



Caribbean Community Climate Change Centre

TERMS OF REFERENCE

Consultancy to Prepare an Integrated Needs Assessment: Water Usage, Accessibility and Storage Needs in Barbados

I. BACKGROUND

Beneficiary country

Barbados, like many small island developing states (SIDS), cannot ignore the overwhelming impact of climate change and the need to engage in adaptive and mitigation strategies to slow or retreat the deleterious effects climate change is having on our land and its development.

Current State of Affairs

This consultancy is related to the effectiveness of the funded activities agreement, by of the board of directors of the Green Climate Fund (GCF), associated with the project titled, “Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)”. This project was developed through collaboration between the Government of Barbados, Barbados Water Authority (BWA) and the Caribbean Community Climate Change Center (CCCCC).

WSRN S-Barbados Project Brief

Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados) was conditionally approved at the 19th sitting of the GCF board and was expected to have commenced implementation in September, 2018. The idea underpinning WSRN S-Barbados is to transform Barbados’ society into one that is more aware of the water cycle and climate change impacts threatening the island’s drinking water supply, create resilience to severe weather impacts, reduce greenhouse gas emissions, reduce consumption, and promote appropriate uses of diverse water sources and legislation to support climate smart development and water sector resilience.

The WSRN S-Barbados objectives are:

- To build greater resilience to extreme storm events and drought conditions by utilizing cleaner energy sources, decentralising water storage, promote rainwater harvesting at the household and community level, and improve the efficiency with which rainwater runoff replenish aquifers in Barbados.
- To further advance adaptation and mitigation initiatives in the water sector of Barbados by redirecting and mobilising local funds through a revolving adaptation fund.
- To reduce the greenhouse gas emissions intensity of water provision by integrating renewable energy with back-up natural gas turbines and sustainable Water Loss Reduction (WLR) initiatives.
- To contribute to capacity building via knowledge sharing and lessons learnt platforms within communities, educational organizations, private sector, civil society, BWA and the Government of Barbados to manage and monitor water resources.

- To support the review and development of a legislative framework to supports climate smart development and water sector resilience.
- To collate and disseminate lessons learnt for use in developing further adaptation and mitigation initiatives and raising public awareness about climate change, water conservation, recycle and reuse, the revolving adaptation fund, Green Climate Fund and in general this project.

The associated outcomes of the WSRN S-Barbados project to this consultancy are as follows:

- one thousand five hundred (1,500) potable water storage tanks (1.5 -2.5 m³) for the differently abled households installed at houses
- one (1) potable storage tank (223 m³) installed at the Queen’s Elizabeth Hospital (QEH)
- nine (9) potable storage tank (7.5 m³) installed at the polyclinics
- sixteen (16) potable storage tank (12 m³) installed at primary schools (minimum 1 per parish)
- eight hundred (800) homes retrofitted with rainwater harvesting systems
- twenty-two (22) schools retrofitted with rainwater harvesting systems
- twenty (20) community centers retrofitted with rainwater harvesting systems
- one hundred and twenty-one (121) Farms retrofitted with rainwater harvesting systems

At a community level, this project will directly positively impact the communities in which it is being implemented as well as the broader network of customers that BWA supplies water to. The project will engage with households to raise greater awareness and put into practice water conservation techniques as well as promote actions and technologies that will lead to greater efficiency in storage and use. Vulnerable households (differently able and ailing) will benefit directly through efforts to decentralise storage by installing personal tanks. Barbados sole public hospital will also benefit through increase storage for emergency purposes as well as several schools and polyclinics. Several farmers will benefit by increasing rainwater harvesting and incorporating this into their irrigation systems. These actions coupled with efforts to sensitise the public about climate change and variability and its impact on the water sector and other sectors will result in a paradigm shift in the monitoring, distribution, storage and utilisation of water resource. Indirectly, it will benefit the entire population of Barbados by creating an enabling environment that is investor friendly and cleaner.

The overarching goal is to increase access to sustainable and safe water supply and general access to sanitation for poor, vulnerable communities, children in school and in health facilities in Barbados. However, for this to be achieved a needs assessment should be conducted to identify the most suitable vulnerable households that have had their water storage and accessibility potential negatively impacted by climate change. Therefore, this Integrated Needs Assessment is to identify the needs with respect to the above outcomes and identify the potential locations of the installations, with justifications and design recommendations for the proposed designated system.

The total component will implement a personal tank and rainwater-harvesting programme, which will consist of a needs assessment and survey to determine the most vulnerable physically, financially, and in terms of water shortages. The geo-coded survey will ascertain and record information such as, existing service location, identify tank location, access restrictions, type of, and size of installation (pre cast or in situ), special conditions etc. It will also provide the opportunity to inform the customer of their responsibilities prior to installation. Depending on the

tank size and requirements, possible renewable energy alternatives (e.g. solar powered water pump *inter alia*) for powered pumps will also be identified for potable storage tank and the rainwater harvesting systems.

II. OBJECTIVE OF CONSULTANCY

The objective of the present Terms of Reference is to *define the services, terms and conditions for producing an Integrated Needs Assessment to identify the Water Usage, Accessibility and Storage Needs in Barbados to identify the Most Vulnerable Households, polyclinics, schools, communities and farmers in Barbados for participation in a Water Storage and Rainwater-Harvesting (RWH) programme.*

The consultancy should:

- (1) identify aims and objectives of the Personal Tank and RWH Programme;
- (2) identify options and integrated solutions for smart, sustainable, and energy- efficient water supply, sanitation, that use low-carbon technology, geographic information systems, and information technology solutions, including climate change adaptation and mitigation options with indicative incremental costs for the personal tank and RWH programme;
- (3) identify vulnerable households, polyclinics, schools, communities and farmers in Barbados, with respect to water accessibility, in conjunction with the relevant local government departments and agencies, and relevant civil society partners;
- (4) Document past initiatives to promote RWH programmes, including system designs in the region in general and for water and sanitation and in particular (lessons learnt/challenges-performance, technical constraints, costs, and benefits of RWH);
- (5) Assess the suitability/appropriateness of various Personal Tank and RWH options (in use in the region or to be introduced) based on the socio-economic context, intended use and users (considering communities, households, gender, and traditional knowledge).
- (6) Develop draft guidelines for the selection, design, construction, operation and maintenance of appropriate Personal Tank and RWH systems in Barbados;
- (7) conduct a study to determine the potable water needs of the most vulnerable households, polyclinics, schools, communities and farmers in Barbados negatively impacted by climate change;
- (8) Complete the needs assessment analysis;
- (9) Compile the outcomes of the needs assessment report differentiating between the personal tanks and rainwater harvesting systems and compile and deliver relevant field reports;
- (10) determine governance and administration of each programme;
- (11) identify potential financial partners;
- (12) determine eligibility for application; and
- (13) develop a monitoring, reporting and accounting methodology.

III. SPECIFIC TASKS AND RESPONSIBILITIES

The consultant will produce an Integrated Needs Assessment entitled “**Water Usage, Accessibility and Storage Needs**”, and present the major findings of this needs assessment to stakeholders. To aid the execution of this consultancy the project core team (CCCC, BWA, UWI, and USF) will provide the following:

- a. Provide the Consultant with the proposal entitled “Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados).”

- b. Provide the Consultant with any documents requested that are readily available and accessible for sharing.
- c. Facilitate major meetings with major stakeholders requested by the consultant (consultant would include costs in her/his budget).
- d. Organize conference call meetings (weekly) between the consultant and the project core team (CCCCC, BWA, UWI, and USF) to address any questions or concerns and to provide updates about progress made on the study.
- e. Organize a meeting for the project results to be presented to stakeholders.

From the above information provided to the Consultant, the consultant is to prepare a document entitled “**Integrated Needs Assessment: Water Usage, Accessibility and Storage Needs in Barbados**” as defined in the Scope of the Consultancy. Thus, the needs assessment should include, but not limited to, definitions and procedures for the following:

1. Executive Summary
2. Introduction:
 - a. General description and importance of the Integrated Needs Assessment;
 - b. Context
 - c. Barbados’ demographics
 - d. Water resources, rainfall and water storage
 - e. Mapping
 - f. General Hydrogeology of the Barbados
 - g. Policy framework
 - i. Eligibility Criteria for households
 - h. Sanitation
 - i. Objective of the assessment
 - j. Significance of the Integrated Needs Assessment
 - k. Facilitating factors
 - l. Limitations
 - i. Including associated energy requirements
3. Methodology
 - a. Sampling method
 - b. Sample frame
 - c. Data collection
 - d. Data synthesis
4. Findings
 - a. General
 - b. Water and Sanitation
 - i. Household and Community survey findings
 - c. Findings from selected sites
5. Institutional Framework
 - a. Key stakeholders
6. The Water Storage Programme
 - a. The BWA’s current Personal Tank Programme
 - i. Current situation and projections
 1. Design of tank system
 - a. Gravity operated
 - i. Three design scenarios based on location

- iv. sixteen (16) primary schools (minimum 1 per parish) for potable storage tank (12 m³) to be installed
 - v. eight hundred (800) homes to be retrofitted with rainwater harvesting systems
 - vi. twenty-two (22) schools to be retrofitted with rainwater harvesting systems
 - vii. twenty (20) community centers to be retrofitted with rainwater harvesting systems
 - viii. one hundred and twenty-one (121) Farms to be retrofitted with rainwater harvesting systems
 - b. Proposed interventions
 - c. Lessons Learnt
12. Phase out strategy of the PTP, RWH and storage at institutions and farms

IV. DELIVERABLES

The main deliverables of this consultancy shall include:

1. **An electronic Inception Report including a workplan** (with timelines for accomplishing specific tasks) and an inception meeting with core project team will be held within the first two (2) weeks of contract award.
2. **An electronic Draft Mid-Term Report titled, “Integrated Needs Assessment: Water Usage, Accessibility and Storage Needs in Barbados”** submitted within the first twelve (12) weeks of contract award. This report will focus mainly on the personal tanks program and augmented storage needs and must include:
 - a. Introduction:
 - i. General description and importance of the Integrated Needs Assessment;
 - ii. Context
 - iii. Barbados demographics
 - iv. Water resources, rainfall and water storage
 - v. Mapping
 - vi. General Hydrogeology of the Barbados
 - vii. Policy framework
 - b. Eligibility Criteria for households
 - i. Sanitation
 - ii. Objective of the assessment
 - iii. Significance of the Integrated Needs Assessment
 - iv. Facilitating factors
 - v. Limitations
 - c. Methodology
 - i. Sampling method
 - ii. Sample frame
 - iii. Data collection
 - iv. Data synthesis
 - d. Feedback from core project team and other stakeholders.
 - e. Initial Findings
 - i. General
 - ii. Water and Sanitation
 - iii. Household and Community survey findings

1. Findings from selected sites
2. Institutional Framework
3. Key stakeholders
- iv. The Water Storage Programme
 1. The BWA's current Personal Tank Programme
 2. Current situation and projections
 3. Design of tank system
 - a. Gravity operated
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 - b. Pump operated
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 4. Current limitations
 - a. Cost
 - b. Energy
 - c. Location
 - d. Water availability
- f. Challenges to implementation
 - i. Risk coverage – clear definitions of risk coverage;
- g. Conclusions and recommendations
 - i. Recommendations
 1. one thousand five hundred (1,500) differently abled households for potable water storage tanks (1.5 -2.5 m³) to be installed
 2. one (1) potable storage tank (223 m³) to be installed at the Queen's Elizabeth Hospital (QEH)
 3. nine (9) polyclinics for potable storage tank (7.5 m³) to be installed
 4. sixteen (16) primary schools (minimum 1 per parish) for potable storage tank (12 m³) to be installed
 - h. Proposed interventions
 - i. Lessons Learnt
 - j. Any other updates deem necessary to the Draft Mid-term Report.
3. **A Presentation of the Draft electronic Mid-Term Report** to the core project team and other major stakeholders. This report will focus mainly on the finding presented for the PTP and future works planned.
4. **A Draft Final electronic Report titled, "Integrated Needs Assessment: Water Usage, Accessibility and Storage Needs in Barbados"** will be conducted within twenty-two (22) weeks of contract award and the Final Report will be submitted within twenty-four (24) weeks of the contract. This report will incorporate the comments received during the presentation of the draft final report and also differentiate between, and identify the compatibility of the personal tank and rainwater harvesting systems and must incorporate:
 - a. Feedback from core project team and other stakeholders.
 - b. Any other updates deem necessary to the Draft Report.

- c. An executive summary that highlights the most important findings (maximum 2 pages)
- d. The final report may have the following format:
 - i. Executive Summary
 - ii. Introduction:
 - a. General description and importance of the Integrated Needs Assessment;
 - b. Context
 - c. Barbados demographics
 - d. Water resources, rainfall and water storage
 - e. Mapping
 - f. General Hydrogeology of the Barbados
 - g. Policy framework
 - h. Eligibility Criteria for households
 - iii. Sanitation
 - iv. Objective of the assessment
 - v. Significance of the assessment
 - vi. Facilitating factors
 - vii. Limitations
 - a. Methodology
 - viii. Sampling method
 - ix. Sample frame
 - x. Data collection
 - xi. Data synthesis
 - a. Findings
 - i. General
 - ii. Water and Sanitation
 - 1. Household and Community survey findings
 - iii. Findings from selected sites
 - b. Institutional Framework
 - i. Key stakeholders
 - c. The Water Storage Programme
 - i. The BWA's current Personal Tank Programme
 - 1. Current situation and projections
 - 2. Design of tank system
 - a. Gravity operated
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 - b. Pump operated
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 - 3. Current limitations
 - a. Cost
 - b. Energy
 - c. Location

- d. Water availability
- i. The Proposed Rainwater Harvesting Programme
 - ii. Current situation and projections
 - iii. Design of RWH system
 - a. Gravity operated for water use
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 - b. Pump operated for water use
 - i. Three design scenarios based on location
 - ii. Three design scenarios based on cost
 - iii. Three design scenarios based on storage size
 - c. Current limitations
 - i. Cost
 - ii. Energy
 - iii. Location
 - iv. Water availability
 - d. The Proposed Storage Plan for Public Institutions
 - i. Locations of Schools, Polyclinics and Community Centers
 - ii. Needs of identified institutions
- d. Guidelines for the selection, design, construction, operation & maintenance, for all storage tanks and RWH systems.
- e. Community participation and governance
- f. Coordination, partnership and collaboration
 - i. Water and Environmental Sanitation Coordination (WESCOORD)
 - ii. Partners
- g. Challenges to implementation
 - i. Risk coverage – clear definitions of risk coverage;
- h. Conclusions and recommendations
 - i. Recommendations
 1. one thousand five hundred (1,500) differently abled households for potable water storage tanks (1.5 -2.5 m³) to be installed
 2. one (1) potable storage tank (223 m³) to be installed at the Queen’s Elizabeth Hospital (QEH)
 3. nine (9) polyclinics for potable storage tank (7.5 m³) to be installed
 4. sixteen (16) primary schools (minimum 1 per parish) for potable storage tank (12 m³) to be installed
 5. eight hundred (800) homes to be retrofitted with rainwater harvesting systems
 6. twenty-two (22) schools to be retrofitted with rainwater harvesting systems
 7. twenty (20) community centers to be retrofitted with rainwater harvesting systems
 8. one hundred and twenty-one (121) Farms to be retrofitted with rainwater harvesting systems
- i. Proposed interventions

- j. Lessons Learnt
- k. Phase out strategy of the PTP, RWH for all proposed installations and storage at institutions

V. METHODOLOGY

The methodology for developing a report titled “**Integrated Needs Assessment: Water Usage, Accessibility and Storage Needs in Barbados**” must include:

- a. Review of documentation including but not limited to:
 - i. Project documents, including past, ongoing and pending implementation by the BWA.
 - ii. guidelines and GCF related templates and guidelines.
- b. Consultation with Core Project Team and other major Stakeholders including:
 - i. Barbados Water Authority (BWA)
 - ii. Ministry of Energy and Water Resources
 - iii. Ministry of People Empowerment and Elder Affairs
 - iv. Caribbean Community Climate Change Centre (CCCCC)
 - v. University of the West Indies (UWI)
 - vi. University of South Florida (USF)
- c. Additional data/information including:
 - i. Existing primary data (survey and customer data) that the BWA might possess.
 - ii. Existing secondary data in Barbados and the wider Caribbean.

Engagement with stakeholders and presentation of findings of the draft report can be done using an internet-based platform.

VI. LOCATION AND DURATION OF ASSIGNMENT

The consultant assigned experts are expected to work from their own office space. If an international or regional consultant is selected, travel to Barbados is required for a minimum of 1 trips x 10 weeks or 2 trips for a total of 8 weeks for consultations. This assignment is not anticipated to be of more than twenty-four (24) weeks.

VII. QUALIFICATIONS AND KEY EXPERTISE {GENERAL AND SPECIFIC}

The assignment is to be undertaken by an eligible and qualified consultant(s).

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

The selected Consultant may sub-contract any portion of the assignment with the written consent of the Centre, but will be ultimately responsible for all required/specified deliverables to the Centre, as well as assume responsibility for all activities geared towards achieving the objectives of this terms of reference. In addition, The Consultant must specify the qualifications and relevant experience of each specialist to be assigned to this assessment.

For the purpose of this assessment, the relevant indicative experience for the assignment is expected to include but not limited to:

SPECIFIC AREAS OF EXPERTISE/EXPERIENCE/QUALIFICATION

- 1. Lead Consultant: *Water Sector Management*.** The Team leader will coordinate the work of the team and have primary responsibility for the outputs of the assignment. He/she is expected to have the following expertise and qualifications.
 - Master's Degree in Water or General Management, Engineering, Public Relations, Marketing, Sociology, Economics or other related fields;
 - Expertise working with vulnerable households with at least 8 years proven of work experience in a similar/related field of endeavor; and
 - Demonstrated experience listed below would be an asset: (i) Public and community relations, (ii) Public-Private Partnerships and (iii) General Marketing and Advertising.

- 2. Consultant #2: *Social Scientist/Analysis*** should have the following expertise and qualifications:
 - Master's Degree in Social Science, Sociology, Economics or other related fields; and
 - At least 5 years proven experience working with vulnerable communities and individuals that may be particularly disadvantaged when it comes to accessing water due to (i) sex and gender; (ii) race, ethnicity, religion, birth, caste, language, and nationality; (iii) disability, age and health status and (iv) property, tenure, residence, economic and social status

- 3. Consultant #3: *Civil Engineering/ Construction Management*** should possess the following mix of expertise and qualifications:
 - Master's Degree in Engineering or Construction Management or other related fields;
 - At least 5 years proven experience in preparing detailed engineering drawings for water storage and harvesting systems; and
 - At least 5 years' experience in installing or managing water harvesting/storage/distribution systems

VII. GENDER COMMITMENTS

The WSRN S-Barbados Project has a Gender Action Plan (GAP). The GAP aims to be congruent with the Commitments of the established Gender Action Commitments of the Green Climate Fund, which states:

“By adopting a gender-sensitive approach in its mandate on climate change, the Fund commits to contributing to gender equality, as enshrined in international agreements and national constitutions, and other human rights agreements.”

Thus, the consultant is required to identify, in their application, the gender representation of both females and males.