GEF-8 PROJECT IDENTIFICATION FORM (PIF)

TABLE OF CONTENTS

General Project Information

Project Title	
Barbados - Accelerating transition to climate-resilient agrifood systems (BATCRAS)	
Region	GEF Project ID
Barbados	11270
Country(ies)	Type of Project
Barbados	FSP
GEF Agency(ies):	GEF Agency ID
FAO	746785
Executing Partner	Executing Partner Type
MINISTRY OF AGRICULTURE AND FOOD AND NUTRITIONAL SECURITY (MAFS) - Barbados	Government
GEF Focal Area (s)	Submission Date
Climate Change	4/13/2023
Project Sector (CCM Only)	
Renewable Energy	
Taxonomy	
Climate Change, Focal Areas, Strengthen institutional capacity and decision-making, Influencing models, Civil Society, Stakeholders, Gender Mainstreaming, Gender Equality, Capacity, Knowledge and Research	
Type of Trust Fund	Project Duration (Months)
MTF	60
GEF Project Grant: (a)	GEF Project Non-Grant: (b)
3,502,968.00	0.00
Agency Fee(s) Grant: (c)	Agency Fee(s) Non-Grant (d)
332,781.00	0.00
Total GEF Financing: (a+b+c+d)	Total Co-financing
3,835,749.00	19,950,000.00
PPG Amount: (e)	PPG Agency Fee(s): (f)
150,000.00	14,250.00
PPG total amount: (e+f)	Total GEF Resources: (a+b+c+d+e+f)
164,250.00	3,999,999.00
Project Tags	

CBIT: No NGI: No SGP: No Innovation: No

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. The explanation and justification of the project should be in section B "project description".(max. 250 words, approximately 1/2 page)

Barbados is a Small Island Development State (SIDS) facing the typical SIDS challenges, including remote geography, narrow resource base, high import and export costs, limited economic diversity as well as irregular international traffic volumes, and elevated hurricane risks. It is highly vulnerable to climate change, which will affect the agricultural sector, in particular given the scarcity of water and agricultural land. Indeed, Barbados has one of the highest population densities in the world and is also one of the most water scarce countries in the world. Climate change is expected to exacerbate such scarcities because droughts are expected to become more frequent with increased soil erosion.

To accelerate the transition to climate-resilient and low-emission gender-sensitive agrifood systems and strengthen the adaptive capacity of farmers in Barbados, the project will support climate-resilient and low-emission, gender-sensitive food production, including increasing the climate-responsiveness of decision-making. To achieve this, the project will (i) increase availability and use of agrometeorological data in decision making, (ii) provide hands-on gender-sensitive training programmes, including demonstrations of climate-resilient and low-emission practices and technologies that increase water and land productivity, such as rainwater harvesting, greenhouse farming, solar powered irrigation, hydroponics and aquaponics; (iii) strengthen organizational capacity of farmer associations to drive climate resilience; and (iv) establish a framework for upscaling of climate-resilient and low-emission gender-sensitive technologies for food production through local businesses, commercial banks and other private sector entities.

The project will be implemented by FAO that has developed important experience in climate-resilient practices and technologies and completed pilots in Barbados. It will be executed by the Ministry of Agriculture, Food and Nutritional Security (MAFS) in collaboration with other local organizations. It will be implemented over a period of five years and will be nation-wide in scope with a particular emphasis on the main agricultural parishes illustrated in Annex C (of the Agency project document).

Indicative Project Overview

Project Objective

To accelerate the transition to climate-resilient and low-emission gender-sensitive agrifood systems and strengthen the adaptive capacity of farmers in Barbados

Project Components

1. Climate-responsive, gender-sensitive decision-making for resilient agrifood systems

Component Type	Trust Fund
Technical Assistance	SCCF-A
GEF Project Financing ($)	Co-financing ($)
860,658.00	5,000,000.00

Outcome:

1.1 Improved decision-making for gender-sensitive climate change adaptation and resilience action at national and farm levels

Indicator:

- Number of agricultural stakeholders (disaggregated by sex) using agrometeorological data in decision-making

Output:

1.1.1 Increased availability of agrometeorological data and enhanced capacity to interpret and use data at farm and national levels

1.1.2 Gender-sensitive climate advisory products and services developed for farmers

2. Climate-resilient, gender-sensitive food production

Component Type	Trust Fund
Technical Assistance	SCCF-A
GEF Project Financing ($)	Co-financing ($)
1,515,025.00	8,537,502.00

Outcome:

2.1 Increased food production using climate-resilient, gender-sensitive practices and technologies

Indicators:

- Area of agricultural land managed for climate resilience (ha)

- Number of farmers (disaggregated by sex) producing with adaptation technologies (protected agriculture, soilless cultivation, aquaculture, aquaponics

2.2 Increased private sector engagement in climate-resilient, gender-sensitive food production

Indicator:

Number of private sector enterprises engaged in gender-sensitive climate change adaptation and resilience action in the local agrifood system

Output:

2.1.1 Demonstration sites established, and hands-on training programme implemented to strengthen farmers' and extensionists' knowledge and skills to implement climate-resilient, gender-sensitive practices and technologies

2.1.2 Demonstration sites established, and hands-on gender-sensitive training programme implemented to foster the expansion of resilient aquaculture and aquaponics.

2.2.1 Strengthened organizational capacity, business acumen and peer-to-peer learning within and among established and nascent farmer associations to drive climate resilience and gender equality in the local agrifood system

2.2.2 Framework established for upscaling of climate-resilient, gender-sensitive technologies for food production through local businesses, commercial banks and other private sector entities

3. Low-emission, gender-sensitive food production

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
791,894.00	4,462,498.00

Outcome:

3.1 Increased food production using low-emission, gender-sensitive practices and renewable energy technologies

- *Amount of greenhouse gas emissions mitigated (metric tons of CO_2 equivalent)*

- *Number of farmers (disaggregated by sex) applying low-emission agricultural practices and/or producing with renewable energy technologies*

Output:

3.1.1 Demonstration sites established, and hands-on, gender-sensitive training programme implemented to strengthen farmers' and extensionists' knowledge and skills to implement low-emission practices and renewable energy technologies

M&E

Component Type	Trust Fund
Technical Assistance	SCCF-A
GEF Project Financing ($)	Co-financing ($)
126,437.00	750,000.00

Outcome:

Project implemented according to results-based management principles

Output:

i. Gender-sensitive project M&E system designed and operational

ii. Project evaluations completed on time to support project delivery and knowledge sharing

iii. Monitoring
reports submitted to the Implementing Agency and GEF Secretariat on time

iv. Gender-sensitive communications strategy developed and implemented

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
42,146.00	250,000.00

Outcome:

Project implemented according to results-based management principles

Output:

i. Gender-sensitive project M&E system designed and operational

ii. Project evaluations completed on time to support project delivery and knowledge sharing

iii. Monitoring reports submitted to the Implementing Agency and GEF Secretariat on time

iv. Gender-sensitive communications strategy developed and implemented

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
1. Climate-responsive, gender-sensitive decision-making for resilient agrifood systems	860,658.00	5,000,000.00
2. Climate-resilient, gender-sensitive food production	1,515,025.00	8,537,502.00
3. Low-emission, gender-sensitive food production	791,894.00	4,462,498.00
M&E	126,437.00	750,000.00
M&E	42,146.00	250,000.00
Subtotal	**3,336,160.00**	**19,000,000.00**

Project Management Cost	41,702.00	237,500.00
Project Management Cost	125,106.00	712,500.00
Total Project Cost ($)	**3,502,968.00**	**19,950,000.00**

Please provide justification

PMC is equal to 5% exactly per Trust Fund

PROJECT OUTLINE

A. PROJECT RATIONALE

Briefly describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

Barbados is a Small Island Development State (SIDS) in the Caribbean, and the most easterly of the Caribbean islands that occupies an area of 432 km^2 and has a population of about 281,200 (2021). The population density (668/km^2) is one of the highest in the world. Barbados faces the typical SIDS challenges including remote geography, narrow resource base, high import and export costs, limited economic diversity, as well as irregular international traffic volumes, elevated hurricane risk, and also risks of volcanic eruptions[1][1]. Since the economy is highly dependent on tourism and food imports, the COVID-19 pandemic as well as the Ukraine war significantly increased volatility.

Barbados' agriculture sector is adversely affected by climate change. Mean annual temperature has increased by 0.74°C between 1901 and 2021[2][2] and is expected to rise further, independently of the model, methodology or scenario employed. Although the increase in temperature is projected to be smaller compared to the global average, the impact is likely to still be significant due to the lower temperature variability in the Caribbean[3][3]. Historical rainfall trends show significant decadal and interannual variability, but the number of consecutive dry days and the amount of heavy rainfall events have increased[4][4]. Projections show a slight increase (2%) in annual precipitation with 1.5°C warming, inducing increases in the wet season (June to November) and decreases in the dry season (December to May). Since 2010, hurricanes Tomas (2010), Ernesto (2012), Harvey (2017), and Elsa (2021) and tropical storms Matthew, Maria, Kirk and Gonzalo (2020) have impacted the island and have incurred serious damage, including flooding and waterlogged farmlands due to torrential rainfall. These climate hazards have been proven to damage seedlings, reduce plant growth and favour the proliferation of pests and diseases. In the past, heavy rainfall has also caused landslides in the Scotland District[5][5]. Several studies conclude that the proportion of intense tropical cyclones is expected to increase under a 2°C warming scenario. Due to Barbados' location along the Atlantic hurricane belt, it is susceptible to all major hazards, with storm surges and high-speed winds risking destroying agricultural infrastructure, causing soil losses, and damaging crops and livestock. The mean sea level in the Caribbean region has risen by around 1.8 ± 0.1 mm per year between 1950 and 2020 and sea level rise (SLR) is projected to reach or exceed 1 m by the 2100s, relative to the 1980-1999 baseline[6][6]. SLR of 1-2 m is projected to impact around 1% of the available agricultural land through coastal inundation and soil salinization, and to affect groundwater aquifers through saline intrusion. Based on modelling results, a high-

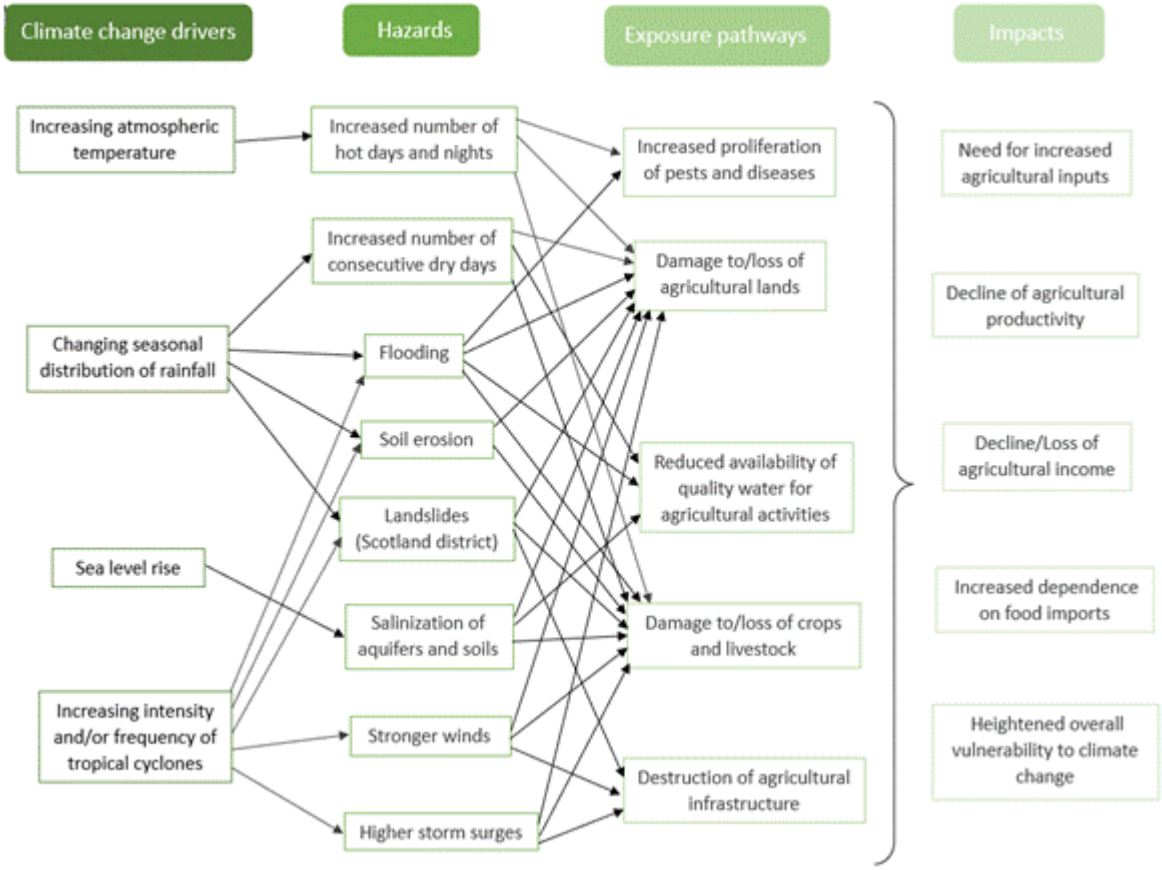
range SLR scenario would incur annual and capital agricultural losses of USD 1 million by 2050 and USD 2 million by 2080[7][7].

Cropland is scarce, and climate change will exacerbate such scarcity. The area under cultivation declined by 53% during the last 30 years. Most of the lost cropland was covered by sugarcane, whose area reduced by 79% during the same period. Yet the remaining area under cultivation still reduced by around 11%, while the total population increased by 9% during the same period. Cropland was therefore converted to other uses, such as residential and commercial. Most of the remaining area is farmed by small producers. The majority of soils are shallow and acidic, with reduced organic carbon content and low water retention capacity. Extreme weather events and the rising sea water caused by climate change are expected to increase soil erosion and cause salinization.

Barbados is highly water stressed. The island strongly relies on groundwater resources, but only an estimated 20% of the mean annual rainfall percolates the coral rock to replenish the groundwater aquifers[8][8]. Without significant surface water bodies and increased construction of impermeable surfaces, a considerable amount is lost as runoff, particularly in the Scotland District. With 279.09 m^3 of renewable water resources per capita per year[9][9], Barbados is experiencing "absolute water scarcity[10][10]" and ranks amongst the most water scarce countries in the world. Freshwater withdrawal represents 87.5% of available freshwater resources[11][11]. The increasingly skewed pattern of precipitation and increasing evapotranspiration due to higher temperatures will set the stage for increased drought, which will further decrease underground recharge rates and increase salinization of aquifers. During the Caribbean drought of 2009-2010, water levels in aquifers were extremely low and water was rationed for farmers, reducing agricultural productivity[12][12].

Land and water scarcity, coupled with climate change impacts, are causing food insecurity. Food insecurity is high for a country with a per capita GDP of USD 17,225.5 (2021): the percentage of people who live in households classified as moderately or severely food insecure was estimated at 31.1% in 2020 (World Development Indicators). Even if no data are available after 2020, the high food inflation – reaching an all-time high of 20.1% in April 2022[13][13] – is expected to further increase food insecurity. This is in parallel to lack of diversity in diet and increasing rates of obesity, resulting in an increased incidence of non-communicable diseases (NCDs). With limited agricultural production, Barbados is a net importer of food. In 2022, the food and beverage import bill stood at USD 408.5 million; imported food accounts for more than half of the total food consumed[14][14]. Climate change is expected to exacerbate food insecurity.

Figure 1. Climate change impact chain



Agriculture, energy and GHG emissions. Currently, over 90% of the energy used for electricity production in Barbados is derived from imported carbon-based fuels. As rainfed farming is increasingly less of an option due to climate change, farmers strongly rely on energy for pumping of water. Consequently, they are burdened with high energy costs, which limit the competitiveness of local agricultural products. This is part of the structural problems contributing to the high food import bill. Barbados has launched many successful sustainable energy programmes, but the start-up costs are relatively high and often out of reach of vulnerable persons, including small, young and women farmers[15]. Although Barbados' contribution to global GHG emissions is minor, the agriculture sector is comparatively GHG intensive. Due to the lack of technical capacity and limited availability of clean technologies, low-emission farming practices and renewable energy systems have not yet been widely adopted. Integrated strategies for climate change adaptation and mitigation bear an untapped potential on the island, especially with the use of renewable energy technologies as an adaptation solution for the country to decrease its dependency on imported fossil fuels.

Barriers to effective climate change adaptation in the agriculture sector. Barbadian farmers are vulnerable to the described climate change hazards and impacts because they lack the knowledge and skills to adopt climate-resilient practices and technologies. Soil, water and nutrient management practices are often inadequate or inefficient. Diversification in production is limited and access to finance low. Additionally, collaboration among farmers and joint marketing of produce is minimal. Besides the St. George Farmers Marketing Cooperative Society, there are few active, resource-oriented farmer associations.

Government Strategy. The Government developed the 2022 Bridgetown Initiative to recover from COVID-19 and address the climate crisis. Such a strategy seeks to obtain emergency liquidity, attract grant financing for de-risking investments and activate the private sector. Energy, transport and agriculture are three priority sectors. However, details on how to achieve such objectives for the agriculture and food sector are scarce. The Bridgetown Initiative builds on the Roofs to Reefs Programme (R2RP),[16] a holistic, integrated national initiative for the resilient development of Barbados.

Agricultural strategy. The Ministry of Agriculture and Food and Nutritional Security (MAFS) of Barbados developed an Agriculture and Climate Change Policy for the period 2022–2035. Such policy has the objective to transform the agriculture sector in Barbados with particular attention to the effective use of resources, as well as the adoption of appropriate technology and sound management practices, including irrigation. The overarching goal is to contribute to social and economic development and food security, as well as to the sustainable management of the natural resource base. Agriculture also has the potential to generate employment. However, the Ministry lacks sufficient financial resources and capacity to achieve such objective, particularly in terms of climate change adaptation.

Barbados is a strong contributor to the international dialogue on SIDS. For instance, Barbados supports the SAMOA Pathway, even if more concrete actions are needed. Barbados participates in the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), the Cartagena Protocol on Biosafety (CPB), the Convention on International Trade in Endangered Species of wild Fauna and Flora (CITES), the Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region (SPAW), the Ramsar Convention on Wetlands, the Convention to Combat Desertification and Drought (UNCCD), among others.

Weather and climate information services (WCIS) are recognized as a powerful tool to support the management of climate risk in the context of climate variability. The first step to increase climate resilience of the agrifood systems and to strengthen the adaptive capacity of small farmers is to increase the use of weather and climate information to guide farmers' decision making. Farmers who base their decision on actualized weather and climate information can increase productivity by improving their decision of which crop and variety to grow, choosing the schedule of crop operations such as land preparation, sowing, fertilizing, weeding, etc., and selecting suitable crop practices.

Meteorological data for agriculture requires the use of additional sensors and tools compared to standard weather data. While there are numerous weather stations on the island, only a few of them generate the in-depth data needed for agriculture, and specifically crop production. For instance, evapotranspiration data is essential for decisions related to irrigation and to estimate the risk of agricultural pests and diseases. In addition, dissemination of agrometeorological information in a format that is suitable for farmers' skills is key to strengthen agricultural resilience. At the moment, data is available mostly through the webpage of the Meteorological Services (https://www.barbadosweather.org) but most small farmers do not have the capacity to use such webpage or lack the capacity to interpret the data provided. Since most farmers have access to cellular phones, a targeted SMS-based information system would be more appropriate to reach them.

Climate resilient and resource efficient technologies and practices. The Agriculture and Climate Change Policy identifies a list of climate-resilient and resource efficient technologies and practices that have significant potential in Barbados. Examples of technologies and practices that can increase land and water productivity are: (i) heat and salt resistant crop varieties; (ii) Integrated Pest Management programs; (iii) soil

protection approaches such as organic mulching, reduced soil disturbances, and crop rotations; (iv) an integration of water harvesting, storage, and solar powered irrigation; (iv) hydroponics and aquaponics; (v) greenhouse farming, etc. These technologies and practices have the potential to increase water and soil efficiency (i.e., the amount of food produced per unit of water and/or land) while increasing diversification – a key approach to reduce risks.

The potential of farmers' associations. Barbados has several commodity-based farmer associations, which are coordinated under the Barbados Agricultural Society (BAS) umbrella organization. While the Barbados Egg and Poultry Producers Association and the Barbados Pig Farmers Co-operative Society are well-established and quite active, nascent groups, in particular in the fruits and vegetables and tree crop subsectors, require organizational strengthening. Issues pertaining to governance, coordination, marketing, and resource mobilization currently block their proper functioning and undermine their potential to capitalize on co-production capacities, achieve economies of scale, increase revenues and share benefits among members. Climate-responsive organizational strengthening and business development programmes, including peer-to-peer knowledge exchange among stronger and weaker commodity groups, represent an important opportunity for these associations to assume a more prominent role in the transformation of the local agrifood system.

Stakeholders. The following organizations have participated in the project development process or have been identified as key stakeholders based on the consultation results:

- Ministry of Agriculture, Food and Nutritional Security (MAFS). Government entity responsible for project execution.
- Barbados Agricultural Development and Marketing Corporation (BADMC). Statutory agency under the MAFS with the objective of developing non-sugar agriculture in Barbados. BADMC will be intimately involved in the project given its day-to-day interactions with farmers.
- Barbados Agricultural Management Company (BAMC). Statutory agency under the MAFS facilitating the establishment and expansion of small and medium-sized agricultural enterprises. BAMC will be a key partner as it relates to climate-responsive agri-business development.
- Barbados Meteorological Services (BMS). Government entity within the Ministry of Home Affairs and Information. It will be a key partner in aspects related to agrometeorological data, tools and technologies.
- Barbados Agricultural Society (BAS), including its member commodity groups (e.g., Barbados Apiculture Association, Barbados Dairy and Beef Producers Association, Barbados Egg and Poultry Producers Association, Barbados Association of Pig Farmers, Barbados Rabbit Farmers Association, Barbados Sheep and Goat Farmers Association, Fruit and Vegetable Growers). The BAS is the secretariat for nine commodity groups representing over 500 male and female farmers.
- The Barbados Bankers Association (TBBA). It will support innovative financing mechanisms under Component 2.
- Barbados Agricultural Credit Trust. Statutory agency under the MAFS. It will be engaged as part of the work with local financial institutions.
- Ministry of Environment, National Beautification, Green and Blue Economy. Government entity responsible for the dialogue with the GEF.

- Ministry of Energy Business. It will support project activities involving renewable energy technologies.

- Samuel Jackman Prescod Institute of Technology (SJPI). Technical and vocational education and training (TVET) institution offering agricultural programmes. It plays an important role in attracting Barbados' youth to climate-resilient agriculture.

- Barbados Community College (BCC). Offers an Associate Degree Programme in Agriculture that provides the impetus for further study in the field or entry into farming. Also offers an Associate Degree in Environmental Science with courses tailored to climate-responsiveness, including sustainable agricultural methods. Important stakeholder when it comes to attracting Barbados' youth to climate-resilient agriculture.

- Barbados Water Authority (BWA). Statutory body responsible for supplying Barbados with potable water. It will be a key stakeholder in activities involving rainwater harvesting and efficient irrigation.

- University of the West Indies (UWI). In particular: Faculty of Food and Agriculture (FFA) and Centre for Resource Management and Environmental Studies (CERMES). UWI led the desktop study and consultative process for the development of this project concept.

- Caribbean Agricultural Research and Development Institute (CARDI). Regional research institute established by the Caribbean Community (CARICOM) with a country office in Barbados. CARDI's research will inform Farmer Field School programmes.

- Biocultural Education and Research Programme (BERP). Non-profit organization that promotes the conservation of plant biodiversity and traditional knowledge in Barbados through education and research. Relevant actor in relation to research on agriculturally important climate-resilient plant species.

- Caribbean Institute for Meteorology and Hydrology (CIMH). It will be a key partner under Component 1.

- Caribbean Network of Rural Women Producers (CANROP). It will help to design and implement gender-responsive activities.

- Barbados Association of Non-Governmental Organizations (BANGO). It will help engage non-governmental and civil society stakeholders in project design and implementation.

- Barbados Small Business Association. It will help convey the perspective of small agribusinesses and will be an important player when it comes to establishing partnerships with and raising co-financing from the private sector.

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[1] Even if Barbados is not a volcanic island, in 2021 it suffered from the eruption of La Soufrière in neighboring Saint Vincent.

[2] World Bank. 2021. Climate change knowledge portal for development practitioners and policy makers.

[3] Taylor, Michael A., Leonardo A. Clarke, Abel Centella, Arnoldo Bezanilla, Tannecia S. Stephenson, Jhordanne J. Jones, Jayaka D. Campbell, Alejandro Vichot, and J. Charlery. 2018. 'Future Caribbean Climates in a World of Rising Temperatures: The 1.5 vs 2.0 Dilemma.' American Meteorological Society.

[4] Climate Studies Group Mona (CSGM). 2020. The State of the Caribbean Climate. Caribbean Development Bank. LINK

[5] Area in the northeast of the country with unique geological features.

[6] Climate Studies Group Mona (CSGM). 2020. The State of the Caribbean Climate. Caribbean Development Bank. LINK

[7] Simpson, M., D. Scott, M. New, R. Sim, D. Smith, and M. Harrison. 2009. An Overview of Modelling Climate Change Impacts in the Caribbean Region with Contribution from the Pacific Islands. Barbados: United Nations Development Programme.

[8] Johnson, W. 1973. Caribbean Food Crops Society Proceedings. Eleventh Annual Meeting. Background Paper on Water Situation in Barbados.

[9] AQUASTAT. 2018. Barbados. Total renewable water resources per capita (m^3/inhabitant/year).

[10] Based on the Falkenmark water stress indicator, a country is under absolute water scarcity if its renewable water supply drops below 500 m^3 per capita per year.

[11] UN WATER. 2023. Progress on Level of Water Stress. LINK

[12] International Federation of Red Cross and Red Crescent Societies (IFRC). 2010. DREF operation final report; Caribbean: drought. Situation report, International Federation of Red Cross and Red Crescent Societies, 6.

[13] https://tradingeconomics.com/barbados/food-inflation

[14] Barbados Today. 23 January 2023. Fuel Bill nearly doubles, food bill also sees major jump. LINK

[15] Resilient Caribbean Initiative. 2021. Gender, Climate and Agriculture Profile. Barbados.

[16] Government of Barbados. 2021. Update of the first Nationally Determined Contribution. LINK

B. PROJECT DESCRIPTION

Project description

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the PIF guidance document. (Approximately 3-5 pages) see guidance here

The project objective is to accelerate the transition to climate-resilient and low-emission, gender-sensitive agrifood systems and to strengthen the adaptive capacity of farmers in Barbados. This will be achieved by addressing the following key barriers, which limit climate change adaptation and water and land productivity across the island: i) limited use of agrometeorological information in agricultural decision making at the

individual farm and national levels; ii) limited adoption of climate-resilient and low-emission food production technologies and practices due to insufficient technical knowledge and skills and limited access to finance; iii) weak organizational capacity and business acumen of certain commodity-based farmer associations; and iv) insufficient private sector engagement in building climate-resilient, gender-sensitive agrifood systems.

To achieve the above objective, the project will be organized in the following four components: (i) Climate-responsive, gender-sensitive decision-making for resilient agrifood systems; (ii) Climate-resilient, gender-sensitive food production; (iii) Low-emission, gender-sensitive food production; and (iv) Gender-sensitive monitoring and evaluation (M&E) and communications.

COMPONENT 1: Climate-responsive, gender-sensitive decision-making for resilient agrifood systems

Outcome 1.1: Improved decision-making for gender-sensitive climate change adaptation and resilience action at national and farm levels

This component will improve existing weather stations to include the capacity to collect additional weather information important for agriculture. A key piece of information currently missing is evapotranspiration. Such measurement is important to make decisions on irrigation and can also be combined with additional data to assess the risks of plant and animal diseases. This component will also finance additional agrometeorological stations in farming areas, which are not yet sufficiently covered so as to strengthen the national agrometeorological observation network. Additionally, farmers will be provided with inexpensive agrometeorological tools and equipment for on-farm use to foster the consideration of agrometeorological data in production planning and operational decisions.

The component will improve the existing web-based system to analyze and disseminate agrometeorological datasets and involve a downscaled climate modelling exercise to optimize the adequacy of future climate projections for Barbados and inform agricultural policies and practices. Suitable channels to effectively reach farmers will be identified. In particular, this component will introduce an SMS-based system to proactively provide agrometeorological information directly to subscribers' mobile phones. It will also provide training on the interpretation and use of agrometeorological data and the operation and maintenance of the agrometeorological stations and tools to Government officials, including extensionists, and farmers.

Agrometeorological information will target the specific temporal (e.g., seven days) and sub-seasonal and seasonal (long-range) forecasts and spatial scale (e.g., location specific forecasts) and user needs (e.g., impact-based forecasts). It is crucial to ensure that climate information is contextual and credible, and users trust and understand it. A gender perspective must be applied to identify the differential needs of male and female users and take these into account when designing new climate advisory products and services. Informed users can better understand and use available climate information and services, assess gaps, and provide constructive feedback to improve them further. Fostering or promoting an informed user community through gender-sensitive public outreach programs (e.g., climate information, education, communication campaigns, awareness-raising activities, and training programs) is critical before collecting end-user feedback and evaluating the agrometeorological services.

COMPONENT 2. Climate-resilient, gender-sensitive food production

Outcome 2.1: Increased food production using climate-resilient, gender-sensitive practices and technologies

This component will strengthen the technical capacity of male and female Barbadian farmers to adopt tested technologies and practices that have proven to increase climate resilience while improving the efficient use of resources. Demonstration plots and operations will be established across the country to showcase these and provide hands-on gender-sensitive training to farmers and extensionists, using proven adult and peer-to-peer learning methodologies. The training will cover locally appropriate nature-based agricultural practices with high adaptation potential and mitigation co-benefits, such as the integration of nationally important fruit trees into croplands, minimal-tillage farming, integrated nutrient management, integrated pest management including use of ecological pesticides, attractant/repellent plants and biological control, crop diversification and rotation, mulching and planting of legumes as cover crops, amongst others. The potential incorporation of nutrient-dense indigenous agriculturally important plant species not currently in the food stream, which are adapted to the local environment and tend to be more drought- and disease-resistant, will be explored at the PPG stage.

Demonstration sites will also showcase innovative climate-responsive, gender-sensitive technologies for food production, including greenhouse structures, soilless cultivation systems (e.g., solar hydroponics[1][17], aeroponics), on-farm rainwater harvesting and storage infrastructure and solar-powered drip irrigation systems. Currently, FAO is implementing a **water-energy-food nexus** project (US$1 million) under the Mexico-CARICOM-FAO Initiative ”Cooperation for Adaptation and Resilience to Climate Change in the Caribbean” (“Resilient Caribbean Initiative” in short). It is supporting pilots to test rainwater harvesting and solar-powered efficient irrigation with small farmers and to assess the financial and social feasibility of such interventions. Their adoption is expected to increase water productivity while reducing demand for fossil fuels, which would have been used to power traditional pumps. Even if the results of the pilot phase are not yet available, they are expected to become available towards the end of 2023 and can inform the detailed design of the proposed project. The **combined adaptation and mitigation approach** will contribute to lowering production costs in the long run and foster resilience of producers.

The technologies and practices supported will be demonstrated through **Farmer Field Schools** (FFS), an approach developed by FAO that brings together a group of farmers, livestock herders or fisherfolk to learn how to shift towards more sustainable production practices, by better understanding complex agro-ecosystems and by enhancing ecosystem services. A FFS group meets regularly during a production cycle, setting up experimentation and engaging in hands-on learning to improve skills and knowledge that will help adapt practices to their specific context. The FFS empowers individuals and groups to move towards more sustainable practices and improve livelihoods[2][18].

A similar training approach will be taken to foster the sustainable expansion of resilient aquaculture and aquaponics systems in Barbados. Beforehand, a detailed feasibility study focused on the rearing of specific species will be conducted to assess the business case. The latter will inform the development of resilient aquaculture manuals and will provide the basis for the private sector engagement activities described below.

These activities will build on the experience gained with the USD 463,000 **"Towards a Caribbean Blue Revolution"** project that established a new aquaponics training facility in a private farm (the Adams Aquafarm), developing the capacity to upscale and implement further aquaponic investments. Aquaponics is a technique that combines hydroponics and aquaculture in a system that cultivates plants in recirculated aquaculture water. The project demonstrated that aquaponics addresses the two key issues that Barbados is facing in addition to climate change: scarcity of water and soil. The project closed in 2019, and almost four years later this private-run facility is still operational and expanding. Under the Resilient Caribbean Initiative described earlier, a USD 600,000 project on *resilient aquaculture for food security and wellbeing* is currently under implementation in four other SIDS in the region. Lessons learned and data from this project will be used to further develop the proposed BATCRAS project.

All proposed training interventions will acknowledge gender-based constraints and ensure women's and men's equitable access to the benefits associated with these. In an effort to avoid reinforcing gender inequalities and leverage gender-based opportunities, the project will collaborate with **women producer associations and gender specialists** to map out how existing access barriers can be addressed and how equal participation of both women and men can be ensured. Public-private dialogues will also be supported to enhance enforcement of agricultural policies, ensuring that women and men are treated equally and that women have equitable access to the resources they need for their livelihoods. The project will also emphasize engagement of young entrepreneurs and incentivize their participation through the application of innovative approaches to farming and the introduction of climate-resilient and gender-sensitive technologies in agriculture.

Table 1. Selection of practices and technologies based on climate change rationale

Main climate change hazard/impact addressed	Practice/technology proposed	Global Environmental Benefits/Co-benefits
Increased number of hot days and nights	• Solar-powered drip irrigation • Agroforestry • Natural shade • Soil conditioning • Use of high-yield crop varieties and animal breeds that are resistant to specified temperature increases	• Reduced greenhouse gas emissions • Carbon sequestration • Increased land productivity • Increased water productivity • Increased conservation of agrobiodiversity
Increased number of consecutive dry days	• Increased use of agrometeorological tools and gender-sensitive technologies • More proactive and target group- oriented dissemination	

	of weather information for agricultural decision-making • Crop and animal diversification • Vermicomposting • Rainwater harvesting • Minimal-tillage farming • Use of high-yield crop varieties and animal breeds that are resistant to droughts • No-burn agriculture with shredding	
Flooding, soil erosion, landslides	• Organic fertilizers • Integrated nutrient management, solar-powered fertigation systems • Integrated pest management • Soil restoration • Crop rotation • Terracing (Scotland district) • Contour trenching • Protected agriculture • Use of high-yield crop varieties and animal breeds that are resistant to pests and diseases	
Stronger winds	• Wind breaks • Protected agriculture	
Decline of agricultural income, increased household food insecurity	• Crop diversification • Mixed production systems • Resilient aquaculture • Solar-powered soilless cultivation systems	

	(hydroponics, aquaponics, aeroponics)	

Outcome 2.2 Increased private sector engagement in climate-resilient, gender-sensitive food production

The agriculture sector requires **strong farmer associations** and partnerships with various private sector actors to catalyze adaptation and resilience action. Drawing from the FFS concept, FAO developed the **Farm Business School** (FBS) approach by increasing emphasis on profitability and the entrepreneurial spirit of farmers. It increases emphasis on innovation in marketing, enterprise and pre- and post-harvest technologies. The FBS seeks to empower men and women farmers, enhance trust, and collaboration between farmers and other value chain actors, particularly the private sector, to make lasting contributions to the sustainable livelihoods of targeted households. This approach will form the basis of a climate-responsive and gender-sensitive business development and organizational strengthening programme for farmer associations. A key approach will be to link existing strong associations (poultry, pig) with weaker or nascent ones. The training will seek to improve governance procedures and will include guidance on how to meet quality and quantity quotas, for example. It will also cover the identification of suitable financiers, the development of marketing strategies, mentorship and strategic advice in business plan development and implementation, amongst others. On the one hand, it will strengthen internal planning, coordination, policy influence and resource mobilization of established farmers associations. On the other hand, it will foster peer-to-peer learning, knowledge sharing and closer collaboration between well-established commodity groups and those under formation. These interventions will pay particular attention to encouraging the representation of women and youth in decision-making processes, thus reinforcing their role in sector leadership.

Effective adoption of climate-resilient and gender-sensitive technologies, such as solar hydroponics or aquaponics, is often hindered by the lack of **qualified on-island suppliers and service providers** that can supply the systems (and spare parts if needed) and provide operation and maintenance services. Therefore, Component 2 will provide specialized training on climate-resilient, gender-sensitive technologies for food production to local businesses so they can commercialize their operations and assist producers who oftentimes depend on overseas suppliers. It will facilitate the transition to more sustainable and innovative ways of producing food, supporting income diversification and strengthening producers' livelihoods.

The project will not only strengthen the business acumen of farmers, but also work with commercial banks and other financial institutions to **develop gender-sensitive financial products and services** enabling small farmers to invest in climate-resilient practices and technologies. This will include revising tools and methodologies to assess the creditworthiness of small farmers and developing specific metrics for the agriculture sector, for example. Due consideration will be given to eliminating access barriers faced by women farmers. A key stakeholder in this context is The Barbados Bankers Association, with which the MAFS has already entered into dialogue. The discussions are ongoing and will inform the further design of the proposed project. Collaborations with private sector actors under FAO's technical cooperation project "Driving innovative financing and sustainable investments toward food system transformation and achieving SDGs in the Caribbean" will also support the planned activities.

Partnerships between on-island agricultural technical vocational education and training institutions like the SJPI and BCC and private sector entities such as the aquaponics training facility mentioned above will be built to attract young men and women into climate-resilient food production.

COMPONENT 3. Low-emission, gender-sensitive food production

Outcome 3.1: Increased food production using low-emission, gender-sensitive practices and renewable energy technologies.

Although SIDS contribute less than 1% of global GHG emissions, it must be considered that a significant proportion is attributable to the AFOLU sector. Furthermore, Barbados' high dependency on imported fossil fuels for on-farm irrigation systems increases the vulnerability of farmers to exogenous shocks and limits the uptake of more resilient, soilless food production solutions (e.g., hydroponics, aquaponics). Therefore, the proposed project aims not only to strengthen the adaptive capacity of farmers, but also to put the sector on a low-emission path. To encourage and support farmers across the island to produce food in a more climate-friendly manner and to link the agriculture sector to the country's energy transition, demonstration sites will be established at various locations to showcase renewable energy technologies at the farm level and nature-based practices with high mitigation potential and adaptation co-benefits. Hands-on FFS training at these sites will allow farmers, extension officers and other relevant actors to learn about their practical application and the associated climatic, environmental and livelihood benefits. Specifically, the following technologies and practices will be demonstrated:

- Solar-powered, energy-efficient irrigation, hydroponic and aquaponic systems. Shifting to clean energy carriers and adopting energy-efficient solutions for pumping of water and closed loop cultivation systems lowers agricultural GHG intensity. Successful implementation examples resulting from the above-mentioned water-energy-food nexus project could serve as "lighthouse farms" inspiring other producers to integrate renewable energy technologies into their own operations.
- Agroforestry. Integrating trees into croplands enhances carbon sequestration. Nitrogen-fixing trees and crops add large quantities of usable nitrogen to the soil which can lower the need for fossil-fuel-based fertilizers.
- Combined crop-livestock systems. Applying on-farm manure on cropland optimizes nutrient recycling and reduces the need for GHG-intense chemical fertilizers. Using agricultural residues as inputs for animal feed or composting makes the burning of crop residues burning redundant.
- Precision farming tools. Technologies like Variable Rate Nutrient Application (VRNA) help prevent overuse of fertilizers and enhance agricultural productivity and crop quality.

- Composting. Replacing synthetic fertilizers with compost helps lower the extent of nitrogen leaching and loss and reduces GHG emissions from their manufacturing and transportation.

- Improved livestock manure management practices. Reducing the storage time of manure, covering it, avoiding straw/hay bedding, using digesters to convert it into methane for energy use or recycling it to use it as compost are effective techniques to curb GHG emissions in the livestock subsector.

- Optimized grazing land management practices. To augment the carbon sequestration capacity of grazing soils and reduce the release of nitrous oxide, controlling grazing intensity, improving grass varieties, and putting in place fire management strategies are key.

- Minimal-tillage farming, crop rotation and growing of perennial/cover crops. These practices increase the soil organic carbon stocks of land that is already under agricultural production and yield multiple environmental and social benefits.

- No-burn agriculture with shredding. Recycling crop resides through shredding is a sustainable and climate-friendly alternative to slash-and-burn agriculture.

As demonstrated above, this component follows the same methodological approach as Component 2, but with a focus on carbon sequestration and avoidance of GHG emissions. As such, training under this component will also acknowledge gender-based constraints and ensure women's and men's equitable access to the benefits associated with these. Although it appears separately in the project structure, in practice it will be strongly linked with Component 2. This is in line with the water-energy-food nexus approach, a concept promoting both climate change adaptation and mitigation solutions for the agriculture sector.

Figure 2. Theory of change

4. Gender-sensitive M&E and communications

Outcome: Project implemented according to results-based management principles

Previous experiences in Barbados and the region show the importance of addressing administrative challenges early on. Project design should not only define “what” and “why” project activities were selected, but also “how” they will be implemented. Delays in project implementation are often due to limited administrative capacity in areas such as financial management and procurement. Such delays risk reducing funding and attention to the terminal evaluation, a key moment to learn lessons from the project.

The proposed project implementation period is five years.

Since this project will be the one of the first to be implemented with FAO as the Implementing Agency and the Ministry of Agriculture and Food and Nutritional Security (MAFS) as the main Executing Agency, responsible for coordination of all activities, this component is required to dedicate specific attention and resources to the efficient and timely execution of activities. The Barbados Meteorological services will be a key partner in the execution of Component 1, while the BAS and the BADMC will be strongly engaged in Component 2.

To enable results-based project management from the onset, this component will establish a gender-sensitive M&E system to continuously track the adaptation and mitigation efforts and facilitate a high-quality mid-term and final evaluation of the project. An M&E Specialist who is well-versed in the use of GHG accounting methodologies and tools, including FAO's EX-Ante Carbon-balance Tool (EX-ACT), as well as gender-sensitive monitoring will be engaged to identify the amounts of carbon sequestered/GHG emissions avoided thanks to the proposed activities. This component will also entail the design and implementation of an overarching, gender-sensitive communications strategy to foster public awareness on how the project interventions contribute to climate-resilient, low-emission, gender-sensitive local agrifood systems. It will help educate the general public about the impacts of climate change on food production and the sources of GHG emissions in the AFOLU sector, as well as effective approaches and technological solutions to limit these. The strategy will target a variety of traditional and social media and will include the production of visual, audio and audio-visual materials, the preparation and dissemination of press releases, human-interest stories, impact stories, op-eds and blog posts at regular intervals, as well as public outreach events.

Gender-sensitive knowledge management and learning approaches will be integrated along the following two pillars: the Farmer Field/Business School approach and the collaboration with farmers associations. The provision of simple meteorological information with a direct clear benefit for the users will ensure an initial engagement with beneficiaries to open the way to more complex types of innovation that require behavioral change, such as the introduction of climate-resilient technologies. The initial provision of meteorological information will also allow the project to identify farmers who are more open to innovation. The collaboration with TVET institutions and the University of the West Indies – which participated in project design – will also be actively engaged to disseminate the lessons learned.

Project area. With demonstration sites showcasing soilless cultivation and aquaculture systems across the island, the proposed project will be nation-wide in scope. However, activities centered on climate-resilient practices and technologies for traditional open field production will be implemented on holdings in selected productive landscapes. A description of these and a map of the locations is provided in Annex C.

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[1] Hydroponics is the method of growing agricultural crops without the use of soil. Instead of soil, various inert growing media, also called substrates, are used. Source: www.fao.org/3/i4021e/i4021e.pdf

[2] https://www.fao.org/farmer-field-schools/home/en/

Coordination and Cooperation with Ongoing Initiatives and Project.

Does the GEF Agency expect to play an execution role on this project?

If so, please describe that role here. Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing

Baseline programs. Barbados is receiving GCF support to address its adaptation needs through two programs related to the water sector.[1][19] Both projects seek to address the climate crisis and limited water availability, which are already affecting food security. Specifically, the 3R-CReWS project is seeking to increase food production as an adaptation measure by making more water accessible through investment in the circular economy (i.e., wastewater management). Similarly, the WSRN S-Barbados project aims to create sustainable and resilient water supply by implementing renewable energy solutions as well as by increasing water capacity through rainwater harvesting and water storage, among others.

Given BATCRAS' integrated objective of reducing GHG emissions in food production, coordination will also be sought with the GEF-funded "Sustainable Management and Resilient Thinking for our Energy Revolution" (SMARTER) project in collaboration with the Ministry of Energy and Business. In fact, the expected outcomes of SMARTER, such as strengthened institutional capacity for low-emission energy planning and electricity system purview, enabling conditions for bioenergy deployment and an active pipeline of decentralized renewable energy projects, will be essential in Barbados' transition to low-emission agrifood systems.

Baseline programs funded through national resources include the Farmers' Empowerment and Enfranchisement Drive (FEED) programme[2][20], seeking to reduce agricultural imports to the island and augment national food and nutrition security, as well as a small project on 3D weather stations in farming districts[3][21], led by the Barbados Meteorological Services (BMS).

FAO will leverage the experience gained and lessons learned as part of the ongoing water-energy-food nexus project under the Resilient Caribbean Initiative. Solutions tested, such as rainwater harvesting structures, solar-powered drip irrigation systems and soilless cultivation methods, will be scaled out to a larger number of farmers, and decision-support tools developed (e.g., to identify the most suitable sites for water-energy-food nexus interventions) will be applied. Lessons from the resilient aquaculture project, implemented in other four SIDS under said Initiative, will be applied in the proposed project as alternatives for income diversification, local fish production and conservation of marine resources. FAO will also harness experience from the GEF-funded "CSIDS-SOILCARE Phase 1: Caribbean Small Island Developing States (SIDS) multi-country soil management initiative for integrated landscape restoration and climate-resilient food systems", which complements the proposed project by strengthening the policy, legal and institutional framework for achieving land degradation neutrality and climate resilience in Barbados. Other relevant projects fall under

FAO's Technical Cooperation Programme (TCP) and are focused on innovative protected cultivation systems and sustainable financing mechanisms for the regional food system transformation.

As it relates to future interventions, Barbados will benefit from the "Caribbean Resilient Economies and Sectors'' (RESET) project. This five-year project funded by the United States Agency for International Development (USAID) seeks to increase public and private investment in key sectors for climate resilience and green-blue economic growth, and hence bears strong potential for complementarity and coherence.

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[1] These are (i) "Water Sector Resilience Nexus for Sustainability in Barbados" or WSRN S-Barbados project (FP060, https://www.greenclimate.fund/project/fp060), and (ii) "The R's (Reduce, Reuse and Recycle) for Climate Resilience Wastewater Systems in Barbados" or 3R-CReWS project (FP191, https://www.greenclimate.fund/project/fp192)

[2] The three-year FEED programme was planned, implemented and managed by the Barbados Agricultural Development and Marketing Corporation (BADMC) from April 2019 (https://badmc.org/feed-program/)

[3] Barbados Government Information Service. 2022. Automatic Stations To Measure Weather Across Communities. LINK

Core Indicators

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
1000	0	0	0

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.2 Area of landscapes under third-party certification incorporating biodiversity considerations

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
1,000.00			

Indicator 4.4 Area of High Conservation Value or other forest loss avoided

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.5 Terrestrial OECMs supported

Name of the OECMs	WDPA-ID	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Documents (Document(s) that justifies the HCVF)

Title

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	82382	0	0	0
Expected metric tons of CO_2e (indirect)	0	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	70,147			
Expected metric tons of CO_2e (indirect)				
Anticipated start year of accounting	2025			
Duration of accounting	20			

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	12,235			
Expected metric tons of CO_2e (indirect)				
Anticipated start year of accounting	2025			
Duration of accounting	20			

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Female	916			
Male	2,136			
Total	**3,052**	**0**	0	**0**

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

Area of landscapes under improved practices (ha): Based on 2020 data, Barbados has approximately 10,000 ha of agricultural land (see map in annex C). The project seeks to bring at least 10% of this area under better, more climate-friendly production practices.

Greenhouse Gas Emissions Mitigated (metric tons of CO2e): The target was defined using FAO's EX-Ante Carbon-balance Tool (EX-ACT), assuming that farmers will adopt more climate-friendly agricultural practices and renewable energy technologies as a result of the proposed interventions.

Number of direct beneficiaries: It is expected that at least 70% of the total number of registered farmers (70% of 4,360 = 3,052) will benefit from novel climate advisory products. Of these, it is expected that at least 30% will be women.

META INFORMATION – SCCF

LDCF **false**	SCCF-B (Window B) on technology transfer **false**	SCCF-A (Window-A) on climate Change adaptation **true**

Is this project LDCF SCCF challenge program?

false

This Project involves at least one small island developing State(SIDS).

true

This Project involves at least one fragile and conflict affected state.

false

This Project will provide direct adaptation benefits to the private sector.

true

This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs).

false

This project will collaborate with activities begin supported by other adaptation funds. If yes, please select below

Green Climate Fund **true**	Adaptation Fund **false**	Pilot Program for Climate Resilience (PPCR) **false**

This Project has an urban focus.

false

This project will directly engage local communities in project design and implementation

true

This project will support South-South knowledge exchange

true

This Project covers the following sector(s)[the total should be 100%]: *

Agriculture	70.00%
Nature-based management	0.00%
Climate information services	30.00%

Coastal zone management	0.00%
Water resources management	0.00%
Disaster risk management	0.00%
Other infrastructure	0.00%
Tourism	0.00%
Health	0.00%
Other (Please specify comments)	0.00%
Total	100.00%

This Project targets the following Climate change Exacerbated/introduced challenges:*

Sea level rise **false**	Change in mean temperature **true**	Increased climatic variability **true**	Natural hazards **false**
Land degradation **true**	Coastal and/or Coral reef degradation **true**	Groundwater quality/quantity **false**	

CORE INDICATORS – SCCF

	Total	Male	Female	% for Women
CORE INDICATOR 1 Total number of direct beneficiaries	3,052	2,136.00	916.00	30.01%
CORE INDICATOR 2 (a) Area of land managed for climate resilience (ha) (b) Coastal and marine area managed for climate resilience (ha)	4,000.00 0.00			
CORE INDICATOR 3 Number of policies/plans/ frameworks/institutions for to strengthen climate adaptation	0.00			
CORE INDICATOR 4 Number of people trained or with awareness raised	2,180	1,526.00	654.00	30.00%
CORE INDICATOR 5 Number of private sector enterprises engaged in climate change adaptation and resilience action	10.00			

Risks to Project Preparation and Implementation

Summarize risks that might affect the project preparation and implementation phases and what are the mitigation strategies the project preparation process will undertake to address these (e.g. what alternatives may be considered during project preparation-

such as in terms of consultations, role and choice of counterparts, delivery mechanisms, locations in country, flexible design elements, etc.). Identify any of the risks listed below that would call in question the viability of the project during its implementation. Please describe any possible mitigation measures needed. (The risks associated with project design and Theory of Change should be described in the “Project description” section above). The risk rating should reflect the overall risk to project outcomes considering the country setting and ambition of the project. The rating scale is: High, Substantial, Moderate, Low.

Risk Categories	Rating	Comments
Climate	Moderate	The climate risks Barbados is facing are high, and the project has been designed to address these. Specifically, as illustrated in Figure 1, the island and its agriculture sector are prone to the adverse impacts of increasing atmospheric and sea temperature, changing seasonal distribution of rainfall, sea level rise and the increasing intensity and/or frequency of tropical cyclones. As such, there is a risk that farmers benefitting from the project experience loss and damage of assets due to climate change induced or compounded droughts, floods, soil erosion, landslides, soil/aquifer salinization and storms. These assets may include equipment and materials provided by the project. Such loss and damage can affect the ability of stakeholders to actively participate in the project and to embrace changes, e.g., regarding the adoption of new technologies. It may also affect the capacity of highly vulnerable farmers to make larger investments in sustainable agriculture as basic needs come first (e.g., housing). At the project preparation stage, the proposed project locations and the vulnerability of targeted communities will be studied carefully, and a comprehensive risk management framework will be prepared to alleviate potential damage to and disruption of operations and technologies to be implemented. Furthermore, the technical specifications for any equipment and

		materials to be procured under the project will be developed with these risks in mind, and guidance on agricultural disaster risk management strategies will be incorporated into training curricula. During project implementation, early warning systems will be monitored closely. The core purpose of the proposed project is to encourage farmers to adopt selected practices and technologies that will strengthen their long-term resilience, enable them to cope with the above risks and keep adverse climate impacts on agricultural production to a minimum. The use of renewable energy as an adaptation strategy will result in lower expenditures and improved income.
Environment and Social	Low	Introduction and expansion of climate-resilient and low-emission technologies supported by the proposed project may require changing jobs that are currently linked with fossil fuel power generation. At the project preparation stage, the dialogue with local TVET institutions will be sought to explore how training needs can be addressed by the project so that these can be replaced with new, climate-friendly jobs. The project will promote sustainable management of water, soils and nutrients and integrated management of pests and diseases. Emphasis will be placed on the use of organic fertilizers, ecological pesticides, composting, mulching and other environmentally friendly practices. Agrochemical use will be according to best available practices.
Political and Governance	Low	The project has been developed based on a request from the Government of Barbados. Hence, it

		is closely aligned with political will and directives. The risk that the priorities and level of commitment change in the near future is considered low as the need for ambitious adaptation and mitigation action in the agriculture sector is enshrined in the recently adopted Climate Change and Agriculture Policy, and the next general elections are scheduled to take place in 2027. Drawing on its long-standing experience and established risk management systems, FAO will mitigate any sudden political risks by coordinating closely and consistently with relevant government partners, including at the higher level.
Macro-economic	Substantial	The macro-economic situation of Barbados is challenging with high inflation rates in 2022 and 2023. Proper planning and lessons applied from the procurement of similar items under the Resilient Caribbean Initiative will allow to identify best value for money through service providers in the Caribbean for the procurement of equipment. Component 3 places emphasis on a strong project implementation unit and M&E system.
Strategies and Policies	Low	Given the climate challenges faced by the country, a significant change of strategies and policies is not likely. As stated above, the Government of Barbados has put in place a holistic framework to foster sustainable development and integrated resilience across sectors, and recently adopted the Climate Change and Agriculture Policy.
Technical design of project or program	Moderate	The proposed project presents complex design features. For instance, aquaponics and hydroponics or solar-powered

		irrigation are technology-intensive activities. Yet, the longstanding experience FAO has, both in the country, the region and at the global level, will help mitigate risks such as malfunction or downtime of systems. Lessons learned from ongoing initiatives will be leveraged.
Institutional capacity for implementation and sustainability	Moderate	The identified government partners appear to have a suitable profile to assume the leadership on execution and ensure the sustainability of results. As part of the FAO's Operational Partners Implementation Modality (OPIM), a more detailed capacity assessment will be conducted at the project preparation stage. If needed, specific capacity-building measures will be undertaken.
Fiduciary: Financial Management and Procurement	Substantial	The capacity to address fiduciary aspects is limited. That is why the project will emphasize a strong project management unit and proper M&E through Component 3. FAO will ensure that the rules and procedures of the GEF are applied and through the OPIM modality will identify gaps in executing entities and support them in mitigating perceived management risks.
Stakeholder Engagement	Low	So far, national stakeholder demonstrated strong interest in the proposed interventions and have provided constructive feedback to inform the PIF. Additional consultations, in particular with individual farmers, local businesses, commercial banks, civil society organizations, women producer groups and youth, will be undertaken at the project preparation stage.
Other		
Financial Risks for NGI projects		

Overall Risk Rating	Moderate	

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Describe how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how. (max. 500 words, approximately 1 page)

The proposed project is well-aligned with Priority Area 1 (Supporting the Adaptation Needs of SIDS) of the Special Climate Change Fund. It covers the four priority adaptation themes (Agriculture, Food Security and Health; Water; Nature-based Solutions; Early Warning and Climate Information Systems) and the three levers of transformation (policy coherence and climate mainstreaming; knowledge exchange and collaboration; strengthened governance) of the GEF-8 Strategy on Adaptation to Climate Change are anchored in its intervention logic.

As a SIDS that does not fall within the category of Least Developed Countries (LDCs), Barbados faces a considerable gap in adaptation finance, making it difficult to holistically address structural vulnerabilities to climate change in the agriculture sector. The SCCF Programming Strategy effectively mirrors the climate and non-climate factors contributing to these vulnerabilities in Barbados, including salt-water intrusion, sea level rise, increased heavy rainfall, tropical storms, geographic isolation, limited land area, high energy costs, remoteness from international markets, limited economic diversity, a narrow resource base and a high debt-to-GDP ratio. Furthermore, the interventions supported under Priority Area 1 directly respond to the country priorities expressed in the NDC and, in particular, the Agriculture and Climate Change Policy. As such, proposed areas for adaptation support include the integration of agrometeorological data in decision-making; mainstreaming of nature-based solutions for agriculture (e.g., integration of trees into croplands, covering of soils with mulch/cover crops, integrated nutrient and pest management); rainwater harvesting; climate-resilient aquaculture and other resource-efficient solutions for income diversification (e.g., solar aquaponics, hydroponics); support to commodity-based farmer associations to strengthen their position in local markets and reduce national dependence on food imports; and building domestic capacity for adaptation through training of stakeholders at various levels.

Recognizing the urgency of transitioning to climate-resilient food production at scale, the project intends to collaborate closely with key private sector actors who can drive this transformation. Based on Barbados' recently adopted Agriculture and Climate Change Policy, the focus lies on innovative technologies like soilless cultivation systems (e.g., solar hydroponics, aquaponics, aeroponics) and solar-powered drip irrigation systems. Targeted actors include local businesses that can supply these technologies and provide operation and maintenance and even training services to support the transition from small-scale to commercial operations, but also commercial banks, which play a central role in catalyzing small farmers' access to adaptation finance. FAO's experience with such technologies in Barbados and other Caribbean islands will provide opportunities for South-South cooperation and learning.

In line with other priories of SCCF programming, the proposed project will foster partnerships between on-island, agriculture-oriented TVET institutions and the private sector (e.g., farmer associations operating demonstration sites, local businesses operating or supplying climate-resilient technologies for food production) to attract more youth to agriculture. Similarly, the project will collaborate with women producer groups to map out how existing access barriers can be addressed and how more women can

participate in the sector. The strengthened role of these groups in Barbados' agrifood system is critical to improve national food security under climate change.

As laid out in its NDC and Agriculture and Climate Change Policy, Barbados seeks to build resilience by combining adaptation and mitigation action. Since this cross-cutting approach is embedded in the proposed project, the latter is also aligned to the GEF-8 Climate Change Focal Area Strategy (Objectives 1.2 and 1.4 under Pillar 1), the GEF-8 framework of "Healthy Planet, Healthy People" and the Barbados National Energy Policy 2019-2030. In line with the water-energy-food nexus approach, fostering the adoption of renewable energy technologies at the farm level will not only help curb the sector's carbon footprint, but also reduce sectoral trade-offs and production costs in the long run, hence strengthening food security and livelihoods of producers. Promoting distributed power generation is aligned with the NDC. Furthermore, by demonstrating and training farmers on nature-based solutions with high mitigation and carbon sequestration potential (e.g., agroforestry; efficient fertilizer use; enhanced manure management; improved animal grazing intensity, pasture management and feed practices), BATCRAS will support actions aligned with the Koronivia process.

Beyond the NDC and the Agriculture and Climate Change Policy, the broader legal and policy framework for climate change adaptation in Barbados is composed of the Proclamation of the Planning and Development Act (2022) and the Physical Development Plan (2022). The latter includes climate change considerations for the first time and is operationalized by the "Roofs to Reefs Programme" (R2RP), a holistic, whole-of-Government initiative to foster sustainable and climate-resilient development in Barbados. Specifically, its objectives to increase freshwater storage capacity and water use efficiency, to reduce GHG emissions through the deployment of distributed renewable energy generation, and to decrease land-based sources of marine pollution through more sustainable land use practices highlight the relevance of the proposed interventions. Furthermore, the Strategic Human Resource Management and Transformation Plan (2023) stresses the need to strengthen the capacity of the Barbadian workforce, including farmers and agricultural workers, to adapt to climate change.

No conflicting priorities have been identified.

The proposed project will contribute to regional resilience by supporting CARICOM's envisioned 25% reduction in the regional food import bill by 2025. It is also closely aligned with the claims of the Samoa Declaration on Climate Change in the Context of Sustainable Development for SIDS (2018), which underscores the urgency of limiting global warming to 1.5°C above pre-industrial levels and the pressing need to close SIDS' adaptation finance gap in order to build long-term resilience.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

We confirm that gender dimensions relevant to the project have been addressed as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

Stakeholder Engagement

We confirm that key stakeholders were consulted during PIF development as required per GEF policy, their relevant roles to project outcomes and plan to develop a Stakeholder Engagement Plan before CEO endorsement has been clearly articulated in the Project Description (Section B).

Yes

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities:

Civil Society Organizations: Yes

Private Sector: Yes

Provide a brief summary and list of names and dates of consultations

Gender.

The 2020 review of Women, Business and Law of the World Bank[1][22] rated a 76.9 the gender disparities in Barbados (100 has the lowest disparities). The highest disparities are in terms of pay and parenthood. Women experience poverty at a higher rate than men. The number of men involved in agriculture is twice that of women in the sector and there is more land in the hands of men than women though the number of women generally with access to land is higher than men. There are also gender disparities in application to the Farmers' Empowerment and Enfranchisement Drive (FEED), a national programme aimed at creating opportunities in the agricultural sector for 2000 farmers and other agricultural entrepreneurs. Food security and malnutrition are key concerns for women. That is why the project intends to target specifically women who tend to have a strong role in the production of vegetable versus other agricultural activities. Indeed, the Farmer Field School has an established approach to empower women.

A focused online survey of key stakeholders and two virtual national stakeholder consultations were carried out on 12 October and 8 December 2022. The online survey served to identify and scope broad priority intervention areas as it relates to agriculture in the context of climate change in Barbados. Based on an in-depth desktop review and the survey results, an initial project concept was drafted and presented to a larger number of stakeholders on 12 October 2022. During the meeting, the proposed project structure was discussed, and stakeholders had a chance to express their concerns, provide additional information and make suggestions for improvement. These were carefully analyzed and helped to revise and further develop the project structure, which was presented for validation during the second consultation. The latter enabled FAO to fill remaining gaps and capture additional inputs to the final version. As described below, ad-hoc phone calls, virtual meetings and email exchanges with key stakeholders were also part of the process.

Persons consulted via focused online survey:

Name	Organization	Position
Ms Claire Best	Division of Energy - Ministry of Energy and Business	Monitoring and Evaluation Specialist
Mr Frederick Inniss	Barbados Agricultural Development and Marketing Corporation	Chief Executive Officer
Ms Lani Patricia Edghill	Graeme Hall Nature Sanctuary	Environmental Planner
Dr Leo Brewster	Coastal Zone Management Unit	Director

Mr Sabu Best	Barbados Meteorological Services	Director
Ms Samantha J. Cummins	Division of Energy - Ministry of Energy and Business	Chief Legal Officer

Persons who participated in national stakeholder consultation on 12 October 2022:

Name	Organization	Position
Mr Alex Ifill	Barbados Water Authority	Manager - Water Resources and Environmental Management
Ms Allison Reeves	Environmental Protection Department - Ministry of Environment, National Beautification, Green and Blue Economy	Technical Officer
Ms Beverley Wood	Government Analytical Services	Director
Mr David Yawson	Centre for Resource Management and Environmental Studies - University of the West Indies	Director/Lecturer
Mr Mark Griffith	CaribInvest West Indies, Limited	Chief Executive Officer
Ms Gina Belle	Ministry of Environment and National Beautification, Green and Blue Economy	Coordinator
Mr Glenn Marshall	Ministry of Agriculture, Food and Nutritional Security	Senior Agricultural Officer
Ms Jaime Paul	Barbados Water Authority	Hydrogeologist
Mr Jamekal Andwele	Barbados Agricultural Development and Marketing Corporation	Manager - Agricultural Services Division
Ms Jamilla Sealy	Ministry of Environment and National Beautification, Green and Blue Economy	Assistant Project Coordinator
Mr Jatobi Greaves	Barbados Water Authority	Water Quality Technologist
Ms Joyce Leslie	Fisheries Division - Ministry of Environment and National Beautification, Green and Blue Economy	Chief Fisheries Officer
Ms Keeley Holder	Ministry of Agriculture, Food and Nutritional Security	Chief Agriculture Officer
Mr Kyron Barker	CARICOM Development Fund	Programme Specialist
Mr Michael James	Ministry of Agriculture, Food and Nutritional Security	Senior Agricultural Officer
Ms Michelle Wilson-Howard	Soil Conservation Unit - Ministry of Agriculture, Food and Nutritional Security	Senior Agricultural Assistant
Ms Nicole Austin	Barbados Water Authority	Water Quality Technologist
Mr Nigel Jones	National Botanical Gardens	Project Manager

Ms Raisa Ramdeen	Caribbean Agricultural Research and Development Institute	Plant Breeder
Ms Rean Gibson	Ministry of Social Care, Constituency Empowerment and Community Development	Research Analyst
Mr Steve Devonish	Natural Heritage Department	Director
Ms Tia Browne	Barbados Meteorological Services	Meteorologist
Mr William Hinds	Ministry of Energy and Business	Chief Energy Conservation and Renewable Energy Officer

Subsequent to the consultation, FAO reached out to additional stakeholders, including:

- Mr Travis Sinckler, Senior Environment Officer, Policy Research, Planning and Information Unit - Ministry of Environment and National Beautification, Green and Blue Economy
- Mr James Paul, Chief Executive Officer, Barbados Agricultural Society.

Mr Paul gathered inputs from the members of the organization (farmers representing different commodity groups) and shared them via email on 18 November 2022.

Persons who participated in national stakeholder consultation on 8 December 2022:

Name	**Organization**	**Position**
Mr Alex Ifill	Barbados Water Authority	Manager Water Resources and Environmental Management
Ms Allison Reeves	Environmental Protection Department - Ministry of Environment, National Beautification, Green and Blue Economy	Technical Officer
Ms Beverley Wood	Government Analytical Services	Director
Mr Brian Murray	Barbados Meteorological Services	Deputy Director
Mr David Yawson	Centre for Resource Management and Environmental Studies - University of the West Indies	Director/Lecturer
Mr Frederick Inniss	Barbados Agricultural Development and Marketing Corporation	Chief Executive Officer
Ms Jaime Paul	Barbados Water Authority	Hydrogeologist
Ms Jalisa Waterman	Barbados Water Authority	Hydrogeologist
Mr Jamekal Andwele	Barbados Agricultural Development and Marketing Corporation	Manager - Agricultural Services Division
Mr James Paul	Barbados Agricultural Society	Chief Executive Officer
Mr Jatobi Greaves	Barbados Water Authority	Water Quality Technologist
Ms Keeley Holder	Ministry of Agriculture, Food and Nutritional Security	Chief Agriculture Officer

Ms Leslie Sealy	Barbados Agricultural Development and Marketing Corporation	Manager - Extension Services
Mr Michael James	Ministry of Agriculture, Food and Nutritional Security	Senior Agricultural Officer
Ms Michaela Rock	Barbados Water Authority	Hydrogeologist
Ms Nicole Austin	Barbados Water Authority	Water Quality Technologist
Mr Nyah Nyhathu	Barbados Agricultural Management Company	Research Officer
Ms Raisa Ramdeen	Caribbean Agricultural Research and Development Institute	Plant Breeder
Mr Ricardo Marshall	Prime Minister's Office	Director - Roofs to Reefs Programme

Additionally, several ad-hoc conversations with representatives of the Ministry of Agriculture, Food and Nutritional Security (Chief Agriculture Officer, Senior Agricultural Officer) have taken place throughout the PIF development process, and FAO's direct engagement with Barbadian farmers through ongoing projects has helped to understand and capture their perspectives, needs and constraints.

The PIF was also shared with the Barbados Association of Non-Governmental Organizations (BANGO) to seek feedback on the interventions from relevant members. On 11 October 2023, comments were received from Dr Sonia Peter, Director of the Biocultural Education and Research Programme, and Dr Marcia Brandon, Secretary-General of BANGO and Managing Director/Founder of the Caribbean Centre of Excellence for Sustainable Livelihoods.

[1] https://openknowledge.worldbank.org/bitstream/handle/10986/35094/9781464816529.pdf

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in the section B project description?

Yes

Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE

Medium/Moderate

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)
FAO	GET	Barbados	Climate Change	CC STAR Allocation: CCM-1-4	Grant	875,742.00	83,195.00	958,937.00
FAO	SCCF-A	Barbados	Climate Change	SCCF-A Country allocation	Grant	2,627,226.00	249,586.00	2,876,812.00
Total GEF Resources ($)						**3,502,968.00**	**332,781.00**	**3,835,749.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

150000

PPG Agency Fee ($)

14250

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)

FAO	GET	Barbados	Climate Change	CC STAR Allocation: CCM-1-4	Grant	37,500.00	3,562.00	41,062.00
FAO	SCCF-A	Barbados	Climate Change	SCCF-A Country allocation	Grant	112,500.00	10,688.00	123,188.00
Total PPG Amount ($)						**150,000.00**	**14,250.00**	**164,250.00**

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
FAO	GET	Barbados	Climate Change	CC STAR Allocation	999,999.00
Total GEF Resources					**999,999.00**

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
CCM-1-4	GET	875,742.00	4949998
CCA-2-1	SCCF-A	2,627,226.00	15000002
Total Project Cost		**3,502,968.00**	**19,950,000.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Government of Barbados (MAFS, BADMC, BAMC, BMS, Ministry of Energy and Business, BWA)	In-kind	Recurrent expenditures	8800000
GEF Agency	FAO (Headuarters)	In-kind	Recurrent expenditures	1900000
Donor Agency	GCF, USAID, Global Affairs Canada, SRE/AMEXCID, EU	In-kind	Recurrent expenditures	5900000
Private Sector	Small local businesses	In-kind	Recurrent expenditures	1900000

Private Sector	Commodity-based farmer associations under the BAS	In-kind	Recurrent expenditures	462500
Civil Society Organization	Women and youth groups, environmental NGOs	In-kind	Recurrent expenditures	62500
Others	UWI-CERMES, CIMH, SPIJ, Barbados Community College (BCC)	In-kind	Recurrent expenditures	462500
GEF Agency	FAO (Subregional Office for the Caribbean)	In-kind	Recurrent expenditures	462500
Total Co-financing				**19,950,000.00**

Describe how any "Investment Mobilized" was identified

The project will evaluate sources of cofinancing during project preparation

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Jeffrey Griffin	4/12/2023	Hernan Gonzalez	+390657055382	hernan.gonzalez@fao.org

Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Name	Position	Ministry	Date (MM/DD/YYYY)
Yolande J. Howard	Permanent Secretary	MINISTRY OF ENVIRONEMNT AND NATIONAL BEAUTIFICATION, GREEN AND BLUE ECONOMY	7/17/2023

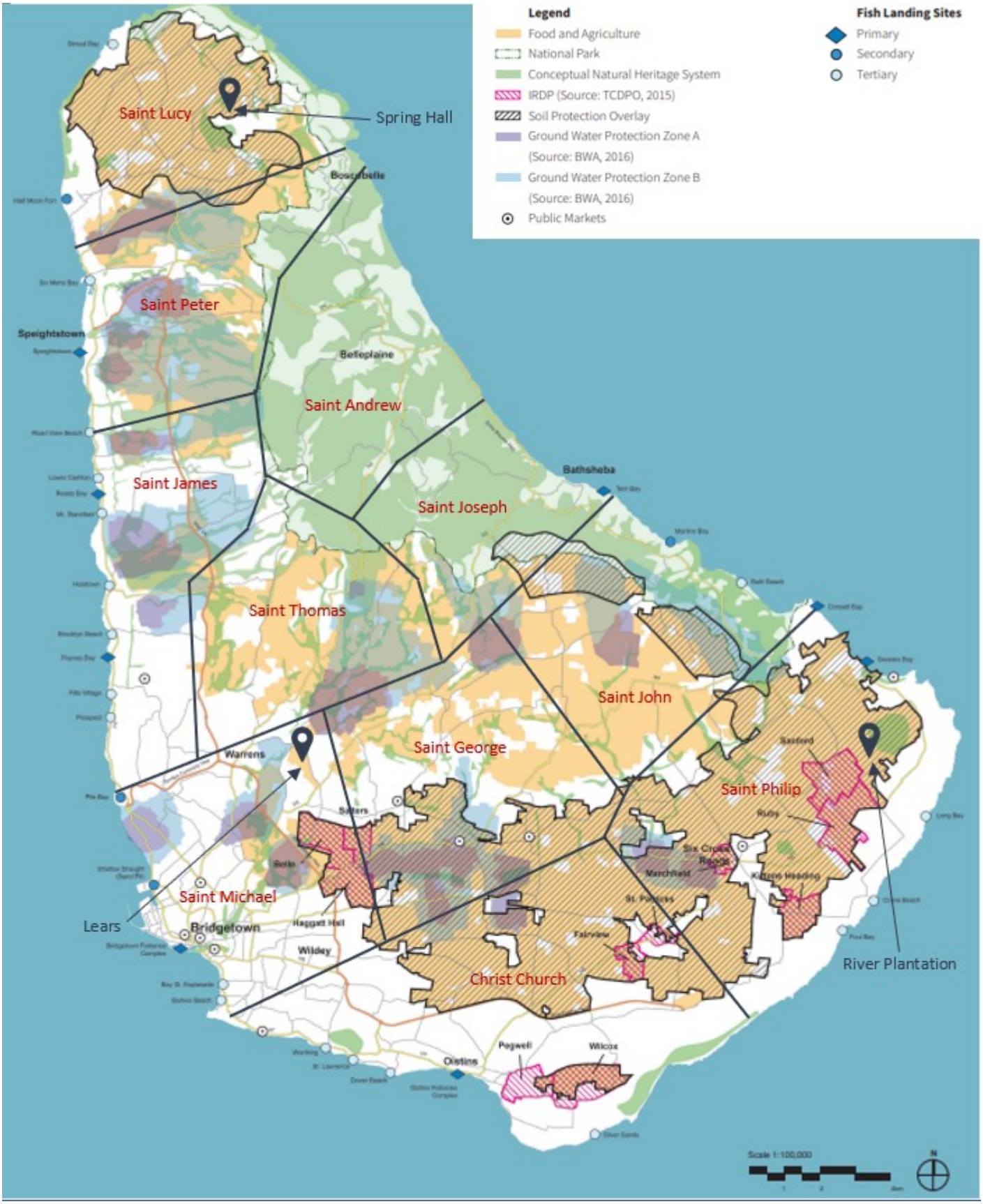
ANNEX C: PROJECT LOCATION

Please provide geo-referenced information and map where the project interventions will take place

With demonstration sites showcasing soilless cultivation and aquaculture systems across the island, the proposed project will be nation-wide in scope. However, activities centered on climate-resilient practices and technologies for traditional open field production will be implemented on holdings in selected productive landscapes. During the consultative process, the areas described in the below table were preliminarily identified. They constitute sample project locations and will have to be studied in more detail at the project preparation stage. The map illustrates that, apart from these areas, farming is also practiced on a larger scale in Christ Church, Saint John and Saint Thomas.

Location	Lat	Lon	Details

River Plantation, St Philip	13.14	-59.44	- Approximately 500 acres (about 202 ha) of land - Under managed irrigation through Browne's Pond Catchment.
Spring Hall, St Lucy	13.30	-59.60	- Approximately 400 acres (about 162 ha) of land, - About 20-30 farmers - As part of the Spring Hall Land Lease Programme, BADMC provides access to irrigation through two wells. - High potential for expansion of farming, many longstanding and new farmers
St George	13.14	-59.54	- Many small farmers, up to 2 acres each - High diversity of farming operations - Farmers organized within St George Farmers Marketing Cooperative Society - Expansion of farming difficult due to residential areas
Lears, St Michael	13.14	-59.58	- Approximately 7 acres of land - Micro-farming under Lears Urban Land Lease and Food Security Programme



Adapted from: Barbados Physical Development Plan (Amended). August 2017. Appendix A. National Maps. LINK

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title

Barbados E and S checklist2

FAO Risk Certification 744407

ANNEX E: RIO MARKERS

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
Significant Objective 1	Principal Objective 2	No Contribution 0	Significant Objective 1

ANNEX F: TAXONOMY WORKSHEET

Level 1	Level 2	Level 3	Level 4
Influencing Models	Strengthen institutional capacity/decision making		
Stakeholders	Local communities	Civil society	
Capacity, Knowledge and Research	Knowledge generation and exchange		
Gender Equality	Gender mainstreaming		
Focal Area/Theme	Climate change		