



CARIBBEAN COMMUNITY CLIMATE CHANGE CENTRE

(CCCCC or the CENTRE)

TERMS OF REFERENCE

for the Consultancy to conduct

An Environmental and Social Impact Assessment (ESIA)

and

Environmental and Social Management Plan (ESMP)

THE R'S (REDUCE, REUSE AND RECYCLE) FOR CLIMATE

RESILIENCE WASTEWATER SYSTEMS IN BARBADOS

(3R CREWS BARBADOS) PREPARATION PROJECT

GREEN CLIMATE FUND (GCF) PROJECT PREPARATION FUND NO.022 (PPF 022)

1. BACKGROUND

The Government of Barbados, Barbados Water Authority (BWA) and the Caribbean Community Climate Change Centre (CCCCC) is developing a Green Climate Fund (GCF) project aimed build climate resilient into the wastewater systems of Barbados. The projects address challenges facing the wastewater systems particularly those caused and exacerbated by climate change. Through a concerted effort, the BWA wastewater division propose to support increased adaptation and resilience to climate change in Barbados by introducing mechanisms which reduce our carbon footprint and greenhouse gas emissions and, in so doing, set a standard and example for the Caribbean in waste to energy utilization and proper wastewater management for reuse.

Barbados is vulnerable to Climate Change and its devastating impacts. Of these, the impact of drought has made a significant impact on Barbados, which is now ranked one of the 15 most water stressed countries worldwide. Over the past 6 years, Barbados has experienced drastically decreasing ground water levels and elevating salt levels. Potable water production has reduced by as much as 3 million gallons per day during the most severe drought periods. Increased salinity has also afflicted Barbados and unprecedented increased salinity has been recorded in several wells, as a result of saline intrusion. During droughts Barbados experience decreasing underground recharge rates of its aquifers, further increasing salt concentrations, which provide 95% of the island's potable water. Sea-level rise for Barbados is projected at ca. 5 to 10 mm/yr and is complicated by vertical crust changes due to tectonic processes, thus decreasing the utilization of coastal aquifers. Increased flash-flooding magnitude and frequency has caused havoc in Barbados. In December 2016 Barbados experienced over 6 inches of rainfall in a couple hours, which was only previously observed in 1995 and this contributed to the failing of the sewerage system.

Excess nutrients contribute to nutrient loading in near-shore environments and negatively impact Barbados natural coral reef defence barriers. Moreover, there has been movement of the coastal topography due to coast and beach erosion, and this is likely to be exacerbated by sea-level rise, that threaten tourism which is important to livelihoods, especially those in the fisheries industry. The coral reefs function as natural breakwaters along the coasts of Barbados. They also provide habitats for marine animals and reef fish, generating significant revenues for many island economies through tourists interested in snorkelling and scuba diving. It is widely understood that much tropical biodiversity is unlikely to survive without adequate above ground freshwater sources, that are reduced due to the decrease in the islands changing topography due to land movement that therefore reduces the ability of the land to retain and maintain the surface waters that support these natural aquatic habitats for these species. To this effect recycling and reuse of water may be necessary to provide water courses for the seasonal birds and other migratory organisms that require inland aquatic habitats.

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. Barbados has been ranked as one of the 15 most water stressed countries in the world (PAHO 2012). During the drought Barbados experienced decreasing underground recharge rates of its aquifers, which provides some 95 % of the island's potable water. As a result of drought conditions the Government of Barbados, through the Barbados Water Authority (BWA), imposed restrictions on the use of potable water, for essential purposes only. This was to mitigate the loss of internal renewable water resources (IRWR), however, to date there is no

indication as to whether the measure has been able to deliver the results of improved management of IRWR.

Central to the context presented above is the wastewater systems of Barbados. There are currently two Sewage Treatment Plants on the island – The Bridgetown Sewage Treatment Plant and the South Coast Sewage Treatment Plant. The Bridgetown Plant utilises Secondary Treatment of waste, removing all suspended and dissolved solids by combining them with activated sludge. The South Coast Plant, however, only treats waste to a Primary stage. In the Bridgetown system, there are 4 Lift Stations and 1 Seawater Pump Station, all in St. Michael, while the South Coast system includes 5 Lift Stations – 2 in St. Michael and 3 in Christ Church. Both Treatment Plants discharge the effluent water out to sea but the sludge generated from the Bridgetown Plant is disposed of on land. The waste from the South Coast (rags etc. captured in the system) is collected in a 'skip' and disposed of in the island's landfill. Building resilience and addressing the climate hazard affecting these plants will enable the systems to function efficiently and effectively. On the other hand, adopting systems that enhances the wastewater systems enables the country to access water resources that otherwise would not have been put into productive use. This would help to alleviate some of the water scarcity issues, which are exacerbated by climate change, affecting the island. These actions will also complement ongoing activities aimed at building climate resilience in the water sector of Barbados.

It is against this background that the CCCCC has secured project preparation funding from the Green Climate Fund (GCF) Project Preparation Facility (PPF) to develop a full funding proposal for a project titled, "The R's (Reduce, Reuse and Recycle) for Climate Resilience Wastewater Systems in Barbados (3R-CReWS)". The GCF, which is the climate finance mechanism set up under the UNFCCC framework to promote **the paradigm shift towards low-emission and climate-resilient development pathways**, provides a unique opportunity for countries, such as Barbados, to develop and implement climate change directives to adapt to the related impacts. The GCF Project Preparation Facility (PPF) ensures that countries who would like to apply for the GCF's funding present all the information necessary to make a fair judgment on the merits of their proposed project. In some situations, it may be unusual for some countries, such as Barbados, to have this information readily available with all the requirements that would merit a complete Funding Proposal Application (FPA) to the GCF. To ensure that the 3R-CReWS FPA would have all the studies and information available for presentation to the GCF, the Government of Barbados, BWA and CCCCC requested funds from the GCF PPF to properly conduct these studies.

It is against this background that the CCCCC is seeking a qualified Consulting Firm to deliver some of the required studies and shape the final Funding Proposal Application to GCF, i.e. An Environmental and Social Impact Assessment and Environmental and Social Management Plan. The outputs of this assignment should be aligned with the environmental and social safeguards of the GCF and CCCCC as well as aligned as much as possible with the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability.

2. OBJECTIVE

The main objective of this consultancy is to deliver an Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) aimed at

ensuring that Performance Standards on Environmental and Social Sustainability are mainstream into the final project design of the project titled, "The R's (Reduce, Reuse and Recycle) for Climate Resilience Wastewater Systems in Barbados (3R-CReWS)".

3. SCOPE OF WORK

This consultancy is intended to complement the project design and technical, financial and economic feasibility, which is current being conducted under another consultancy. This consultancy will review the draft reports of the consulting firm and examine from an environmental and social lens the initial project design and make recommendations to ensure compliance with environmental and social safeguard policies and standards as well as propose actions for mainstreaming environmental and social considerations. As part of the ESIA and ESMP, the Consulting firm is expected to conduct wide ranging consultations with key stakeholders, with keen attention to environmental and social safeguards and review relevant background information in order to identify the potential environmental and social implications and recommend actions to mitigate these potential impacts, which will include a holistic or wide ranging capacity assessment.

The indicative tasks, list of activities to be undertaken and issues to be studied, report on, and recommended approaches to realize the expected objectives and outputs of this assignment shall include, but is not limited to:

3.1 Task 1:

Conduct a desk review and produce a Baseline Study of the issues related to environmental and social parameters that must be taken into consideration for the project under consideration. This task involves the review of the present environmental and social management practices of the BWA's to identify and assess any environmental and social risks that are associated with the BWA's Wastewater Division existing operations. This review shall allow the BWA to better understand the present situation in the environmental and social terms. The baseline study should identify the potential respective needs and concerns of different disadvantaged groups and/or those with less voice, such as women/financially disadvantaged. This baseline study will help to shape the ESIA and ESMP, which will detail the environmental and social considerations that must be addressed in the design, implementation, and monitoring and evaluation of the project. The baseline environmental (bio-physical, social) description of the project setting will include both the direct and indirect areas of influence. This should include the following aspects; water quality, overview description of the wetlands in the vicinity of the project areas, avifauna and other animal groups, population (including identification of vulnerable groups), economic activities, air quality and climatic conditions amongst others. Additionally, a capacity needs assessment of BWA and its partners to implement and operate the project is necessary and must be done as part of the desk review process.

3.2 Task 2:

Conduct an Environmental and Social Impact Assessment (ESIA) which includes eight inter-related activities:

1. Document existing environmental and social baseline information in the project areas and their surrounding areas;
2. Evaluate project options and advise on the most appropriate option taking into account, a combination of environment and social dimensions;

3. Describe project activities that will be undertaken during implementation of project works;
4. Review national, regional and international policies, legal and administrative frameworks relevant to the development and implementation/operation of the project;
5. Conduct project public consultations and describe disclosure requirements;
6. Identify the negative environmental and social impacts of the project based on project activities and operations and propose feasible mitigation measures to address such impacts;
7. Give detailed inputs in the development of an Environmental and Social Management Plan (ESMP) and define the institutional structure to guide the implementation of the ESMP;
8. Provide a set of detailed recommendations for the project design, implementation and operations to avoid and/or minimize the negative impacts and maximize the positive impacts of the project.

The Consulting Firm shall prepare an ESIA for the project areas and the roads connecting the wastewater treatment facilities. In addition, the Consulting Firm will be required to carry out the following tasks to complete the technical assessment component:

1. Provide an environmental and social impact justification for the project considering national and regional integration development strategies amongst others;
2. Provide detailed baseline hydrological information for the two sites considering the anticipated works and their implications on the hydrology of the Graeme Hall Swamp and other wetlands.
3. The hydrological assessment should focus on reviewing the hydrological information and data for the proposed sites against anticipated project works and establish hydrological dynamics of the project sites based on scenarios such as with and without the project as advise on the suitability of the sites, levels of works amongst others on the lake water dynamics, uses and values;
4. Identify concisely the uses, users and values of the project sites against the planned development plans and assess implications of the development on those uses, users and values;
5. Identify and review national, regional and international policies, legislations and institutional and administrative frameworks governing social and environment management and relating to the project. The Consulting Firm should pay attention to Barbados' protocols relating to environment and natural resources management in the review process in the ESIA;
4. Identify and provide a description and an evaluation of possible project alternatives in terms of the technology, design and layouts, levels of works in the works and location consideration of the project sites. The assessment of alternatives should cover assessment of the sites, routes and alignments for the project infrastructures. An analysis for each alternative in terms of cost and technical feasibility should be given and the best option justified. The analysis should include parameters considered along with weightage criteria for short-listing selected site;
5. Conduct ecological evaluation of the available project alternatives to compare their viability taking into account a number of considerations such as environmental costs, ecological values and uses and inherent opportunity costs against each of the alternatives; Present the preferred project design option, based on the technical and ecological alternatives evaluation.
6. Describe development activities to be undertaken in the project and map out key environmental and social impacts of the project in terms of their extent, duration and

reversibility. The ESIA should provide matching feasible mitigation measures for such impacts;

7. Assess and recommends solutions for noise and vibration effects associated with the construction and operation of the proposed facilities. The assessment process should focus into various activities including construction related traffic movements; construction operations and the future operations of the wastewater treatment plants. Atmospheric conditions that may affect noise levels include humidity, wind direction, and wind speed. The noise assessment should be based on equivalent ambient noise levels that should not be exceeded and general recommendations for prevention and control of noise are described in the General ISO Guidelines;
8. Propose protocols for handling proper screening, acceptance, and transport of dangerous cargo based on local and international standards and regulations, including elements such as establishment of segregated and access-controlled storage areas with the means to collect or contain accidental releases; loading and unloading to and from ships, including proper shipping measures amongst others. Emergency response procedures specific to dangerous goods should be outlined in the ESIA;
9. Identify wastes from the implementation and operations of the project. These should include details of the processes for each activity, generation of wastes, types, quantity and methodology for collection, storage, treatment and disposal of wastes. Wastewater water-based effluents associated with port and pier activities, bilge and waste, ship sewage and vessel cleaning wastewater from ships. Ship sewage and wastewater contains high levels of BOD and coliform bacteria, with trace concentrations of constituents such as pharmaceuticals, and typically low pH levels. Wash water may contain residues such as oil. Pollutants in bilge water contain elevated levels of BOD, COD, dissolved solids, oil, and other chemicals that accumulate as the result of routine operations. Therefore, measures for effective management of such effluent waste should be outlined in the ESIA study;
10. Occupational health and safety issues during the construction, operations and decommissioning of ports are to be outlined in the ESIA in line with OHS requirements for large infrastructure in line with internationally acceptable practices and standards such as General recommendations for managing physical hazards as addressed in their General EHS Guidelines. This should comprehensively cover among others protections against, exposure to dust and hazardous materials that may be present in construction materials and demolition waste and a host physical hazards associated with the use of heavy equipment, or the use of explosives in line with this nature of project;
11. Undertake Risk Assessment and propose a Disaster Management Plan including emergency evacuation during natural and man-made disaster like floods, cyclone and or earthquakes amongst others;
12. Assess and recommend solutions for implications of possible dredging, quantities of dredged materials and measures for their safe transportation and disposal. This process should consider implications of the project on the neighbouring ecosystem uses and values in the areas where dredging is to be undertaken;
13. Assess and recommends solutions for the direct and indirect impacts of the planned project activities on the environment and propose mitigation measures;

3.3 Task 3:

Prepare an Environmental and Social Management Plan (ESMP) detailing the environmental and social risks in a Risk Registry and identify measures for addressing potential negative environmental and social impacts/risks of the project (for guidance see ESS policy of the

CCCCC, Annex 5, Section C). The ESMP should clearly identify institutional roles, responsibilities and costs for realising the mitigation measures proposed. Additionally, the ESMP should include a Monitoring Plan with clear monitoring indicators and institutional roles to be used in tracking the implementation and compliance of the proposed mitigation measures.

4. DELIVERABLES

The Consulting Firm shall produce during the assignment the following reports, inter alia:
The main deliverables of this consultancy include:

- I. Inception Report**, an inception meeting with core project team will held within first week of contract award.
- II. Draft and Final documents**, including annexes, for:
 - a. Baseline Report**
 - b. Environmental and Social Impact Assessment (ESIA)**
 - c. Environmental and Social Management Plan (ESMP)** including a Risk Registry and Monitoring Plan with clear monitoring indicators and institutional roles.
- III. Presentation of Draft and Final Reports** associated with 2a-2b.

The principal output (s) of this Assignment shall include, inter alia a comprehensive report based on the scope of works and specific activities outlined below. The report shall provide a basis for future decision making in respect of the project. The reports and plans must conform to the following minimum requirements:

- Must be a comprehensive straightforward document that can be used in discussions with potential partners, the community, government, service providers and others to prove/provide evidence of the feasibility of and obtain support for the development of the project.
- It must/should contain a time-bound roadmap/blueprint for pursuing recommendations emanating from this assignment
- Data and information in the report must be presented in an analytical manner and address the issues highlighted below
- The final ESIA must comply with the environmental and social standards adopted by the Government of Barbados, CCCCC, GCF and aligned as much as possible with the IFC Performance Standards on Environmental and Social Sustainability.
- The final report must be submitted to the CCCCC for approval and agreement prior to finalization.

5. METHODOLOGY

An interactive, consultative and participatory approach is a requirement to achieve the deliverables. The selected Consulting Firm should propose a detailed methodology to undertaking the service. Although a detailed methodology is required, the consultants are expected, at the minimum, to become familiar with the various strategic documents related to environmental and social safeguards of the GCF, CCCCC (the ESS Policy and all its performance standards where relevant), Government of Barbados and Barbados Water Authority. It is also important that this consultancy engages with the population of Barbados to collect pertinent information (primary and secondary data collect) to development the Environmental and Social Management Plan. The proposed approach to this consultancy should indicate the team lead that will be responsible for the consultancy and day-to-day

engagement with the CCCCC. It should also detail the roles and responsibilities, person-days and proposed timeline for execution of activities necessary to realise the deliverables set out in the previous section. In conducting the ESIA report and developing the ESMP, the Consulting Firm must utilise the relevant aspects of the CCORAL tool, the VCA Methodology and the PRECIS 25 km resolution model or other down scale climate model.

6. QUALIFICATIONS AND KEY EXPERTISE

The assignment is to be undertaken by a suitably qualified Consulting Firm. The selected Consulting Firm may sub-contract any portion of the assignment with the written consent of the CCCCC, but will be ultimately responsible for all required/specified deliverables to the CCCCC, as well as assume responsibility for all activities geared towards achieving the objectives of these terms of reference.

6.1 General Areas of Expertise/Experience

The Consulting Firm is expected to demonstrate expertise in the following areas:

- 10 years of experience conducting environmental impact assessments, environmental analyses or research in the field of environmental life cycle impacts and climate change, environmental sustainability, environmental science, environmental engineering, ecosystem services management, environmental and or other field relevant to environmental sustainability and climate change;
- Track-record assessing, engineering, executing, operating and/or maintaining water and or wastewater systems;
- Evidence of a strong track record preparing high-level documents and reports for at least 5 similar assignments;
- Proven ability to generate and sustain ongoing consultation and meaningful participatory processes with a wide cross section of stakeholders; and,
- Previous experience working with the Green Climate Fund and other multilateral partner is strongly desired, particularly demonstrable experience in conducting research related to climate change and environmental and social safeguards.

6.2 Specific Areas of Expertise/Experience

In addition, the Consultant must specify the qualifications and relevant experience of each specialist to be assigned to this assessment. Key experts have a crucial role in implementing the contract. These terms of reference contain the required key experts' profiles. The shortlisted consultants shall submit CVs and statements of exclusivity and availability for the following key experts.

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

6.2.1 Key Experts

Team Leader: Environmental Specialist

The Team leader will coordinate the work of the team and have primary responsibility for the deliverables of the assignment. He/she is expected to have the following expertise and qualifications:

- A minimum Graduate Degree in Environmental Science and/or Management and Social Sciences, Natural Resource Management, Environmental Law or related discipline; Ph.D., in any of the fields mentioned would be an asset

- A minimum of five (5) years proven experience in environmental impact assessment process, environmental compliance, environmental policy, environmental and social risk monitoring and management, preferably in the Caribbean Region;
- Knowledge of and experience implementing international social safeguards policies/standards (e.g. GCF, World Bank, GEF, IFC or IADB) would be considered an advantage; and,
- Demonstrated understanding of socio-economic issues and culture in Caribbean island nations would be an asset.

Consultant #2: Engineer: Environmental, Chemical or Civil Engineering

This Specialist should possess the following mix of expertise and qualifications:

- Minimum Master's Degree in Environmental, Chemical or Civil Engineering or other related fields;
- At least 10 years' proven experience identifying, developing and or implementing environmentally friendly technological solution; and,
- At least 5 years' experience managing environmental and social risks associated with water and wastewater systems.

Consultant #3: Stakeholder Specialist

This team member is expected to have the following minimum expertise and qualifications:

- Master's Degree in Social Science, Sociology, Political Science, Anthropology or related discipline or other related social science fields;
- At least ten (10) years' experience conducting stakeholder consultations and social inclusion analysis; and,
- At least three (3) years relevant experience in the Caribbean or a Small Island Developing State is required;

7. LOCATION AND DURATION OF ASSIGNMENT

7.1 Location

The consulting firm's assigned specialists are expected to work from their own office space. If an international or regional consulting firm is selected, the assigned experts will be expected to travel to Barbados to conduct consultations and gather pertinent data.

7.2 Expected Commencement Date and Duration

The intended commencement date October 19, 2020 over 6 months' duration.

8. MANAGEMENT OF THE ASSIGNMENT

The consultancy will be commissioned by the CCCCC. The Consulting Firm will report to CCCCC for contractual and administrative purposes. The CCCCC and BWA will be responsible for the oversight of the deliverables of the TOR. Members of the project core team will provide additional technical advice and inputs, overall coordination and oversight for this study. The Consulting Firm will liaise with relevant stakeholders but will ultimately report to the CCCCC Project Development Specialist assigned to manage this consultancy.

To facilitate the execution of this consultancy, the CCCCC will provide the following:

- a. Available background documents and information relevant to the assignment including:
 - i. 3R-CReWS concept note

- ii. The baseline study and project design resulting from an ongoing consultancy to design the project and conduct a feasibility study¹.
- iii. CCCCC's Environmental and Social Safeguard Policy
- b. Facilitate virtual contact and dialogue with relevant staff and stakeholders of the BWA and the GCF, as necessary, upon the request of the Consultant.

The BWA will also provide access to all relevant background documents and information as well as access to the project sites. This include making available experts for consultation, previous project documents and field visits to the two sewerage treatment plants.

The consultancy will be guided by the following timeframe and payment schedule for each deliverable.

Deliverables	Timeframe	Payment Schedule
1. Inception Report	2 weeks after contract signing	10% upon contract signature and approval of inception report.
2. Baseline Report	5 weeks after contract signing	10% upon submission and approval of Baseline Report
3. Draft Environmental and Social Impact Assessment (ESIA)	10 weeks after contract signing	20% upon submission, presentation and approval of Draft Environmental and Social Impact Assessment (ESIA)
4. Presentation of Draft Environmental and Social Impact Assessment (ESIA)		
5. Final Environmental and Social Impact Assessment (ESIA)	14 weeks after contract signing	20% upon submission, presentation and approval of Final Environmental and Social Impact Assessment (ESIA)
6. Presentation of Final Environmental and Social Impact Assessment (ESIA)		
7. Draft Environmental and Social Management Plan (ESMP)	20 weeks after contract signing	20% upon submission, presentation and approval of Draft Environmental and Social Management Plan (ESMP)
8. Presentation of Draft Environmental and Social Management Plan (ESMP)		

¹ Project baseline study is expected to be completed in November 2020 and draft concept design expected February 2021.

9. Final Environmental and Social Management Plan (ESMP)	24 weeks after contract signing	20% upon submission and approval of the Final Environmental and Social Management Plan (ESMP)
10. Presentation of Final Environmental and Social Management Plan (ESMP)		