**Annex C**

*July 11th 2019*

[Redacted]

This Technical Consultation Document is in connection with the *Administrative Agreement regarding the Establishment of the UK Blue Carbon Fund*, signed on April 2, 2019 as it may be amended from time to time (the “Fund Agreement”).

Below is a description of the “Blue Carbon Restoration in southern Clarendon, Jamaica” Project. Unless we receive a written objection from you by close of business of July 21st 2019, communicated as per the Non-Objection Process set forth in Section 5.1 of the Fund Agreement, we will proceed to allocate $2,450,000 of the Fund to this Project, as per the provisions of Section 5.1 of the Fund Agreement.

**I. BASIC FACTS**

Type of Operation: NON-REIMBURSABLE

Country: Jamaica

Project name: Blue Carbon Restoration in southern Clarendon, Jamaica

Borrower/Beneficiary University of the West Indies’ (UWI) Solutions for Developing Countries (SODECO)

Executing Agency: SODECO

Total project cost: $2,450,000

Total financing cost: $3,368,000

Financing breakdown:

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity/Component** | **IDB/Fund Funding** | **Counterpart Funding**  **(In-kind)** | **Total Funding** |
| Component 1. Site characteristics and impact analysis | $100,000 | $918,000 | $1,018,000 |
| Component 2. Formulation and implementation of restoration actions and measures | $ 1,310,000 | $ 0.00 | $ 1,310,000 |
| Component 3: Implementation of a sustainable charcoal production program | $250,000 | $0.00 | $250,000 |
| Component 4. Monitoring and management of restoration. | $ 375,000 | $ 0.00 | $ 375,000 |
| Component 5. Knowledge Dissemination and training | $ 90,000 | $ 0.00 | $ 90,000 |
| Project Administration | $ 325,000 (13.3%) | $ 0.00 | $ 325,000 |
| **Total** | $2,450,000 (73%) | $918,000 (27%) | $3,368,000 |

**II. PROJECT DESCRIPTION**

2.1 Mangrove ecosystems serve vital ecological and economic functions providing a number of highly valuable ecosystems services including raw materials and food, coastal protection, erosion control, water purification, maintenance of fisheries, carbon sequestration, tourism, recreation, education and research (Barbier et al, 2011). They are considered to be some of the most carbon-dense ecosystems globally (Donato, et al, 2011) and recent estimates of carbon stored (6.4 billion metric tonnes) indicate a greater storage capacity than previously expected (4.19 billion metric tonnes - Sanderman et al, 2018). In spite of their critical attributes, components and services, the loss of mangrove forests globally has been significant with estimates of the reduction in global acreage to be less than 50% of their original total cover because of anthropogenic pressure (Bouillon et al, 2010). The decline in both quality and quantity of these systems continues in spite of local and global efforts to reverse this trend with the main drivers of deforestation/degradation being changes in hydrology, extraction of biota and structural modification through conversion (RAMSAR, 2018).

2.2 The influence of these anthropogenic drivers is expected to be exacerbated with the impacts of climate change. Wilson (2018) suggest that climate change is expected to impact mangroves in Caribbean Small Islands Developing States (SIDS) via a variety of mechanisms, including “sea level rise; increases in atmospheric carbon dioxide; rise in surface temperatures; changes in precipitation; and a predicted increase in the frequency and severity of extreme weather.” It is expected that with an average increase of global temperatures of 1.5 °C there is a moderate risk of loss of these framework species, with the risk remaining the same at 2°C but the level of risk is dependent on what occurs with other human activities affecting the systems (e.g. deforestation, coastal development) (IPCC, 2018).

2.3 Mangrove systems are important natural capital elements of the coastal environment of the Jamaica, occupying approximately 29% of coastline primarily as riverine or fringe systems[[1]](#footnote-1)[[2]](#footnote-2). The vegetation is usually dominated by red mangrove (*Rhizophora mangle*) and mixed areas of black (*Avicennia germinans*) and white (*Laguncularia racemosa*) mangrove tress, with buttonwood (*Conocarpus erectus*) within the transition zones to terrestrial vegetation.[[3]](#footnote-3) In terms of the ecological and economic functions they play in Jamaica, these include acting as (i) major nursery grounds for fish (includes grunt, snapper, snook, tarpon, barracuda and mackerel), crabs, shrimp and other commercial and non-commercial marine life; (ii) providing shoreline protection as they function as natural barriers to wave action; (iii) functioning as natural water filters and sediment traps; (iv) wildlife habitats for more than 200 species of birds and bats, the American crocodile (*Crocodylus acutus*) and West Indian manatee (*Trichechus manatus*); and (v) carbon sinks.[[4]](#footnote-4)

2.3 In spite of these important natural functions and assets of these systems in Jamaica, they have been negatively impacted by human interference, with over 2000 hectares of forested area destroyed or degraded during the period 1989-2010, mainly as a result of agriculture, housing and/or tourism development (NEPA, 2013). In the project area of southern Clarendon, south coast of Jamaica, over 1,600 hectares have been degraded due to prolonged drying from reduction in freshwater inputs as a result of changes in land use for agriculture, aquaculture production; extreme weather events, coastal development, unsustainable livelihood practices and impacts from human settlements. The project area extends from Salt River and Colon Bay in the east, to Maccary Bay and Milk River in the west and around the Portland Cottage area of Southern Clarendon. The population of the communities surrounding the project area is approximately 30,000 people. The primary economic activities in the area are fishing and agriculture but there is also charcoal production (for use in commercial food production) within the area using wood from fast growing Acacia trees that have invaded abandoned agricultural land or are in dry forests, but mangrove wood is also harvested for production. The mangroves in the project area are publicly owned and are under the management of the Sugar Company of Jamaica Holdings Ltd (SCJH), a wholly owned Government of Jamaica land management company. Although there are no direct estimates of the ecological value of the mangrove systems in the project area, a section of its eastern side is located within a key biodiversity area in the country - the Portland Bight Protected Area (PBPA) and estimates of the biodiversity benefits of the PBPA in present value terms are US$18.3 million calculated over a 25 year period and a 10% discount rate. Additionally, fisheries benefits were valued at US$19 million, carbon sequestration at US$4.0 million and a total ecosystem services benefits value of US$52.6 million (Cesar et al, 2000).

2.3 The objective of the project is to restore mangrove ecosystems in southern Clarendon along the south coast of Jamaica, to conditions of viable/healthy and optimally functioning coastal forested ecosystems. The interventions are expected to improve the sequestration capacity of these restored areas to store blue carbon (carbon that is stored in coastal and marine ecosystems), in addition to improving climate change resilience.

**Description of Activities and Outputs**

2.3 **Component I:** **Site characteristics and impact analysis**. The main objective of this component is to undertake an assessment of site characteristics and impact analysis of the proposed restoration areas. The primary activities of Component 1 are: (i) historical analysis and mapping of the mangrove areas on the south coast of Jamaica and identification of their hydrological, geomorphological and biological attributes and relevant socio-economic characteristics. The analysis will compass mangrove areas in the Parish of Clarendon, from Salt River and Colon bay in the east to Maccary Bay and Milk River in the west and around the Portland Cottage area. Topographic surveys will be undertaken within the project area using both aerial survey and ground survey methodology in order to generate base maps with 1 meter contour intervals; (ii) identification and analysis of the contributory events/factors resulting in the changes to the coverage and health of the mangrove areas. The output of this activities will be an assessment of the changes over time of the mangrove areas and contributory causes of these changes.

2.4 **Component II:** **Formulation and implementation of actions and measures to restore 1,600 ha of mangroves.** The main objective of this component is to formulate and implement rehabilitation activities to reverse the degradation trends within the mangrove areas. The primary activities of component 2 are: (i) stakeholder engagement on creation of solutions for restoration and validation of the plans and actions for restoration. The stakeholder engagement will include a stakeholder mapping of the direct and indirect users of the goods and services of the mangrove systems. Some key stakeholders within the area include both public and private actors – local sugar company (SCJH), public water provider, bauxite company, charcoal producers, farming and fishing communities who will be key in providing support for the restoration efforts such as the provision of water, engineering equipment and services, leases of land (especially in adjacent transitional zones) and survey data, reducing deforestation, etc. Engagement with some of these stakeholders has already begun to the extent that leases over land have been acquired from the SCJH for a period of 50 years renewable under a peppercorn lease, for JA$1000.00 per annum; (ii) Formulation and implementation of restoration plans and actions for degraded areas that will involve (a) hydrological analyses of the system to determine historical and current patterns and alterations to water flow; (b) baseline analysis of aboveground (biomass) and belowground (biomass and soil) blue carbon stocks; (c) social and environmental impact assessments in accordance with local regulations and practices. SODECO as the execution agency will be responsible for the competitive procurement and management of the necessary services required for accomplishing the activities. It is envisioned that the restoration area would be available to UWI students and researchers to be used as a living laboratory on various aspects of wetland restoration as a function of SODECO’s management of the program. The main output of this component will be the restoration of 1,600 ha of mangroves.

2.3 **Component III; Implementation of a sustainable charcoal production program.** The objective of this component is to design and implement a program for the sustainable production of charcoal used in the restaurant and hotel industry for grilling, in order to remove the stressor of deforestation on the mangrove system. Charcoal production in the project area typically utilizes wood harvested from Acacia trees growing on abandoned agricultural land but also from the harvesting of mangroves trees. Production is done using crude earthen kilns that are characterized by high levels of particulate air pollution which is generated during the pyrolysis process. It is estimated that about 1000 charcoal producers operate within the region and supported by an unknown number of distributors and retailers within the value chain. The primary activities of this component are: (i) analyze the characteristics of the charcoal industry in the project area including principal areas of production and primary actors (i.e. producers, distributors and retailers); (ii) Identify areas for growth of Acacia forests for sustainable harvesting and production of wood for charcoal production; (iii) undertake stakeholder/community engagement to obtain buy-in of the sustainable interventions to sustainably manage the production of charcoal; and (iv) develop and implement a Sustainable Charcoal Production Plan including the use of improved pyrolysis plants, designated area of managed Acacia forests and the digital tracking of harvested wood for charcoal production. The main output of this component will be the development and implementation of the Sustainable Charcoal Production Plan.

2.3 **Component IV:** **Management and monitoring of restoration program.** The main objective of this component is to manage and monitor the activities, to make adjustments when required to ensure the successful implementation and sustainability of the restoration program and assess the improvement in economic value of the restored system. The primary activities of component 3 are: (i) development and implementation of a management plan including a monitoring and evaluation (M&E) plan for the restoration program in ensure that activities are implemented according to design and sustained. There have been some instances where restoration efforts have failed because of the absence of active management of program as regular maintenance is required (e.g. removal of garbage, debris etc. that may inhibit mangrove growth or controlling the intrusion of animals such as goats or cows into restored areas). Also, mid-course adjustments may be required if restoration goals are not being achieved. It is expected that the monitoring and evaluation plan will involve the use of innovative technologies and approaches such as the use of drones or automated water flow sensors given the difficulty of movement within these systems, so as to reduce the work effort needed for this task; (ii) Analysis of the improvement in economic value of the mangroves based on restoration activities. As the outputs of the restoration efforts are realized, there is a need to determine the improvement in the economic value of the rehabilitated areas in order to provide support and strengthen efforts for mangrove reforestation and conservation in other parts of the region. UWI researchers will lead the effort on the management and monitoring of the restoration efforts and of course it will be supported by students, particularly as it is envisioned that the area will be incorporated into their research studies; having access to this ”living laboratory” will be an excellent marketing tool to attract students to the restoration field of study. The output of this component will be the development and implementation of a management plan and M&E plan and an economic valuation of the restoration action.

2.4 **Component V.** **Knowledge dissemination and training.** The objective of this component is to create a knowledge platform for the dissemination of results and to facilitate local training from the activities of the program. The main activities of Component 4 are: (i) to undertake a series of workshops / seminars / conferences to showcase the results of the project to key targeted audiences including local communities, policy makers, private sector and academia; (ii) development of technical and researcher papers for peer-reviewed publications. It is anticipated that the program will help researchers and graduate students to undertake wetland restoration research, particularly as a field station is being refurbished in the project area that will be available to researchers; (iii) develop and implement a training program on wetland restoration and ecosystem services for local communities. A target is set of approximately 75 persons to be trained over the lifetime of the project in mangrove rehabilitation methods and monitoring and conducting eco-tourism tours of the area, with at least 50% being women and vulnerable youth. Community involvement in restoration efforts is critical to the success of these programs and the associated livelihoods activities encourages involvement and ownership by communities. The main output is a knowledge and training platform for the dissemination of results and the training program.

**Execution period: 72 months**

**Expected Results Framework indicators and, when available, preliminary expected results:**

4.1 *Component I: Site characteristics and impact analysis.*

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| --- | --- |
| **Indicator** | **Target** |
| ICF KPI 14: Level of institutional knowledge of Blue Carbon issues in partner countries | TBD |
| Mangrove cover maps and historical analysis completed. | Number of organizations using cover maps |
| Impact analysis completed | At least three IAs |

*Component II: Formulation and implementation of restoration actions and measures*

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| --- | --- |
| **Indicator** | **Target** |
| ICF KPI 8: Number of hectares where deforestation and degradation have been avoided or restoration has occurred through ICF support | 1,600 ha of mangrove habitat |
| ICF KPI 6: GHG avoided and reduced | 80,000 tons of CO2 per year |
| Private sector participation in mangrove stakeholder engagement | At least four entities collaborating on the project (includes sugar and bauxite companies) Approximately JMD$16 million (~US$ 117,000) has been contributed to date |
| Public sector participation in mangrove stakeholder engagement | At least two government agencies collaborating on the project (includes Forestry Department and National Water Authority and National Works Agency) |
| NGO/CBO participation in mangrove stakeholder engagement | TBD |
| ICF KPI 12: Amount of private resources mobilized | US$918,000 counterpart to date |

*Component III: Management and monitoring of restoration program*

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| --- | --- |
| **Indicator** | **Target** |
| ICF KPI 3: Number of forest dependent people with livelihoods benefits protected or improved as a result of ICF support | TBD |
| Number of management plans developed | 1 Sustainable Charcoal Production Plan |

*Component IV: Management and monitoring of restoration program*

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| --- | --- |
| **Indicator** | **Target** |
| ICF KPI 14: Level of institutional knowledge of Blue Carbon issues | TBD |
| Number of management plans developed | 1 mangrove restoration management plan |
| Number of M&E plans developed | 1 M&E plan |
| Number of economic valuation analyses undertaken | At least 1 analysis of the improvement of economic value of mangrove from restoration activities |
| ICF KPI 10: Value of ecosystem services protected through ICF support | TBD |

*Component V: Knowledge dissemination and training.*

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| --- | --- |
| **Indicator** | **Target** |
| ICF KPI 14: Level of institutional knowledge of Blue Carbon issues in partner countries | TBD |
| Number of knowledge products produced related to mangrove restoration. | 4 technical / research papers produced |
| Number of people in surrounding communities trained in mangrove restoration and ecosystem services | At least 75 persons trained with at least 50% being women and vulnerable youth |
| Number of knowledge platforms developed | 1 Knowledge platform |

**III. PROJECT AGENCIES**

3.1 The project will be executed by University of the West Indies’ (UWI) Solutions for Developing Countries (SODECO), Mona, Jamaica. UWI SODECO is a research organization established by The University of the West Indies, which is mandated to provide opportunities to improve human health, wealth and wellbeing in developing countries. SODECO manages grants from a various international and local organizations in the implementation of its programming including a grant from the Environmental Foundation of Jamaica on mangrove conservation and restoration in Jamaica and a grant from the Global Challenges Research Fund on “Transforming Land Use for Sustainable Livelihood Development and Climate Resilience.” SODECO will be collaborating with UWI’s Centre for Marine Sciences and the Climate Change Studies Group as part of the technical support for the implementation of the program. UWI SODECO will hire individual consultants and/or firms in accordance with the Bank's procurement policies and procedures for the implementation of activities under the project. An evaluation of the institutional capacity of SODECO was performed during the week of July 1st 2019 using the IDB’s Institutional Capacity Assessment Platform (ICAP) tool[[5]](#footnote-5) and included a review of the relevant documentation - its Financial Code and the Procurement Procedures Manual in order to corroborate the findings of the assessment. The evaluation indicated that the program has a medium-low fiduciary risk, and as such, it is believed that SODECO, (i) based on the current structures and fiduciary systems in place, and (ii) once it has the project management unit established, will have the capacity to execute the operation. It was also recommended that training for familiarity with Bank’s policies and procedures should be provided to SODECO once the operation is approved. The project management unit will be established to help manage the program, together with a technical advisory committee (TAC) which will provide technical oversight of the program. The project management team will consist primarily of a finance and accounting specialist, a procurement officer, a wetlands ecologist (part-time) and project evaluation officer (part-time). These positions are necessary in order to manage the necessary inputs of the project and respond to the various fiduciary requirements of Bank financed operations.

3.2 The project will leverage and complement IDB Group activities in Jamaica, including IDB Proadapt program which pilots and supports the development of new and innovative methodologies, tools, and business models to help MSMEs in Latin America and the Caribbean increase their climate resilience. Proadapt will examine ways to improve livelihoods amongst charcoal producers, fishermen and other groups in and around the mangrove areas.

**IV. STRATEGIC ALIGNMENT**

4.1 Alignment with UK Blue Carbon eligibility criteria and Fund thesis:

4.2 The project is aligned with existing IDB program on Sustainable Islands Platform, which seeks to help island territories pursue sustainability under the pillars of Blue and Circular economy and climate change resilience. This project will add to the understanding and strengthen the carbon sequestration component of the Blue economy of islands. In addition, the project is aligned with the IDB’s Natural Capital Lab programming, which seeks to develop projects that value the range of ecosystem services of a country’s natural assets.

4.3 Theory of Change: The mangrove system in the Salt River/Colon Bay – Portland Cottage - Maccary Bay area of southern Clarendon has been negatively impacted by both anthropogenic (i.e. road construction, shrimp farming, agricultural development, charcoal burning) and natural events (i.e. hurricanes, coastal erosion), which have reduced their ecosystems services and functions. If the project utilizing resources from the Defra Blue Carbon Fund, can implement restoration measures such as the removal of constructed barriers, increase of water flow into affected areas or active replanting of mangroves and removal of the current stressor of deforestation (charcoal production), then the expected impact will be the reforestation of degraded areas and reduction in GHG emissions through the improved sequestration of CO2. The main assumption to the program is that the information generated from the various studies i.e. the mapping, impact analysis, the hydrological, biological and topographical studies, will be sufficient and appropriate to guide and inform the proposed restoration interventions.

**V. IDENTIFICATION OF POTENTIAL RISKS**

5.1 The main risk anticipated for the project is that the mangrove rehabilitation efforts will be negatively impacted by human interference. To mitigate this risk, the program will actively involve community participation particularly through the training program so that local communities will take ownership of its objective and benefits.

5.2 Another potential risk to the program is the delay in implementation as a result of difficulties associated with the permitting and regulations process of the local environmental regulatory agency. To negate this risk, the program management unit will engage in local authorities at the start of the project to ensure alignment with national strategies and policies. UWI SODECO has already engaged the National Environment and Planning Agency (NEPA), and has secured partnership with this regulatory agency on the implementation of the restoration project. NEPA has identified the shared goals and strategies that the UWI SODCEO mangrove restoration activities represent and have in response proposed the signing of an MOU to promote the close collaboration of UWI SODCEO and NEPA towards achieving the shared goals of this project. The MOU will be signed in August 2019.

5.3 Another potential risk to be considered should be natural disasters i.e. hurricanes, as the South Coast of Jamaica is more prone to be affected by hurricanes based on its geographical location and the historical pattern/trajectory of hurricanes. Even without making land fall, the increase and change in wave energy and the alteration of erosional and depositional regimes can have adverse effects on coastal ecosystems; one of which can be the accumulation of sand which can negatively affect tidal flows. This project will produce in depth understanding of the mechanisms of destruction of mangroves deriving from hurricane impact in Jamaica and also trial rehabilitative strategies. It is expected that the information will guide mitigation and build back better approaches to mangrove maintenance.

**VI. Environmental and Social Classification**

6.1 The team will classify the project under ESG once UK pre-screening is completed.

For an operation with reimbursable and non-reimbursable components, one TCD will be submitted including the applicable elements above.

Sincerely,

[Redacted]

1. NEPA, 2011. The State of the Environment Report 2010, Jamaica. National Environmental Protection Agency. [↑](#footnote-ref-1)
2. NEPA, 2015. The State of the Environment Report 2013, Jamaica. National Environmental Protection Agency. [↑](#footnote-ref-2)
3. Cesar et al, 2000. Economic valuation of an integrated terrestrial and marine protected area: Jamaica’s Portland Bight. Collected Essays on the Economics of Coral Reefs. Editor: Herman S.J. Cesar. [↑](#footnote-ref-3)
4. NEPA, 2015. The State of the Environment 2013 Jamaica. [↑](#footnote-ref-4)
5. ICAP) is a tool that helps obtain information about the capacity of an institution to execute a program financed by the IDB. The ICAP is made of 6 thematic modules (Legal, Framework; Human Resources & Capabilities; Administration of Projects; Procurement Management; Financial Management; Environmental & Social Management Safeguards) each of which contains several questions grouped into executability conditions. These conditions are assumptions that normally contribute to a successful execution of an IDB project. [↑](#footnote-ref-5)