribbean in order to achieve its objectives.

The work of the Centre is driven by the Caribbean Community's (CARICOM) 2009-2015 *Regional Framework for Achieving Development Resilient to Climate Change (Regional Framework – currently under revision)*, and the *Implementation Plan (IP)* to the *Regional Framework* which defines the region's actions for coping with climate change for the period 2011 – 2021.

In July 2015 the Centre was accredited to the Green Climate Fund (GCF) and is now eligible to submit project proposals/programmes valued at US\$10 – 50 million per project/programme. The Centre has since been working with countries to develop concepts and proposals for submission to the GCF and other international sources of financing. The Centre however continues to receive support for resilience-building activities from international agencies and governments such as the USAID Climate Change Adaptation Program (USAID CCAP) under which this activity is funded.

4. THE USAID CCAP

On July 12, 2016, United States Agency for International Development (USAID) issued Regional Development Assistance Agreement No. 538-RDOAG-DO3-2015 to the Caribbean Community Climate Change Centre to implement the Climate Change Adaptation Program (USAID CCAP), a 4 year \$25.6 million USD activity, through to September 2020. The change in the US Administration's stance on Climate Change led to a reduction in the overall package of the USAID CCAP to US\$10 million and to conclude in September 2019. USAID CCAP aims to address climate change challenges in 10 Eastern and Southern Caribbean (ESC) countries¹.

¹ ESC countries are: Antigua and Barbuda; St. Kitts and Nevis; Dominica; Saint Lucia; St. Vincent and the Grenadines; Barbados; Grenada; Trinidad and Tobago; Guyana and Suriname.

The goal of the USAID CCAP is to reduce risks to human and natural assets resulting from climate change vulnerability. The Program recognizes that for climate change impacts to be sustainably addressed within the ESC region, a robust system is required that can produce climate change data, incorporate this data into decision making at various levels (Component 1); design and implement innovative adaptation sub-activities that can be replicated and scaled up where necessary (Component 2); and generate sustainable financing for scaling-up and replication beyond the scope of this USAID funded Program (Component 3). The need for the integration of these functions of data generation, development, and testing of innovative adaptation approaches, and sustainable financing is critical since each of these functions reinforces, supports, and complements each other.

The USAID CCAP will comprise three integrated outputs to achieve its purpose. These are:

- a) Using climate data and information in decision-making,
- b) Demonstrating innovative adaptation approaches and proof of concept necessary to secure international financing, and,
- c) Securing climate financing for the scale-up and replication of cost effective and sustainable adaptation initiatives.

Component 1 of the USAID CCAP invests heavily into data capture platforms through the provision of:

- Fifty (50) automatic weather stations across the Member States of the ESC (with the exception of Trinidad and Tobago);
- Five (5) Coral Reef Early Warning System (CREWS) stations in Antigua and Barbuda, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines and Grenada;
- 5 sets of data rescue equipment/data nodes in St. Kitts and Nevis, Antigua and Barbuda, St. Lucia, Grenada and Guyana;
- A Light Detection and Ranging (LIDAR) system that will be utilised to provide high resolution bathymetric and topographic data for the entire region and which will be available on an as needed basis at much lower costs than similar contracted services from outside the region.
- An upgrade of processing and storage devices for data processing and modelling data outputs, the development of an off-site backup storage facility, the establishment of a website for online access to data.
- A Memorandum of Agreement (MOA) between the CCCCC and CIMH for the long-term management and support for the operations of the Automatic Weather Stations procured and installed in the ESC countries under the USAID CCAP.

The combination of these instruments will serve to enhance the network of data capture systems across the ESC. The enhanced data collection and information systems, which will include on-line user-friendly assessment tools, will enable the generation of more and better support for evidence-based decision-making.

The Program will further build and strengthen the capacity of regional, national, and local partners to generate and use climate data and information for application at these different levels of decision-making. The Program will work to strengthen the data system in which the CCCCC will serve as the central node while engaging other key partners like the CIMH, UWI, National Oceanic and Atmospheric Administration (NOAA) and others to deliver on specified areas of generating, storing, processing, interpreting, and disseminating climate data and information.

5. OBJECTIVES

The objective of this consultancy is to develop a platform for the effective management of climate related data in the ESC region and beyond.

6. PURPOSE

The purpose of this consultancy is to investigate the many issues facing data management, from data capture to evidence-based decision making, and to determine an appropriate and effective suite of solutions in the form of a protocol (or other mechanism).

Data under this consultancy relates to observed hydrometeorological data (weather variables, stream flows, groundwater levels, water quality data, ecological data etc), as well as projections from climate models. However, given the obvious linkages between climate related data and other sectors, the study will draw on the linkages between climate data and other pertinent data to provide the necessary recommendations for inclusion into a protocol.

7. TASKS

7.1 General Tasks

The geographic scope of the USAID CCAP is the Eastern and Southern Caribbean States and it is anticipated that the emphasis will be on those countries particularly as it relates to information harvesting exercises. However, since the issues surrounding data capture, quality, standardisation, management, conversion to information, storage and sharing to name a few are common to all CARICOM member States, the consultant will not be limited to the information emerging from the ESC but will also use electronic or other means for capturing information from countries outside of the ESC that would inform the outputs of this consultancy. In implementing this exercise, the consultant is expected to fully understand the climate data management landscape and historical approaches to addressing data management deficiencies within the region. Some of this is captured in reports of past projects as well as in current initiatives under the auspices of the CIMH, the Japan-Caribbean Climate Change Partnership project (J-CCCP), EU-Glocal Climate Change Alliance (EU-GCCA) project, DMS, the Caribbean Agro-Meteorological Initiative project (CAMI), and others.

This consultancy is expected to investigate data collection (instrumentation, quality assurance, etc.); data management (database management archiving, digitisation of records, production of metadata), and data usage (licensing, web accessibility, user needs). It will be important for the consultant to understand the user perspective as well as the provider including the political economy of data sharing, especially at the national and regional level.

Detailed consideration should be given to:

- a) Data capture methods and storage protocols across the ESC and wider Caribbean in addition to standards, quality, sharing within country and outside (regionally). This needs to take into consideration the work done under the DMS (see background above) and the current hydromet network administered by the CIMH.
- b) The quantum of data captured, and the current need, use and demand for data/information;
- c) The value and utility of the data currently captured by national and regional entities;
- d) How effective and efficient is the current practice of converting data into information; what demand there is for climate related data and information; sources of climate information and data; what is the data and information used for; and what formats, if any, would users wish to receive information and how regularly?

- e) How effective/efficient are the existing platforms for capturing data?
- f) The barriers to the effective use of data/information including the absence of effective protocols for data sharing, storage, information generation, use, etc?
- g) The roles of national and regional entities in data management.
- h) What is required to address the weaknesses/deficiencies in data management within the region?

The methodology for the information capture will utilise a variety of approaches and may involve literature reviews, consultations with focus groups, discussions with regional organisations, questionnaires, one-on-one discussions or other information capture methods as deemed necessary. Funding for this activity will not allow for visits to all the countries in the ESC. In-country activity will therefore be limited to the following as proxies: Antigua and Barbuda, Barbados, Saint Lucia, Grenada and Guyana. Barbados is particularly strategic as the host country for institutions such as the CIMH, the UWI including CERMES and other entities that mine or manage data. The consultant will engage with other stakeholders through electronic or other means.

The assessment will produce a visual representation of producer and user relationships to describe the Caribbean climate change data and information landscape. The visualization will show connections between producers and end users in a way that would identify gaps in relationships. The assessment will make recommendations for strengthening existing relationships, closing gaps by creating new relationships, or both.

7.2 Specific Tasks.

Task 1. Project Inception – Estimated work effort - 2 days.

- a. An inception meeting shall be held in Belmopan in the offices of the CCCCC (or virtually) to establish the program of work, confirm schedules and activity requirements, seek clarification on issues pertinent to the exercise, and to plan the logistics for the implementation of the exercise. This first meeting will also serve to establish an understanding of the environment within which this exercise is to be undertaken and the culture of data management and practice in the region as a precursor to the national and regional consultations.

Task 2. Initial Review – Estimated work effort - 13 days

- a. The consultant will undertake literature reviews (desk and otherwise) of the various reports on data capture and management in the region. This will be useful in serving as a baseline against which other findings will be positioned. The consultant will also hold discussions with regional agencies and other entities with data management responsibilities, which will include the Caribbean Institute of Meteorology and Hydrology (CIMH), the Climate Modelling Group (University of the West Indies and its partner agencies), the Centre for Resource Management and Environmental Studies (UWI CERMES) the Caribbean Agricultural Development and Research Institute (CARDI), the Caribbean Public Health Agency (CARPHA), the Caribbean Regional Fisheries Mechanism (CRFM), and the OECS Commission, the Caribbean Natural Resources Institute (CANARI), the Global Water Partnership Caribbean (GWP-C) CARICOM Secretariat and The Caribbean Electric Utility Services Corporation (CARILEC), the Caribbean Water and Waste Water Association (CWWA), and the Caribbean Water and Sewerage Association (CAWASA).
- b. The initial review will capture information that should include detailed descriptions of services, existing and potential gaps, information on current projects related to climate change data and information, who produces information, intended uses, regional support institutions/agencies, as well as existing and potential partnerships with other donor entities.

Task 3. Detailed Assessment. Estimated level of effort - 45 days

- a. The consultant should also identify producers and users of climate change data and information at national and regional levels. This step would revisit the existing network under Component 1 of the USAID CCAP and will also identify new producers and users. These reviews will serve as resources to profile the climate change data and information landscape in the Caribbean. The information gleaned above may contain information not restricted to:
 - Name of organization
 - Status (public, private, other)
 - Points of contact and email addresses
 - Table of services provided / used
 - Table of sectors served / working in
 - Table of countries served / working in
 - URLs to key information.
- b. The consultant will conduct investigations into factors relating to data and information management that will include: data capture; standardisation; quality; rigor; the state of and usefulness of instrumentation; storage; sharing protocols; conversion into information; use by decision-makers, researchers; and national level management.
- c. The consultant will also examine the effectiveness and adequacy of existing climate change data networks within the region and propose recommendations for improvements to the data and information management architecture to support evidence-based decision making at national and regional levels. This examination shall also include national central repositories on climate change data and information, regional repositories such as those belonging to CIMH, CARDI, CDEMA, CARPHA and others, as well as the Regional Clearing House climate repository at the CCCCC.
- d. The consultant will also examine other international frameworks/protocols on (climate) data management such as that of the EU and United States and determine how regional and national protocols on climate data management might be affected. Recommendations on how impacts are to be dealt with should be provided by the consultant.

Task 4. Operational Platform. Estimated level of effort – 15 days.

- a. The consultant shall develop a protocol for data management which should contain a costed action plan with measurable steps and targets, and an assessment of risks.
- b. The consultant will also provide recommendations for an enabling environment and the functional requirements and obligations for a platform that would facilitate the effective implementation of the protocol for climate data and information management at national and regional levels.

8. PROJECT MANAGEMENT

The Caribbean Community Climate Change Centre is the Contracting Authority and is responsible for the implementation of the project.

9. QUALIFICATIONS AND KEY EXPERTISE

The consultancy is to be undertaken by a qualified individual who is a national and resident of the USA and CARICOM/CARIFORUM and eligible for consideration under GeoCode 937 USAID CCAP funding stipulations.

The Consultant should possess general experience and proven track-record in the management of climate and associated data, and thoroughly understand the landscape of data management issues at national and regional levels in the region. That landscape should include the entire spectrum of data parameters from instrumentation installation and management to the provision of climate services and the development of projections from regional climate models.

The selected Consultant(s) is required to possess the minimum competency requirements listed hereunder.

The selected Consultant will be ultimately responsible for all required/specified documentation, reports to 5Cs, and assume responsibility for all activities geared towards achieving the objectives of this terms of reference.

A. SPECIFIC AREAS OF EXPERTISE/EXPERIENCE

For this assignment the relevant indicative experience is expected to include but not limited to:

- i. A thorough understanding of the impacts of climate change and climate variability with at least 5 years in fields associated with climate data management, which will include:
 - a. a demonstrated understanding of the development of national and regional data management platforms and initiatives aimed at improving climate data management in the region; and
 - b. a demonstrated understanding of the barriers to the effective and efficient management of climate data capture, sharing and storage in the region;
 - c. a proven understanding of the linkages between sectors, between ecosystems, and between anthropogenic and ecological systems and the data requirements associated with these linkages;
 - d. a thorough understanding of the use of such data and information in informing climate resilience building decisions;
 - e. a demonstrated understanding of the science surrounding climate change projections and forecasting and the role of global and regional climate models in informing evidence-based decision making;
 - f. a clear understanding of the decision-making architecture in the region from the level of CARICOM Heads of Government to national and local level institutions.

B. GENERAL PROFESSIONAL EXPERTISE/EXPERIENCE

- i. Proven expertise and in-depth knowledge of the political, social, economic and natural environment landscapes in the Caribbean and the threats posed to them by climate change.

- ii. The Consultant should hold at a minimum a master's degree or its equivalent in their respective areas of expertise (economics, environmental engineering, environmental sciences, marine ecosystems, sustainable development, climate change or other relevant fields).
- iii. Prior working experience in the Caribbean is an asset.

10. OUTPUTS AND DELIVERABLES

The consultant will deliver the following outputs:

- 1 **An Inception Report that shall outline the schedule of activities, methodology for the execution of the exercise including country visits and target audience.**

The Inception Report of no more than 5 pages shall specify: the methodology to be deployed in the exercise; target audience; identification of countries to be visited; milestones; information requirements; summary of agreed issues to be investigated; administration requirements and roles of Centre personnel and that of the consultant; potential barriers to the conduct of the exercise and suggested approaches to mitigating the impacts. This report will trigger the first payment to the consultant and shall be produced no later than 3 working days following the Inception Meeting.

- 2 **A Brief Mid-Term Report outlining the state of progress of the activity. This report shall include findings, challenges, responses from agencies/organisations/Member States, and the way forward towards the completion of the report.**

Interim reports of maximum 10 pages that will provide an update on the consultancy and shall include: A brief synopsis on the findings to date; difficulties encountered; alternative approaches to addressing difficulties towards the completion of the exercise; countries visited; stakeholders consulted; and a succinct description of the way forward. This report shall be submitted no later than 40 working days following the submission of the Inception report. An electronic copy of each interim report will be presented to the CCCC for review and inputs. The acceptance of the interim report is a pre-condition for the payment of each corresponding invoice, except for the final payment.

- 3 **A Final Report** with a description of findings and recommendations.

The final report will present the findings of the exercise with the main output the draft national and regional protocol for climate data and information management. The report will provide a synopsis of the difficulties encountered during the consultancy and the approaches adopted for their mitigation. More detailed information on the analytical process engaged during the exercise, including stakeholders met can be included in annexes. The final report must be provided along with the corresponding final invoice.

- 4 **A Recommended Protocol for data management within the region and platform for implementation.**

The protocol will contain both national and regional approaches for comprehensive data management and the transitional linkages from national to regional.

- 5 **Submission and approval of reports**

The reports referred to above must be submitted to the Program Manager identified in the contract. The Program Manager is responsible for approving the reports and authorizing invoices for payment.

11. LOCATION AND IMPLEMENTATION PERIOD

11.1 Location

The project is to be carried out in the recipient countries specified by the Centre and may be adjusted over time based on project implementation conditions. It is expected that the consultant will work from their home base.

11.2 Commencement date and period of implementation of tasks

The intended commencement date is September 24th 2018 and the period of implementation of the contract will be 120 days from this date. (Total level of effort is 75 working days).