



ADAPTATION FUND

**PROGRAMME ON INNOVATION:
LARGE GRANTS PROJECTS**

**REQUEST FOR PROJECT FUNDING FROM THE
ADAPTATION FUND**

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project must be fully prepared when the request is submitted.

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The Adaptation Fund Board Secretariat
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ADAPTATION FUND

PRE-CONCEPT FOR A REGIONAL INNOVATION PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Climate Resilient Agriculture Programme: Strengthening Adaptation and Productivity for Sustainable Growth
Countries:	Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines
Thematic Focal Area:	Food security
Type of Implementing Entity:	Regional
Implementing Entity:	Caribbean Development Bank
Executing Entities:	Food and Agriculture Organization of the United Nations – Sub-regional Office for the Organisation of Eastern Caribbean States, in collaboration with Ministries of Agriculture in Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines (National)
Amount of Financing Requested:	USD13,999,520

PROJECT/PROGRAMME BACKGROUND AND CONTEXT

1.1 The Caribbean is on the forefront of the battle against climate change and variability, experiencing the full force of its impacts. Extreme weather events, droughts, floods, rising sea surface temperature, ocean acidification, and sea level rise are just a few examples of the deleterious effects already being felt. Despite the collective efforts of the Region, it is unlikely that the current trajectory of climate change will be significantly altered through the implementation of mitigation measures. Consequently, the Region must focus on adaptation and resilience.

1.2 The impact of climate change on the Caribbean is a complex and multi-dimensional challenge that encompasses economic, social, and environmental factors. The increasing frequency and intensity of climate-related hazards across the region have led to prolonged recovery periods, as evidenced by the experiences of Dominica and Antigua and Barbuda in 2017 after Hurricanes Maria and Irma. Given these circumstances, enhancing multi-sectoral climate change adaptation and resilience becomes paramount.

1.3 Agriculture sector output is directly dependent on climate conditions hence the vulnerability of this sector to climate change is of particular concern. Climate change exerts mounting pressure on the Caribbean's food production capacity, undermining the region's food and nutrition security. A study on the Status of Disaster Risk Management for Floods, Hurricanes and Drought in the Agriculture Sector in the Caribbean notes that the regional agriculture sector continues to be severely impacted by the frequent occurrences of natural disasters, which are projected to increase in frequency and magnitude under climate change. In light of this, the Caribbean Development Bank (CDB) is seeking funding to enhance climate resilience within the agriculture sector of three islands: Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines. This regional initiative will prioritise specific sites identified as highly vulnerable to the adverse impacts of climate change.

STATUS OF THE AGRICULTURE SECTOR

Antigua and Barbuda

1.4 Unlike the other income generating sectors of its economy, agriculture has been affected by a steady decline in terms of its contribution to GDP. As at 2019 the sector contributed approximately 2% of the national GDP with much of the overall contribution owing to the fisheries sub-sector, which also makes a substantial contribution to the sector's export earnings. It was noted that the agricultural sector remains largely underdeveloped accompanied by low capital inputs with minimal attention being placed on sustainable agricultural practices.

1.5 The Food and Agriculture Organization (FAO) of the United Nations estimated an area of 9,000 hectares for agricultural production in 2019 - constituting an estimated 20.5% of the island's total land area. Contribution of domestic agriculture inclusive of fisheries towards the nation's Gross Domestic Product (GDP) has fluctuated, albeit trending upwards. The contribution of the agriculture sector, in real terms, towards GDP increased from a low of 1.47% in 2001 to a high of 2.29% in 2011. This reflected overall increases in sub-sectors; crops (21.4%), livestock (18.8%) and fisheries (118.5%). It is also estimated that agriculture provides a source of livelihood, employment and home-based income for an estimated 10,700 persons, inclusive, of 3,500 crop and livestock farmers. The Food Security policy accredits this growth within that time period to the strategic approach by the Government of Antigua and Barbuda to boost the contribution of the agricultural sector towards economic development via focusing on selected priority commodities, policies and programmes aimed at improving output and productivity.

1.6 While agriculture no longer contributes significantly to the country's GDP due to the decline in large scale sugar production, molasses and rum, some agriculture production (vegetables, food crops, vine fruits, tree fruits and livestock production) still occurs. However, the sector is constrained due to inadequate water availability, particularly during severe droughts. With an increase in consumption patterns and food demands due to population growth, future water demands will also increase. The continued development of training programmes in improved farming practices to include water conservation measures and provide incentives to farmers who incorporate these practices on their farms was identified as a short-term adaptation need for the water sector. Also, in the lower watershed areas, food crop and livestock production are carried out, often in close proximity to surface reservoirs or groundwater supplies. Concerns have been raised about the possibility of pesticide contamination of water supplies or leaching out into the coastal zone in times of heavy runoff. Additionally, wells become unusable during the dry season because of saltwater intrusion, an impact which will be exacerbated by climate change. Overgrazing of pastures and upper watershed areas by livestock has led to the over-exposure of topsoil, which results in erosion and downstream sedimentation. Such occurrences have caused dams, streams, and ponds to lose effective storage capacity and have thus increased the likelihood of downstream flooding and pollution.

Saint Kitts and Nevis

1.7 Historically, the agriculture sector in Saint Kitts and Nevis (SKN) was once synonymous with sugar (Saint Kitts) and cotton (Nevis), however the monoculture sugar industry was closed in 2005. The agricultural sector is now primarily inclusive of crops, fisheries, forestry and livestock. Although the sector contributed toward only 1% of GDP as of 2019, it is a major supply of food for SKN. The Saint Kitts 2013-2016 Agriculture Development Strategy (ADS), notes that despite its relatively small share, primary agriculture has exhibited the capacity to generate high rates of growth within the economy. This reality was noted for period (1999 to 2008), where even amid economic recessions for period 2001 to 2002 and slow growth for period 2007 to 2008, the growth in primary agriculture was substantially higher than the national growth. However, despite its relatively small size and difficulties in the leading crop industry, agriculture still remains a significant component of the Kittitian economy, generating

26.2% of merchandise exports and employing just over 2% of the labour force as of 2016. In 2016¹, it was estimated that 527 persons (2.5% of the working population), 19% female and 81% male, were involved in agriculture. About 60 square kilometres (km²) which represents 23% of the total land area is used for agricultural purposes in SKN.

1.8 The main agricultural export crops include peanuts, sea island cotton, and coconuts. Crops grown for domestic consumption include sweet potatoes, rice, bananas, onions, tomatoes, cabbages, carrots, and breadfruit. SKN is also regarded as a net food importer; with food import in 2022 being USD84 million (mn) compared to USD31 mn in 2002, thereby showcasing an exponential increase in value of 174% in food importation over the 20-year period. Agricultural exports, estimated at EC\$20.8 mn (USD7.7 mn) in 2022, comprised of a limited number of commodities but is dominated by fisheries products. It is important to note that even amid a sharp 84% fall in 2005 from 2004, due to closure in the sugar industry, trade performance gradually improved thereafter. In this regard, the agriculture strategy notes that domestic agriculture can contribute to the economy via reducing the food import bill and export growth. It is important to note that food imports account for over 60% of Saint Kitts and Nevis food supplies with increases experienced in all major categories, making the nation very vulnerable to rising food prices. It was reported that the country imports around USD50 mn worth of agricultural and food products annually which constitute 17% of the total merchandise imports.

1.9 Additionally, the agricultural trade balance has been increasingly unfavourable for SKN with an average trade deficit for period 2018 to 2022 estimated at EC\$197.2 mn with sharp increases in recent times due to rising food prices stemming from COVID-19 related supply chain disruptions and the impact of the Russia-Ukraine war on commodity markets. Annual earnings for agricultural exports were averaged at EC\$14.6 mn, contributing only 7% to the food import bill and to a growing agricultural trade deficit. In this regard, it would prove beneficial for SKN to enhance the climate-resilience of their food systems, as a means of attempting to continue to meet local food demands amid a changing physical climate and to increase the agriculture's sector contribution to the economy and reduce the deficits. The closure of the sugar industry in SKN resulted in an impetus for the Government to increase non-sugar agricultural production. Generally, in Saint Kitts access to irrigation water is very limited, because vegetable production is carried out on the lower hillslopes. The Water Service Department does not cater for irrigated agriculture but has accommodated the requests of some livestock owners. Because of the relatively high consumption and water scarcity situation, requests from crop farmers are rarely given consideration.

1.10 The Department of Agriculture, SKN, considers the lack of water for supplementary irrigation in the dry season the major obstacle to achieving one of its primary goals: year-round production of selected vegetables. Constraints on water and irrigation development include:

- high cost of exploratory drilling;
- high cost of irrigation development per unit area;
- difference in altitude between farms and the groundwater aquifers near sea level;
- small catchment areas, which limit the maximum size of reservoirs; and
- inaccessibility of mountain springs.

1.11 Climate projections suggest that by the second quarter of the century, conditions may be too dry to support rain-fed agriculture, and yields would likely fall below economically viable levels. Consequently, sugarcane cultivation would only be possible with irrigation, for which the same model suggests there would be inadequate water. The projections also suggest that future prospects for livestock, fruit and vegetable production would be grim. In Nevis, rising sea levels are likely to lead to salinisation of agricultural soils in lowland areas, and in both islands salinisation of coastal aquifers, which is already being observed, will adversely affect water availability for agriculture.

¹ Employment by Sector and Sex, 2013 and 2016 - Department of Statistics, Ministry of Sustainable Development (stats.gov.kn)

Saint Vincent and the Grenadines

1.12 Traditionally, the economy of St. Vincent and the Grenadines (SVG) depends largely on agriculture through its contribution to GDP, employment and foreign exchange. Family farms constitute more than 90% of the approximately 7,000 holdings, which are characterised by small farm size (<5 acres), low mechanisation and limited infrastructural investment and technology use (IICA, 2014). The contribution of agriculture to GDP stood at 8.2% in 2019, 8.7% in 2020 and subsequently fell to 6.2% in 2021 and 5.5% in 2022.

1.13 Prior to the removal of preferential trade arrangements, the country along with other Organisation of Eastern Caribbean States members was supported by a thriving banana industry. The introduction of trade liberalisation, together with increased occurrences of natural disasters and reducing developmental attention have significantly reduced the sector's ability to contribute to economic growth and development. The country experienced multiple volcanic eruptions in 2021 which forced the evacuation of over 30,000 people, many of them farmers who lived and work on lands adjoining the volcano. The volcanic eruption resulted in significant crop losses to the extent that the government declared a food security emergency. A Post-disaster Needs Assessment of the volcanic eruption estimates that over 20,000 persons (around 20.0% of the population) were temporarily displaced, with damage and loss to infrastructure, agriculture, and related sectors from significant ashfall and superheated mud flows, of approximately USD235 mn (around 26.0% of GDP). Damage and loss for Agriculture, Forestry and Fisheries stood at USD85.24 mn (or 36.3% of total).

1.14 Agriculture remains an important sector for rural employment of approximately 26% of the country labour force and contributing to economic and social development. Banana remains the dominant economic crop, but there has been an increase in the cultivation of root crops including cassava, eddoes, dasheen, yam and sweet potato. Caribbean Agricultural Research and Development Institute noted that the Government has been implementing a series of structural reforms to promote greater investment in agriculture through restructuring the banana industry and agricultural diversification with a series of fiscal incentives and farm support services. Other key agricultural products are coconuts, arrowroot, spices as well as small holdings of cattle, pigs, sheep and goats. Efforts at developing the sector are conditioned by the vulnerability to climate variability and climate change.

GEOGRAPHY OF PARTICIPATING COUNTRIES

1.15 **Antigua and Barbuda** is a twin island state located at 17°10' north, 61°55' west (Antigua) and 17°35' north, 61°48' west (Barbuda). Antigua is the larger of the two islands at 280 km², while Barbuda, which is 40 km north of Antigua, has a land area of 176 km²; and together they have an exclusive economic zone of 110,071 km². Both islands are low-lying with 70% of the land in Antigua being less than 30 metres (m) above mean sea level and most of Barbuda only 3 m above mean sea level. Antigua has three topographic zones. The first is the mountainous southwest volcanic region, comprised of hard igneous rocks in the uplands and sedimentary material in associated valleys. The second zone is relatively flat central plains, consisting of heavy clays, not readily drained. The third zone is described as the rolling limestone hills and valleys of the North and East. Barbuda is relatively flat with some low-lying hills rising to just below 40 m in the Highlands area and is dominated by coralline limestone rocks. Barbuda can also be divided into three topographic zones, however, less marked than Antigua. The first zone consists of highland limestone areas – hard limestone riddled with caverns and sink holes. The second zone is the Codrington limestone region, comprising of sandy and fossiliferous sediments, less crystalline than the Highland limestone. The third zone is the Palmetto Point Series that overlies the Highlands and Codrington formations in coastal areas and is composed of beach sands and ridges with shelly horizons².

² Government of Antigua and Barbuda (2015).

1.16 The twin island Federation of **SKN** is a state composed of two islands in the northern region of the Lesser Antilles. St. Kitts is located at 17°15 north and 62°45 west, whereas Nevis is located 3 km to the southeast at 17°1 north and 62°35 west. St. Kitts, the larger island, is 37 km at its greatest length, with an area of 176.8 km², whereas Nevis has an area of 93.6 km². The islands are the summits of a submerged mountain range, which forms the eastern boundary of the Caribbean Tectonic Plate³. The physical landscape of St. Kitts is characterised by three volcanic centres and ranges. The first is the central northwest range, dominated by Mt. Liamuiga, which rises with a pronounced crater to 1,156 m. The middle range is dominated by Verchild's mountain at 975 m but otherwise consists of a number of irregular peaks. Nevis is volcanically active with fumaroles and hot springs⁴. The highest point in Nevis is the central Nevis peak at 985 m, while Windy Hill, Saddle Hill and Butler's Mountain at 309, 381 and 478 m respectively, define a north-northwest to south-southeast spine across the island⁵. The land in Nevis is typically flat near the coast, with sandy beaches, freshwater lagoons, rocky shores and cliffs.

1.17 **St. Vincent and the Grenadines** is a multi-island nation comprised of 32 islets and cays each with its own characteristics, in the Lesser Antilles of the south-eastern Caribbean. St. Vincent, located at 13°15 north and 61°12 west, is the largest of the islands with a size of 344.5 km². The Grenadines extend 1.6 km to the south-west of the mainland and covers a land area of ~44 km², however, only eight of the islands are inhabited. St. Vincent is of volcanic origin and mountainous in nature. The central mountain range which stretches from north to south along the entire length of the island is considered the main topological feature. The northernmost part of the range is home to the island's active volcano, La Soufriere, which is the highest point on the island ~1,233.8 m above mean sea level. Conversely, the southernmost part of the range consists of elevations from Richmond Peak at 1,073.8m to Mt. St. Andrew at 735.5m. The range is characterised by lateral spurs which radiate outwardly to the east and west, giving rise to deep narrow stream filled valleys that drain unto predominantly black sand beaches. The Grenadines are also volcanic in origin; however, they are low-lying with no point higher than 304.8m. In addition, there are coral formations on these islands that give rise to white or beige sand beaches. The low-lying nature of the islands makes them vulnerable to the expected effects of sea level rise.

SOCIO-ECONOMIC CONTEXT

1.18 **Antigua and Barbuda's** population at 100,722. Currently, the tourism sector contributes approximately 48% of the GDP and has formed linkages with other ancillary sectors like transportation, wholesale/retail, agriculture and communications⁶. However, Antigua's Updated Nationally Determined Contributions (NDC) now places the tourism industry's contribution at 80% citing its employment rate at 70% and accounting for 85% of foreign exchange earnings. The country's economy is therefore characterised as being natural resource dependent, with dependence on low-lying coastal zones and favourable climate conditions which drive the tourism industry.

1.19 Approximately 18% of the population falls below the national poverty line, with 3.7% being indigent (food poor) and 10% vulnerable to poverty in the event of significant socio-economic shocks or natural hazards. When consideration is given to the proportion of the population that is at risk of falling into poverty on the onset of a shock to the economy, the percentage increases from 18% to 28%. Antigua and Barbuda is also committed to achieving SDG:5 Gender Equality via the promotion of low carbon development where both genders (men and women) contribute to climate change mitigation and adaption and their contributions are recognized and valued, and reduction in existing gender inequalities and opportunities for effective women empowerment are promoted.

³ Government of St. Kitts and Nevis (2001).

⁴ Global Facility for Disaster Reduction and Recovery (2010).

⁵ Government of St. Kitts and Nevis (2007).

⁶ Antigua and Barbuda – Statistics Division, Ministry of Finance and Corporate Governance.

1.20 Saint Kitts and Nevis has a population of approximately 47,606 (2021)⁷. The country has a GDP per capita of \$US18,082.61(2021). Therefore, it is characterised as a high-income country. Unemployment in SVG, is among the lowest in the Caribbean, based on 2016 labour market data from its Department of Statistics⁸, when only 2.0% of the population, were unemployed at that time. The leading employment areas on the island include Public Administration (15.8%); Wholesale and Retail (11.9%), Education (11.2%), Accommodation and Food Service (10.3%) and Construction (9.7%).

1.21 Saint Vincent and the Grenadines is a small island developing state with an estimated population of 110,872 (2022) and a GDP per capita of US\$8,555 (2022). Females account for 48.7% of the total population while males account for the remaining 51.3%. The urban population, now at 50.5%, continues to grow as people migrate to the urban areas predominantly in the south of the country. The country has endeavoured to manage population growth within the confines of limited space and resources to ensure sustainability and prosperity to citizens.

1.22 Saint Vincent and the Grenadines is an upper-middle income country. Agriculture, light manufacturing, and tourism are the main economic drivers that have helped sustain development progress, aided by targeted public spending in health, education, and infrastructure development. The majority of the work force is employed in agriculture, construction, and tourism and related services, with a continual shift from agriculture due to loss of preferential trading arrangements and external market contractions. Positive although fluctuating growth in real GDP has been reported between 2015-2019, however, COVID-19 led to a contraction in real GDP which fell by 3.7% in 2020. In addition to the adverse impacts of COVID-19, SVG suffered the effects of the La Soufrière volcano, which erupted in April 2021 and compounded the already difficult socioeconomic challenges facing the country. The country recorded marginal growth of 0.8% in 2021. The economy is likely to benefit from a gradual recovery in tourism, rising agriculture and fishery exports, and strong infrastructure development including hotel construction and port modernisation over the medium term. Reflecting fiscal pressures from the port modernisation project as well as post-volcanic eruption reconstruction, public debt is expected to remain elevated in near-term. Total public debt to GDP stood at to 88.0% in 2022 relative to 89.2% at the end of 2021. The Government has taken a policy direction to reduce poverty and actioned programmes and activities which have been moderately successful. However, the vulnerability levels remain a cause of concern. In 2008, the vulnerability level stood at 48.2%, with the rural and banana farming population identified as being at high risk and needing particular poverty reduction strategies.

CLIMATE CHANGE OBSERVATIONS

Regional Context

1.23 Due to their size and location, Caribbean countries are particularly vulnerable to the impacts of climate change. It is an existential threat to economies highly dependent on at risk sectors such as agriculture, fisheries and tourism. Caribbean countries will be increasingly affected by rising sea levels and changes in rain patterns. According to the Inter-Governmental Panel on Climate Change Sixth Assessment Report (IPCC AR6 Report (2021), the Region can expect economic decline and livelihood failures at global temperatures above 1.5°C. There is already evidence (IPCC) showing average temperatures in the region to have increased by 0.1°C to 0.2°C per decade over the past three decades. Rainfall patterns have shifted with the number of consecutive dry days expected to increase. Additionally, sea level rise has occurred at a rate of about two to four centimeters per decade over the past thirty-three years, a trend that presents risks to freshwater resources and to populations dependent on agriculture and tourism.

⁷ World Development Indicator.

⁸ Employment by Sector and Sex, 2013 and 2016 - Department of Statistics, Ministry of Sustainable Development (stats.gov.kn).

Country Observations

1.24 Based on observational analyses over the period 1960 to 2006, **Antigua and Barbuda** has been experiencing changes in both atmospheric temperature and rainfall. For temperature, the country has recorded changes of 0.1°C, 0.11°C, 0.16°C and 0.17°C per decade during the December, January, February (DJF), March, April, May (MAM), June, July, August (JJA) and September, October November (SON)⁹ seasons respectively. For rainfall, changes of +2.9, -5.9, -4.2 and -3.6 mm per decade have been recorded¹⁰. Climate variability and trends in Antigua and Barbuda over the period 1971 to 2020 are shown in Figure 2a and 2b. Atmospheric temperature and rainfall patterns in **St. Kitts and Nevis**¹¹. Historical atmospheric temperatures have shown substantial increases in the number of warm days and nights during the period 1980-2011. Both the maximum number of consecutive dry days and extreme rainfall events have been increasing. Climate variability and trends in St. Kitts and Nevis over the period 1971 to 2020 are shown in Figure 3a and 3b. For **St. Vincent and the Grenadines**, rainfall indices have shown an increase in the number of heavy rainfall events which occur in a year. This is reflected in an increase in the number of days with rainfall between 10-20 millimetres (m) (R10) and the number of consecutive wet days. This trend is also reflected in the increase in some rainfall intensity indices, including daily intensity, maximum consecutive five-day rainfall and maximum one-day rainfall. However, extremely wet days - R99 (days with rainfall occurring at levels higher than the 99th percentile) occur with less frequency as the historical record progresses. Additionally, temperature indices indicate that warm days and nights (TX90) have increased over the last two decades, and cool days and nights (TX10) have decreased¹². In the Second National Communication, agriculture was identified as one of five key sectors most vulnerable to climate change. Climate variability and trends in St. Vincent and the Grenadines over the period 1971 to 2020 are shown in Figure 4(a) and (b).

Projections

Atmospheric Temperature and Rainfall

1.25 Projected changes in the distribution of mean temperature for Antigua and Barbuda, SKN, and SVG are presented in Figures 2, 3 and 4 respectively. For Antigua and Barbuda shown in Figure 2b, a rightward shift towards progressively higher average temperatures occurring at a greater frequency is projected by the end of the century. The narrowing of the bell shape and higher peak from the 2060s onwards, indicate a decrease in the temperature range and an increased frequency of hotter days. For St. Kitts and Nevis shown in Figure 3b, a similar pattern of increasing temperature is projected. For St. Vincent and the Grenadines shown in Figure 4b, higher (~0.5°C) increases are projected in comparison to the other two countries.

1.26 Projected changes in the distribution of rainfall for Antigua and Barbuda, SKN, and SVG are presented in Figures 2, 3 and 4 respectively. For Antigua and Barbuda shown in Figure 2d, increased rainfall at a lower frequency is projected during the period 2020 to 2039, in comparison to the baseline period. From the 2040's, a leftward shift towards drier conditions is projected by the end of the century, at varying frequency. A similar pattern of changes in rainfall is projected for SKN, shown in Figure 3d. For SVG, a progressive shift towards drier conditions is projected by the end of the century, in comparison to the baseline period, as shown in Figure 4d.

⁹ DJF –; MAM; JJA; SON.

¹⁰ CARIBSAVE (2012).

¹¹ Government of St. Kitts and Nevis (2015).

¹² Government of St. Vincent and the Grenadines (2015).

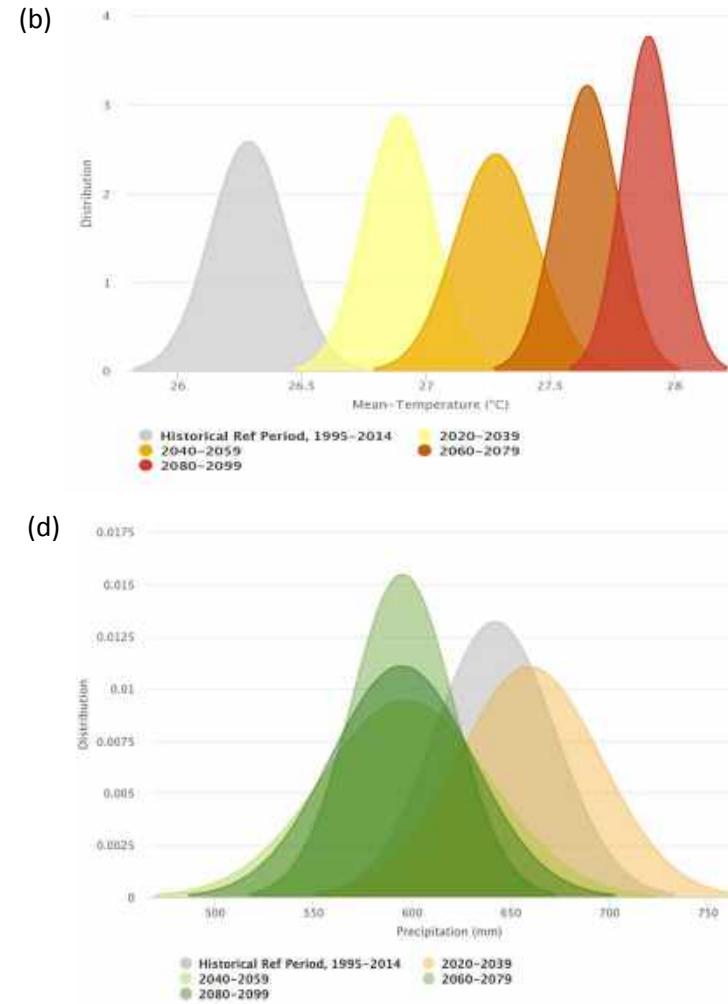
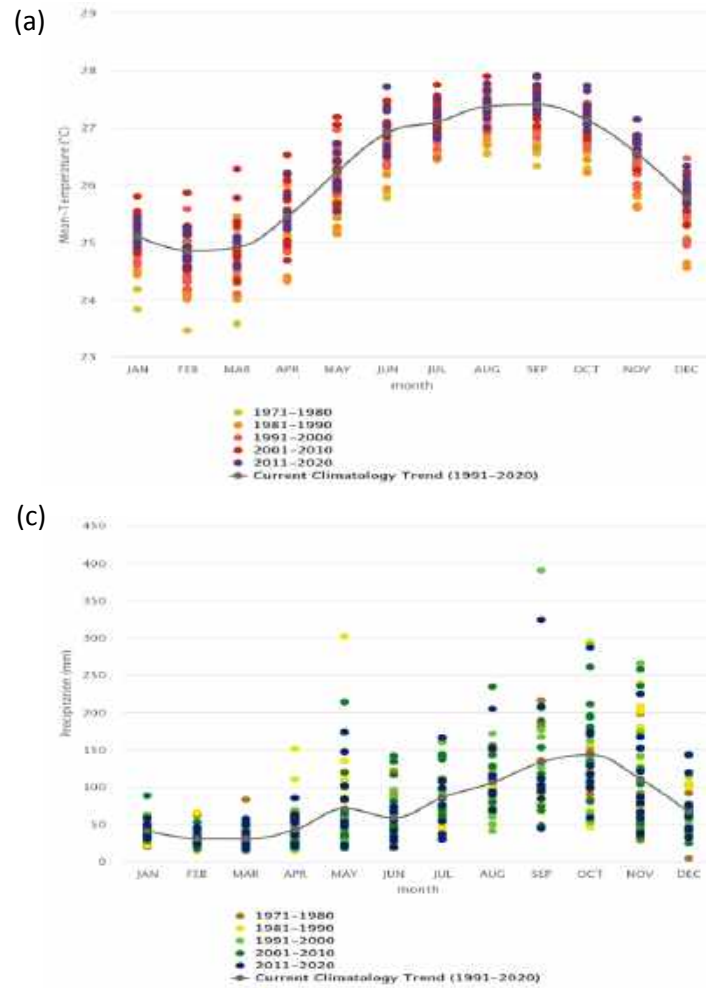


Figure 2 | Recent and Projected Climate for Antigua and Barbuda. (a) Monthly climatologies of mean temperature over the period 1971 to 2020; (b) Projected changes in precipitation distribution over the period 2020 to 2099; (c) Monthly climatologies of precipitation over the period 1971 to 2020; (d) Projected changes in precipitation distribution over the period 2020-2099. Projected climate anomalies have been calculated with respect to the historical reference period 1995-2014 using a multi-model ensemble under SSP2-4.5.

Source: *The Climate Change Knowledge Portal*

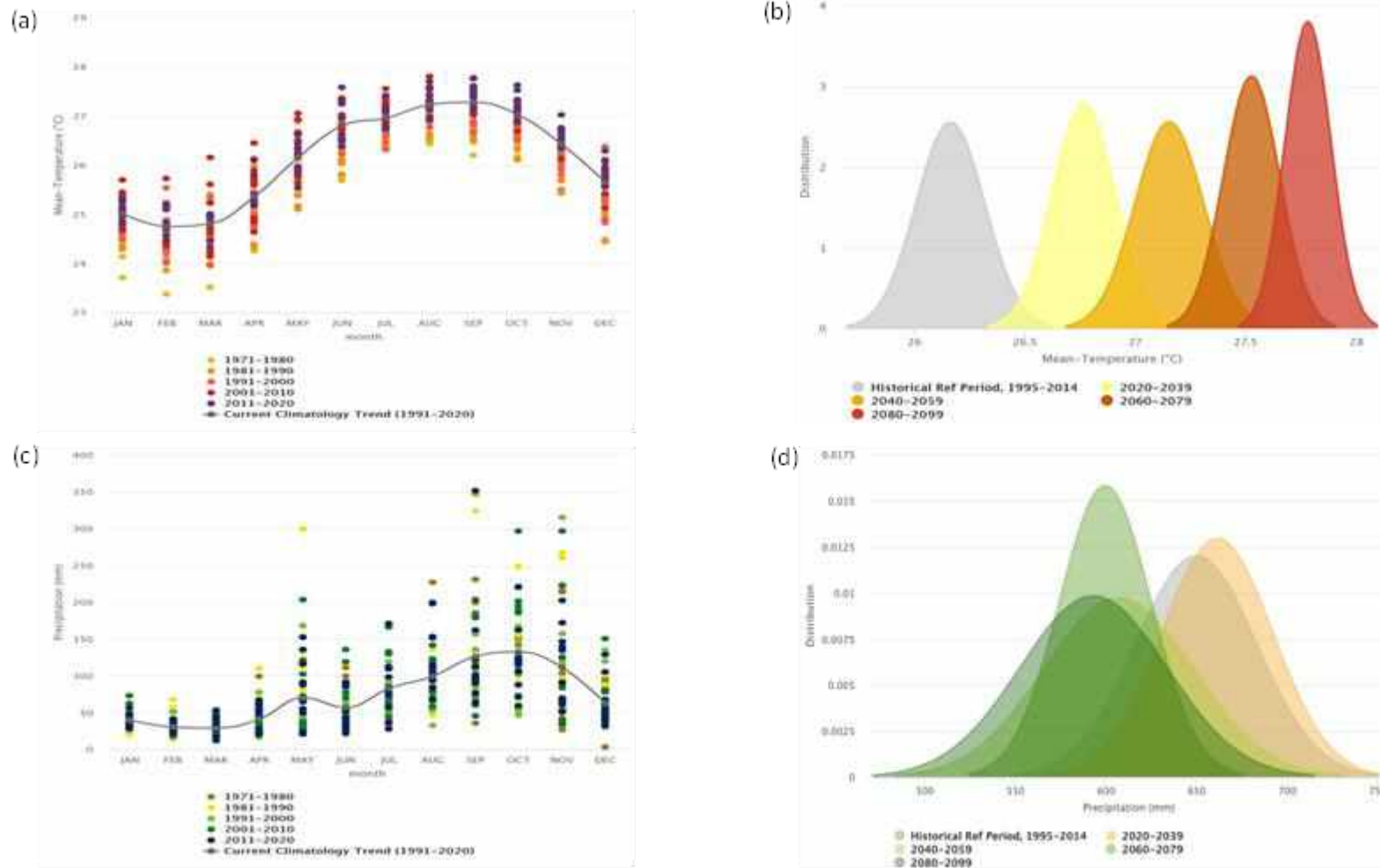


Figure 3 | Recent and Projected Climate for St. Kitts and Nevis. (a) Monthly climatologies of mean temperature over the period 1971 to 2020, (b) Projected changes in precipitation distribution over the period 2020 to 2099; (c) Monthly climatologies of precipitation over the period 1971 to 2020; (d) Projected changes in precipitation distribution over the period 2020-2099. Projected climate anomalies have been calculated with respect to the historical reference period 1995-2014 using a multi-model ensemble under SSP2-4.5.

Source: *The Climate Change Knowledge Portal*

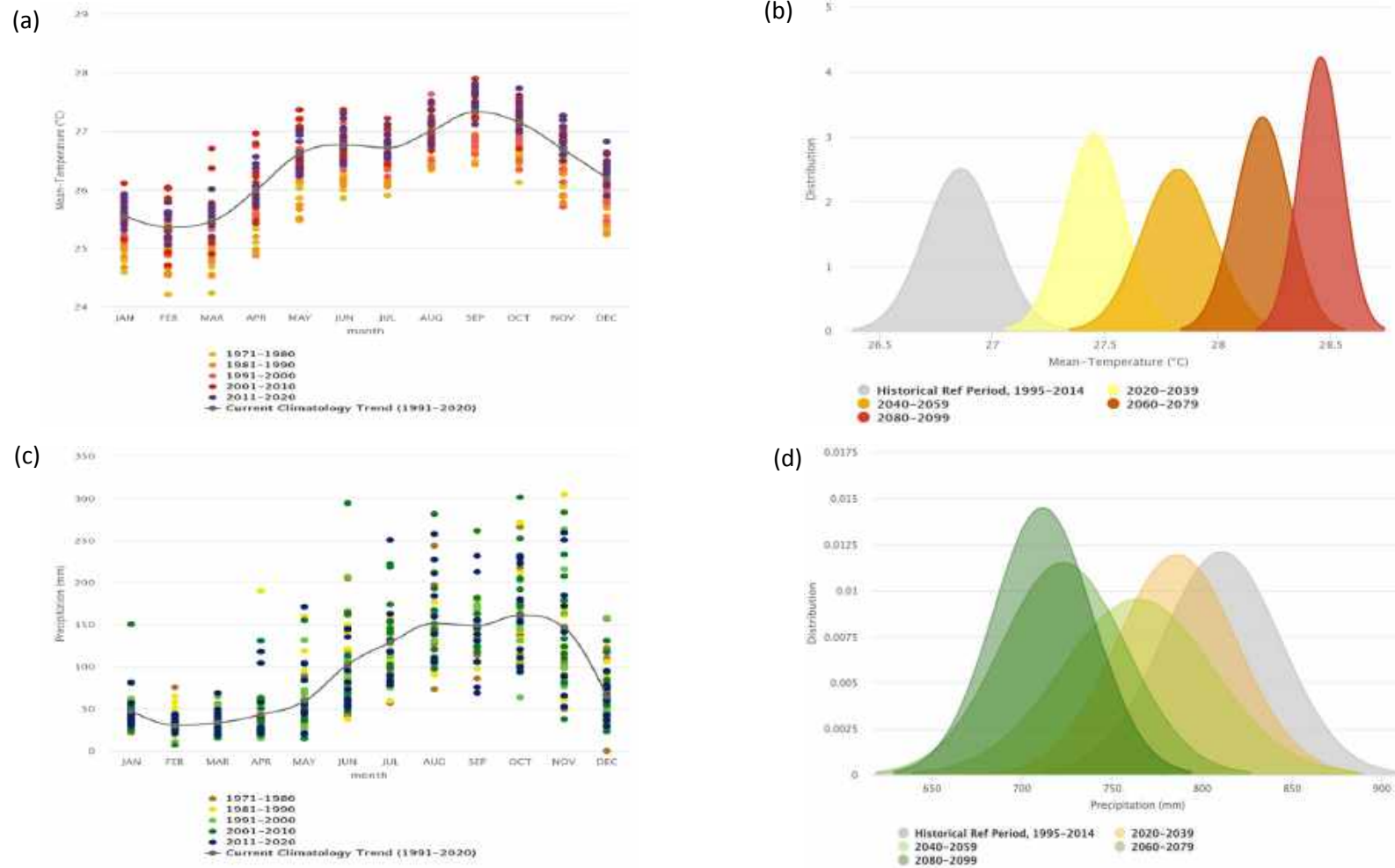


Figure 4 | Recent and Projected Climate for St. Kitts and Nevis. (a) Monthly climatologies of mean temperature over the period 1971 to 2020; (b) Projected changes in precipitation distribution over the period 2020 to 2099; (c) Monthly climatologies of precipitation over the period 1971 to 2020; (d) Projected changes in precipitation distribution over the period 2020-2099. Projected climate anomalies have been calculated with respect to the historical reference period 1995-2014 using a multi-model ensemble under SSP2-4.5.

Source: *The Climate Change Knowledge Portal*

CLIMATE CHANGE IMPACTS ON AGRICULTURE

Overview

1.27 The Caribbean has experienced marked increases in temperature in the few decades (1986-2010), with heavier daily rainfall and an increase in frequency and intensity of hurricanes (Stephenson et al. 2014; CSGM 2017). Droughts have also been very costly to the agriculture sector, especially given the overreliance on rain-fed agriculture (Beckford and Barker 2007; Gamble et al. 2010; Farrell et al. 2010). Sea level rise also poses a threat to the availability of fresh water, which is a vital resource for the sector.

Antigua and Barbuda

1.28 The country is exposed economically, environmentally, and socially to projected climate change impacts, which will result in a greater intensity of hurricanes, more frequent droughts, high temperatures and sea-level rise¹³. Downscaled climate projections to inform detailed risk modelling for Antigua and Barbuda indicate that Antigua stands to lose approximately 26.6 to 35.3 km² of low-lying coastal land to sea level rise by 2080. The estimated value of assets on this land is USD196 to USD 293 mn. Similarly, Barbuda is projected to lose between 24.2 and 29.6 km² of land, as well as assets valued at between USD68.9 and USD123.9 mn¹⁴. Given the relatively small size of Antigua and Barbuda, two of the driest islands in the Caribbean region, drought¹⁵ effects are felt island-wide and are a recurrent feature of the climate¹⁶. Low levels of rainfall, combined with porous limestone geology, make the islands vulnerable to hydrological drought¹⁷.

1.29 Antigua and Barbuda have a long history of droughts. Historical records indicate considerable overall decreases in rainfall, with further projected reductions under climate change. In addition, evaporation rates are high and therefore in recent times the impact of drought has become more severe. The agriculture sector is highly vulnerable to climate-related hazards and due to drought conditions, it has suffered extensive crop losses. For example, in 2010 onion and tomato crops decreased by 25 and 30% respectively due to water-stressed conditions¹⁸. In the past, during periods of severe drought, the nation depleted surface and groundwater reservoirs, has had to resort to installation of expensive desalination plants and importing water from neighbouring islands.

1.30 The agriculture sector is unable to afford water provision through the use of desalination plants, which is costly. Ongoing drought conditions have significantly impacted the country's economy, with particular reference to the agriculture sector. The agriculture sector is also adversely affected by flood hazards. Flooding is mostly due to short duration, high intensity rainfall and has been responsible for significant social and economic loss. For example, due the passage of Hurricane Earl, an estimated 197.6 mm of rainfall fell within a 24-hour period. This resulted in flooding, as well as damage to road networks in rural areas and crops¹⁹. In addition, the agriculture sector has suffered from continued indiscriminate cutting, setting of fires and uncontrolled grazing, which has contributed to severe degradation, accelerated erosion and reduced productivity of the land²⁰, which is exacerbated by climate

¹³ Government of Antigua and Barbuda (2020c).

¹⁴ Department of Environment (2020a).

¹⁵ According to the U.S. National Drought Mitigation Center, there are three main types/definitions of drought: *meteorological*, *agricultural* and *hydrological*.

¹⁶ Government of Antigua and Barbuda (2015).

¹⁷ CARIBSAVE (2014).

¹⁸ Status of Disaster Risk Management: Plans for Floods, Hurricanes and Drought in the Agriculture Sector: A Caribbean Perspective (2013).

¹⁹ National Office of Disaster Services (2010).

²⁰ Government of Antigua and Barbuda (2009).

change. Challenges faced by the agriculture sector are both institutional and natural. The main challenges are knowledge dissemination and monitoring of sustainable farm practices to avoid indiscriminate land clearing. In addition, wells become unstable during the dry season due to saltwater intrusion²¹, which may be further exacerbated by sea level rise associated with climate change.

St. Kitts and Nevis

1.31 Observed changes in the climate in St. Kitts and Nevis have led to increased drought with negative effects on agriculture, decreased water security and flash flooding. The Federation has suffered considerable damage from storm and hurricane events in the recent past. Since 1960, 16 such events have passed within 100 km of the islands, causing loss of life, as well as extensive economic and social disruption. In St. Kitts and Nevis, the greatest risk of flooding and landslides follows periods of intense rainfall, which may be further exacerbated under climate change. Coastal and marine resources are projected to face significant negative effects as global temperatures rise. Sea level rise poses a significant risk to the agriculture sector for St. Kitts and Nevis, as it can result in saline intrusion. In the updated NDC, the Government highlighted the need to implement adaptation measures to reduce the risks of climate change and address loss and damage, which is already being experienced and is projected to increase²².

St. Vincent and the Grenadines

1.32 In St. Vincent and the Grenadines agricultural activities are based on the production of vegetables, tree and root crops, as well as animals on small plots of land. Deep soil tilling, the farming technique used with these crops often on slopes over 30°, leads to frequent landslides during periods of intense rainfall²³. The Vincentian agriculture system is vulnerable to economic, social, and environmental factors, including climate change, which is considered the most critical due to its intimate relationship and direct dependency on climate. Shifts in the timing and length of the wet-dry season due to climate change have direct effects on the timing of the planting season, while at the same time affecting crops under production. The high reliance of crop production on the timing of seasons means a prolonged dry season increases dependency on on-farm irrigation systems, which many farms lack and can lead to water stress. Conversely, intense rainfall events lead to waterlogged conditions and soil nutrient depletion, with adverse effects on optimum productivity. In addition, these hazards can trigger landslides, particularly at the onset of the wet season, due to enhanced soil exposure from fires during the dry season.

PROJECT/PROGRAMME OBJECTIVES

1.33 The main objective of this proposed project is to build climate resilience of small-holder farming systems through adoption of climate-responsive innovations for soil and water management, innovative and sustainable financing and improved data management infrastructure. The proposed project will be implemented at specific sites (to be determined during development of the full proposal) in each of the three participating countries. It aims to build resilience of farming systems by addressing four main challenges identified by countries, with the specific objectives outlined below.

- (a) Improved Water Management (WM) (Access, Use Efficiency, Quality and Reuse).
- (b) Enhanced Soil Management (SM) and adaptive production systems (Health, Quality and Resilience).
- (c) Improved Data Management (DM) (Collection, Analysis, Sharing and Transfer).
- (d) Improved Access to Finance and Financial Management (AFFM) (Insurance, Public-Private Partnerships, Improved Financial Security).

²¹ Government of Antigua and Barbuda (2015).

²² Government of St. Kitts and Nevis (2021).

²³ Government of St. Vincent and the Grenadines (2015).

1.34 These objectives are related to the eight outcomes listed under the AF's Strategic Result Framework (SRF)- Table 1. Addressing the challenges will support attainment of the stated outcomes.

Table 1: Alignment with the AF's SRF

AF's SRF Outcomes	WM	SM	DM	AFFM
1. Reduced exposure to climate-related hazards and threats				
2. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses hazards and threats				
3. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level				
4. Increased adaptive capacity within relevant development sector services and infrastructure assets				
5. Increased ecosystem resilience in response to climate change and variability induced stress				
6. Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas				
7. Improved policies and regulations that promote and enforce resilience measures				
8. Support the development and diffusion of innovative adaptation practices, tools, and technologies				

1.35 The project will therefore consist of three (3) components aimed at addressing these shared challenges across the participating countries.

PROJECT/PROGRAMME COMPONENTS AND FINANCING

Table 2: Project Components and Estimated Financing

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Improved agricultural water management.	Output 1.1: Climate-resilient infrastructure and technologies in place to supply water to the farms in a sustainable manner. Output 1.2: Water Use Efficiency (WUE) of prioritised crops increased through Climate-Smart Agriculture (CSA) technology adoption.	Enhanced water use and conservation and increase in agricultural production and productivity.	9,000,000

	<p>Output 1.3: Enhanced capacity of farmers and extensionists to plan, design, install and operate on-farm water management systems.</p> <p>Output 1.4: Enhanced technical and practical capacity for improved water management.</p>		
2. Increasing farm system adaptive capacity through sustainable soil management (SSM) and protected agriculture.	<p>Output 2.1: Soil, crop and climatic data collection and monitoring system installed/upgraded.</p> <p>Output 2.2: Soil/land-based technologies and CSA practices for outdoor and protected agriculture improved.</p> <p>Output 2.3: Improved technical capacity and data management as it relates to SSM and protected agriculture.</p>	Improved soil health and functional climate-resilient production systems with sustainable farming practices.	2,000,000
3. Improving the Financial Stability of Small Farmers and institutional coordination to scale up climate-smart agriculture	<p>Output 3.1 Investment in climate-smart agriculture de-risked and small farmers' access to financial products and services improved.</p> <p>Output 3.2 Improved data management technical capacity and coordination in public sector and financial institutions to scale up climate-smart agriculture.</p>	Increased financial flows and institutional coordination towards climate-smart agriculture.	864,000
4. Project Execution Cost (9.5% of Total Project Cost)			1,127,080
5. Total Project Cost			11,864,000
6. Project Cycle Management Fee charged by the Implementing Entity (8.5% of Total Project Cost)			1,008,440
Amount of Financing Requested			13,999,520

PROJECT DURATION

1.36 The project will be implemented over a period of four (4) years.

PART II: PROJECT/PROGRAMME JUSTIFICATION

Describe the project/programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

2.1 The scope for action will be centred around responding to projected changes in water supply and demand and improving adaptive capacity. The multi-dimensional climate vulnerability and risks presented in the Project Background, highlight the continued need for adaptation strategies to reduce these vulnerabilities, and achieve climate resilience. There is regional consensus to focus on the agricultural sector because of its multifaceted role in combatting climate change and its impacts. The proposed project will also address some of the barriers to climate change adaptation in these three countries. The proposed project components translate the project objectives into concrete outcomes and outputs, which will enable proactive decision-making and support a climate-resilient agricultural system ensuring food security for Antigua and Barbuda, St. Kitts and Nevis and St. Vincent and the Grenadines, beyond the life of this project.

Component 1: Improve agriculture water management

2.2 The growing competition for the use of water places pressure on the amount of water available for agriculture. Climate change is expected to intensify this pressure, particularly in regions where water security is already a concern. Efforts to develop adaptation strategies for agricultural water management can help to prioritise responses to key risks identified. Water management and security are paramount to achieving food security. Reliable access to water poses a major constraint for many farmers, mostly in rain fed areas but also those involved in irrigated agriculture. Agricultural water management includes the management of water used in crop production (both irrigated and rain fed), livestock production and inland fisheries. It also includes soil, land and ecosystem conservation practices, such as drainage and watershed management. Sustainable management of water resources require technologies which enable sustainable land management to reduce periods of water stress and drought which are becoming more important to policy makers due to climate change. Large numbers of farmers invest in small-scale irrigation systems with limited technical knowledge and support, resulting in inefficiencies and wastage. Contrastingly, many others have limited access to water sources with good quality water for irrigation. There is therefore a great need to strengthen national capacity to adopt and disseminate agricultural water management technologies. Current water demands and water management practices, coupled to projected unreliability of rainfall seasonality and overall decreases due to climate change rationalizes the urgent need for addressing water management in adaptation planning. In response to the need for agricultural water management, this project identifies a series of outputs tailored to national-level circumstances. These are outlined in the following sections.

Output 1.1: Climate-resilient infrastructure and technologies in place to supply water to the farms in a sustainable manner

Activity 1.1.1 Installation of and evaluation of NEWT and other smart technologies at selected farms

2.3 Water management is currently constrained by low availability and poor monitoring at the farm level. In response to the needs of the smallholder farmers for increasing water supplies, evaluation of a fit-for-purpose modern water-treatment technology, Nanotechnology Enabled Water Treatment (NEWT) will be performed at specific farm sites. The technology will allow the purification of compromised water sources to suitable quality for agricultural production. This intervention will not

only strengthen the water-use monitoring system but also reduce drought and its impact on ecosystems, crops and livestock. The installation of smart water meters will enable water-use monitoring and improve irrigation and water use efficiency.

Output 1.2: Water Use Efficiency of Prioritised Crops Increased through Climate-Smart Agriculture technology adoption

Activity 1.2.1 Determination of Crop Water Requirements

2.4 This activity will determine crop water use across agroecosystems, which can be used to project the impact of climate change on future water needs. This is especially important during periods of drought, which is projected to become more prolonged or frequent due to climate change. Smallholder farmers depend on an effective soil moisture balance to aid productivity and raise economic income. Crop water use is a key component for effective water management, as it identifies the requirements, relevance, potential and opportunities for improving the effectiveness of agricultural water management. This assessment will support efficient design of irrigation systems, effective irrigation scheduling and water resource planning.

Activity 1.2.2 Installation and Evaluation of Micro Irrigation and Fertigation Systems at Selected Farms

2.5 Micro and drip irrigation systems direct water to plant roots and are designed to conserve soil nutrients and minimize or prevent waste. These systems have several advantages. They can potentially use 30 to 50% less water than conventional irrigation systems and will therefore help conserve water and reduce evaporation in a region that faces reductions in water availability due to climate change. As they deliver water directly to plant roots, less water is available to support weed growth, which deprive plants of water and nutrients, increasing productivity. They are easily adjustable to fit individual crop needs. The installation of these will also ensure vulnerable smallholder farmers are able to co-produce and successfully deliver quality goods to the local and international markets.

2.6 Fertigation is a method of fertilizer application where fertilizer is incorporated within the drip-irrigation system. It is therefore an efficient method of fertilization as it promotes even and direct distribution of nutrients. It also facilitates a greater degree of control over the rate and timing of fertilizer release. This enhances farmer's efficiency in fertilizer use so that more crops of improved quality, can be produced with the same amount of fertilizer. This increases crop yield whilst addressing nutrient deficiency and protects agroecosystems. In addition, the efficiency of the process minimizes the possibility of fertilizer loss during periods of heavy rain or floods.

Activity 1.2.3 Soil Moisture Monitoring using Local Area Network Interconnectivity for Data Collection and Use

2.7 Soil moisture monitoring devices are available for a wide variety of crops and soil types. They can prevent over-irrigation and resultant diseases, as well as reduce fertiliser and pumping energy waste. In a drying region, water conservation is more important than ever, this technology can track rainfall, as well as the moisture it deposits in the soil, to ensure efficient timing and quantity of irrigation. In periods of agricultural drought, it can ensure deep irrigation is maintained. These devices can enable resilience among smallholder farmer communities.

Output 1.3: Enhanced capacity of farmers and extensionists to plan, design, install and operate on-farm water management systems

Activity 1.3.1 Identify Most Suitable Rainwater Harvesting Locations across the Island using the AGRI World Sources tool

2.8 Rainwater harvesting refers to a process of collection, storage, conveyance and purification of rainwater from surfaces. This system can provide a clean source of water particularly during periods of drought and as an adaptation action to flooding. Rainwater harvesting has the potential to reduce wet season water usage by ~30%. A water tank design rain harvesting system, for example, uses gravity for water flow, thereby reducing energy requirements for pumping. An absorption well design rain harvesting system also promotes water conservation as it can capture rainwater and channel it directly into the ground. The AGRI tool is an automated GIS tool to support the identification of suitable rainwater harvesting locations across the countries.

Activity 1.3.2 Ground-truth Suggestions Made by the Tool

2.9 The locations identified by the AGRI tool for rainwater harvesting will be verified and validated by field work in each country in conjunction with local stakeholders. This will ensure that the rainwater harvesting systems are effectively located to maximise adaptation potential.

Activity 1.3.3 Construct New Rainwater Reservoirs and Install Green and Grey Infrastructure and Equipment including Water Meters for Effective Water-use monitoring

2.10 Both green and grey infrastructure can play a critical role in climate-proofing the agriculture sector. These types of infrastructure combine the conservation and restoration of nature, such as rivers and floodplains with conventional approaches, such as reservoirs. Green infrastructure is a nature-based solution to the adverse impacts of climate change on the agriculture sector and includes the strategic use of natural land networks, working landscapes and other open spaces, in order to conserve ecosystem values and functions. It may include high nature value farmland and multi-use forests and other green surfaces which can be used as natural barriers and floodplains for protection from flood hazards. Green infrastructure includes human-engineered infrastructure for water resources such as water treatment plants and reservoirs. These types of infrastructure allow for environmental restoration and maximize ecosystem services. The use of water meters will help promote water conservation and management. Energy requirements for all installation will target renewable sources wherever possible.

Output 1.4: Enhanced Technical and Practical Capacity for Improved Water Management

Activity 1.4.1 Train Officers of the Ministry of Agriculture on the Use of Relevant Decision-making Support Tools (AGRI World Sources tool for identification of sites with high rainwater harvesting potential).

Activity 1.4.2 Train Farmers in the Use and Implementation of Selected Water Use Efficiency and CSA interventions

Component 2: Increasing farm system adaptive capacity through sustainable soil management (SSM) and protected agriculture

2.11 Soils are an essential and non-renewable natural resource hosting goods and services vital to ecosystems and human life. Sustainable soil management (SSM) is an integral part of sustainable land management, as well as a basis for addressing poverty eradication, agricultural and rural development, promoting food security and improving nutrition²⁴. Tropical soils are inherently poor, unhealthy and of low quality in relation to agricultural use. These characteristics impart low resilience and vulnerability to degradative processes, mainly erosion. SSM provides multifaceted benefits to meeting the United Nations Sustainable Development Goals (SDGs)²⁵, as well as the objectives of the Paris Agreement

²⁴ Food and Agriculture Organisation (2017).

²⁵ Food and Agriculture Organisation (2018), Hou et al. (2020).

through its implications for climate change adaptation and mitigation. Integrated soil fertility management (ISFM) is a widely promoted approach to improve agricultural productivity and input use efficiency, as well as reduce the impacts of climate change on low-input systems.

2.12 Protecting, conserving and enhancing soil health is critical to climate resilience and food security noting the dependence on extensive agriculture. However, alternatives production systems that afford greater control and management are important in securing livelihoods and strengthening adaptation. Protected agricultural systems are recognized adaptation technologies that compliment and facilitate improved agricultural water management, depends on environmental monitoring and integrates crop nutrition.

Output 2.1: Soil, Crop and Climatic Data Collection and Monitoring System Installed/upgraded

Activity 2.1.1 Upgrade Existing Weather Stations and Install Additional Stations for Sufficient Coverage

2.13 The upgrading of existing stations and installation of additional ones will not only expand the density of the observational network coverage but also enhance the accuracy of climate observations through the use of technologically advanced and automated equipment. This will improve the climatic data monitoring system at farm level, which can be used to develop early warning systems, facilitate adaptation planning and reduce barriers to adaptation.

Activity 2.1.2 Demonstration and Training in the Use of Agricultural Drones

2.14 An agricultural drone refers to an unmanned aerial vehicle used in agriculture operations for data collection mainly to optimize yield and monitor crop growth and production. Farmers and agribusiness owners can use these services for land and crop imaging, surveying topography and boundaries, soil and irrigation monitoring, as well as identifying locations for soil sampling. This will involve raising awareness of the technology and its benefits, particularly in the aftermath of natural disasters when accessibility and transportation routes to farms may be compromised.

Activity 2.1.3 Assess Existing and Where Necessary Develop Short Message Service (SMS) Agrometeorological and Agroecological Information Systems in Collaboration with the National Meteorological Services

2.15 The development and launch of SMS agrometeorological and agroecological information systems in collaboration with the National Meteorological Services (NMS), will enhance communication and connectivity among the NMS and farmers, as well as researchers and policymakers. When coupled with agricultural systems, these application tools can be useful for climate change adaptation within agricultural communities, through the provision and dissemination of agrometeorological and agroecological information. They can also promote secure and sustainable agricultural productivity.

Activity 2.1.4 Train Farmers in Data Collection, Monitoring and Analysis of Agro-climatic, Soil and Crop Data.

2.16 Farmers will be trained in data collection, monitoring and analysis of relevant climatic parameters, and soil and crop data. This would allow for data driven decision making at the farm level.

Output 2.2: Soil/land-based technologies and Climate Smart Agriculture Practices for outdoor and protected agriculture improved

Activity 2.2.1 Assessment of Soil and Land Management Practices

2.17 This will involve the assessment of present soil and land management practices in the context of climate change adaptation, to identify gaps, constraints and shortcomings, allowing for improvement. Assessment will also spatially differentiated land units to allow for baseline and post-intervention characterisation.

Activity 2.2.2 Enhancing Integrated Soil Fertility Management

2.18 ISFM includes a set of site-specific practices related to cropping, fertilizers and organic resources on smallholder farms, with the aim of enhancing soil fertility, crop productivity, input-use efficiency and the incomes of smallholder farmers. ISFM recognises the need to target nutrient resources within crop rotation cycles, thus going beyond single crop options and may include the use of improved seeds, planting dates and densities, as well as organic and inorganic fertilizers. ISFM is a useful tool in climate change adaptation as it enhances yield stability in rain fed systems and supports food security. Site specific ISFM plans will be developed from the baseline assessment and implemented on selected farms to demonstrate applicable technology and build capacity. SSM indicators and implementation of the Global Soil Doctors Programme will also be included.

Activity 2.2.3 Circularising Agricultural Waste Management

2.19 Under this activity an agricultural waste management system (AWMS) will be developed and implemented. An AWMS involves the installation and management of by-products of agricultural production in a sustainable manner, which enhances soil, crop, water and air quality. This system will focus on organic matter management, which includes various agricultural practices to maintain and increase the organic matter status of soils with the aim of improving soil health, in particular by providing, storing and releasing nutrients as well as by improving the soil structure, which in turn increases the infiltration and retention capacity of the water in the soil. Together, adoption of these techniques will support crop productivity, rejuvenate and maintain healthy soil ecosystem services particularly during periods of drought.

Activity 2.2.4 Site Specific Assessment of Protected Agricultural Structures

2.20 Water management at either end of the spectrum presents the greatest climate change hazard for tropical countries of the Caribbean. Increasing unpredictability of rainfall increases the agronomic and economic risk of extensive production, which sadly often results in loss of livelihood and increasing disenchantment with agriculture. Protected cultivation systems provide some control over the growing environment, particularly of environmental conditions allowing the grower more management control and when properly executed greater yield and quality. While these systems are not new their function related to design and purpose has not been properly evaluated nor has suitability assessment determined best models and systems for production. The project aims to evaluate and recommend protected systems based on local conditions and requirements.

Activity 2.2.5. Installation and Operation of Site-Specific Protected Agriculture Structures

2.21 Protected agricultural structures will be designed and installed and farmers supported through experiential training and capacity building in operations and management.

Output 2.3: Improved Technical Capacity and Data Management as it Relates to SSM and Protected Agriculture

Activity 2.3.1: Training Farmers in Soil/land-based Technologies and CSA Practices

2.22 Training will be provided to support in implementation of soil and land management practices, soil fertility management, agricultural waste management and installation and optimal use of site specific protected agricultural structures.

Component 3: Improving the Financial Stability of Small Farmers and Institutional Coordination to Scale up Climate-smart agriculture

2.23 Lack of financial resources, farm labour shortage and limited influence over global markets are just a few of the challenges facing the agricultural sector, coupled with heavy reliance on imported foods within the tourism sector and a shift in domestic consumption patterns to imported foods. To increase the capacity of small-scale farmers for climate change adaptation, it is important that they are able to access financial products and services that are geared towards climate resilience and their specific needs. The development of financing mechanisms and instruments such as farmers' insurance, farm-level insurance policies and climate-resilient business plans, in collaboration with financial intermediaries and insurance providers, and public-private partnerships will increase financial resilience for farmers and agricultural lending. This project aims to facilitate measures which will improve the capacity of smallholder farmers to access targeted financial products and services, aligned with the national development plans and policies to actively support poverty reduction strategies. The project also recognises the importance of data management and use throughout the value chain and appropriately communicated to consumers and other stakeholders.

Output 3.1: Investment in Climate-smart Agriculture de-risked and Small Farmers' Access to Financial Products and Services Improved

2.24 Small-scale farms are characterised by subsistence farming mostly by small and marginal holders, rudimentary production tools and technologies, as well as vulnerability to climate hazards, declining farm output and poor access to inputs. Achieving climate resilience within the agricultural sector will require significant transformation and modernisation, including adoption of climate-responsive technologies and farm infrastructure, which are dependent upon empowerment of farmers through agriculture finance. The project will comparatively assess existing products and services to other productive regions to inform on alternatives and improvements and improve access.

Activity 3.1.1 Assess National Financial Institutions Products and Services Aligned to CSA Adoption and Develop Targeted Alternatives where Necessary.

2.25 Collaborative efforts could yield many great results for the development of targeted, site-specific financial products and services for farmers. In response to the demand to partner with financial service providers to foster recognition of the concrete financing needs of smallholder farmers in the context of climate change, this project will work with national financial institutions to evaluate existing portfolios and produce targeted products and services aligned to CSA adoption.

Activity 3.1.2 Develop Climate-resilient Business Plans

2.26 This initiative will develop an innovative and sustainable way for farmers to increase adaptive capacity. It will outline a number of concrete actions designed to increase on farm climate resilience and adapt to a changing climate. These will include increased insurance coverage, disaster recovery plans and the addition of on-site energy sources to support the shift to climate smart agriculture and enable increased sustainability and long-term viability of farming operations in the project countries.

Activity 3.1.3 Develop a Portfolio of Farm Level Insurance Products, including a Framework for Access to Financial Support

2.27 In line with priorities to promote integrated farming systems to maximise smallholder farmer returns, the project will consult with relevant national and regional insurance and financial agencies to deepen relationships and engender willingness to support financial needs of smallholder farmers, whilst advocating for the development of the agriculture sector. Sources and types of farmers' insurance will be identified and catalogued e.g., the Caribbean Catastrophe Risk Insurance Facility which is designed to expand strategic public-private partnerships to increase financial security for farmers through provision of financial products, tools and services, such as risk financing and financial solvency regarding natural disasters related to climate change. Additionally, the project will evaluate the existing incentive and financial support systems available to farmers to adapt and build resilience to climate change. Revisions to existing systems to include public-private partnerships and explore alternative sustainable financing would be pursued.

Output 3.2: Improved Data Management Technical Capacity and Coordination in Public Sector and Financial Institutions to Scale up Climate-Smart Agriculture

Activity 3.2.1 Assess through value chain analysis the size and diversity of the domestic market to inform production quotas and crop planning.

Activity 3.2.2 Develop and establish agreements and conditions to reach quality and quantity quotas between farmers and public institutions (schools, universities, hospitals, jails)/private enterprises (hotels, restaurants, universities) and agroindustry.

Activity 3.2.3 Support farmer associations, particularly centred on women and youth, to meet established quotas and access local and international markets.

2.28 Potential challenges to the agricultural sector not only include weak market linkages between small farmers and large public and private buyers but also the islands' heavy reliance on imported foods for domestic consumption. There is a need to increase capacity of rural producers to facilitate collaborative production and supply of foods to meet consumer demand. Activity 3.2.1 will assess the size and diversity of the domestic market to inform production quotas and crop planning for smallholder farmers. This will provide producers with information in support of crop planning as well as post-harvest storage and value addition. The project will explore ways to support the establishment of agreements and conditions to reach quality and quantity quotas between farmers and public institutions including schools, universities, hospitals, jails and private enterprises such as hotels, restaurants, universities, and agroindustry under Activity 3.2.2. This is closely linked to Activity 3.2.3, which seeks to support farmer associations, particularly women and youth associations, to meet established quotas and access local and international markets. This element will contribute to improved livelihoods thereby lowering vulnerability to climate threats and will involve raising smallholder farmer awareness to increase their capacity to plan and design cropping strategies that absorb extreme weather shocks such as drought or heavy rainfall.

Activity 3.2.4 Train farmers (who participate in project activities) to develop sustainable business models to access loans for investments in climate-resilient technologies and production systems.

Describe how the project/programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project/programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund (AF).

Economic Benefits

2.29 This project is expected to address the issue of access to agricultural finance and insurance options related to climate hazards, with specific reference to farmers in vulnerable areas. The expected reductions in crop losses due to extreme climate events, coupled to increased income generation through adoption of more efficient climate-responsive technologies and enhanced climate services (e.g. SMS agrometeorological and agroecological information systems), which facilitate early warning can help farmers to plan ahead and manage climate variability and risk. Together these provide economic benefits by avoiding investment losses through crop loss and failure, as well as maximised crop productivity. Effective climate services, combined with adaptation and business plans to reduce the adverse impacts of climate change will significantly reduce farmers' input and loss costs. Reductions in production costs through the adoption of integrated farming systems will maximise resource use, while at the same time increasing financial returns from all activities. Recurring cultivation costs are reduced, thereby maximising profits in comparison to mono-cropping systems, for example. Climate-proofing agricultural assets will address risks along the agricultural value chain, which will include enhancing farmer capacity and increasing income.

2.30 The use of enhanced water usage methods and sustainable soil management systems will allow farmers to step into a more sustainable agricultural future allowing farmers to work smarter instead of working harder using modern climate-smart techniques, which safeguard the environment whilst also boosting the economy. This project also enables access to multiple financial products and services that can aid in improving the overall financial stability of farmers, thus improving the socio-economic status of farmers. The economic status of farmers will also be increased through activities such as capacity building and improved access to domestic markets and is therefore aligned with the AF which encourages access and equity specifically for marginalized or vulnerable groups such as small-scale farmers. Through the establishment of linkages with existing financial institutions and services, farmers in vulnerable areas will be better able to manage and adapt to larger and more frequent climate hazards, which will be cost-effective.

2.31 The system of co-production will allow gender equality in disaster risk preparedness and management through availability of reliable public information. This is expected to foster practical approaches towards achieving sustainable land use with economic empowerment of at least 30% of women and youth farmers under the project in support of increasing income generation. The project will further leverage regional knowledge-sharing advantages of combined and improved climate and weather data related to climate and agricultural advisories. The focus on institutionalising lessons learned through a regional approach provides an opportunity to innovate sustainable practices far beyond the project lifespan. This will build comparative advantages of all partnering countries and encourage relevant agricultural research to expand the understanding of targeted cropping systems. Stakeholder engagement will harness the benefits of agricultural research and draw on regional expertise and feedback. Lessons learned will be directly fed into events, such as regional forums, which provide field reviews and case studies with in-depth feedback to add value to disseminated information and encourage scaling up of activities to meet demands for fresh food in the domestic market, tourism and the hospitality sector.

Social and Gender Benefits

2.32 This project will utilise a participative approach, directly involving farmers, government and non-government entities, as well as the private sector and researchers at every stage of the process. It will therefore foster positive relationships (vertical cohesion), trust and a greater propensity for dialogue. The bottom-up, evidence-based approach to climate change adaptation will facilitate enhanced ownership to support the increased desire for collaborative agricultural production, which promotes sustainability. It will also ensure the voices of vulnerable and frequently marginalised groups

are heard, in relation to the provision of climate services and adaptation planning. Gender analysis is a useful tool in adaptation planning.

2.33 One of the main objectives of this project is the provision of support for farmer associations, particularly centred on women and youth associations allowing for greater access to local and international markets. The project will provide opportunities to enhance gender equality and activities will be designed to accommodate women, youth, persons with disabilities, as well as consideration of their tailored care and responsibilities. This will result in enhanced leadership roles, as well as reduce dependency and vulnerability. Climate change can bring about changes in gender relations and roles, particularly within the agricultural sector. Therefore, particular importance will be placed on the provision of education and training in the use of climate-smart techniques and agriculture to men, women and youth alike. Providing access and equal opportunity to women and youth can substantially strengthen the adaptive capacity of the agricultural sector. This can in turn empower women and encourage growth within the agricultural sector. The project supports capacity building and provides open access for men and women to the resources, rights and opportunities needed for climate change adaptation.

Environmental Benefits

2.34 The project is likely to have limited adverse environmental impacts that are readily identified. These impacts will be site specific or require mitigation measures that are readily known from its implementation can be addressed by employing known mitigation measures that are readily known and easily addressed.

2.35 This project will be largely beneficial to the environment as it will adopt climate-responsive technologies, including micro and drip irrigation, soil and land management, organic matter and agricultural waste management, which will encourage water-use efficiency, prevent depletion of strained water sources, increase primary production and nutrient cycling from organic matter and sustainable practices aimed at fostering natural resource management. Sustainable land management practices, including sustainable agriculture, provide important national and regional benefits. They contribute positively to fundamental ecosystem services such as water cycle regulation, carbon sequestration and aiding in the preservation of agrobiodiversity. It increases food security, primarily for smallholder farmers; provides local energy; provides local fresh and clean water. It preserves biodiversity at the farm level through agroforestry, intercropping, fallow and preservation of locally adapted seeds. Together they can also enhance ecosystem health and functionality.

2.36 The use of the AGRI World Sources tool²⁶, construction of rainwater reservoirs, installation of green and grey infrastructure and the use of nature-based climate adaptation solutions all have positive impacts on the environment and will help to reduce the impacts of climate change. Sustainable soil, soil fertility and land management, by improving soil health, will also prevent soil and land degradation, increase soil moisture enabling soil development. The project will also contribute to sustainable livelihoods, as improved land management will reduce deforestation and pressure on the natural environment.

Describe or Provide an Analysis of the Cost-effectiveness of the Proposed Project/Programme

2.37 This project is aligned with cost-effective measures for the implementation of strategies aimed at achieving climate resilience. The regional approach of this project, involving the sharing of expert resources and innovations at different levels, builds on best practices and enhances the existing regional and national capacity, as well as promotes educational capacity. The project encourages regional technical assistance and capacity building that will result in better contextualisation of methodologies

²⁶ More information can be accessed [here](#).

and strategies used in this project. The significant shared learning-by-doing between countries will promote tools developed to facilitate co-production in partnering countries and customized to deal with similar challenges in other territories.

2.38 A key element of the cost-effectiveness in this regional approach will be to deepen the understanding of best practices and leverage shared reliable climate information that can be readily translated into advisories and disseminated to public users. Specific regional capacity building will generate reliable product forecasts to reach all levels of community users. Hands-on training under the facilitation of regional expertise will generate relatable climate information that can be scaled alongside dialogue with experts to understand market demands and promote informed decision making. Sharing skills and expertise will enable the meteorological agencies and other stakeholders in the countries to piggyback on the skill sets and experience of peers across the agricultural sector.

Describe how the project/programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

Antigua and Barbuda

2.39 This project contributes to a number of international goals, including the SDGs, specifically zero hunger (SDG2) and clean water and sanitation (SDG6). Additionally, the project is aligned with the Paris Agreement which seeks to establish commitments towards adaptation and resilience to climate change. This project is in alignment with Antigua and Barbuda's national legal and regulatory frameworks, such as:

- (a) Environmental Protection and Management Act, 2019.
- (b) A National Food and Nutrition Policy and Action Plan for Antigua and Barbuda, 2004.
- (c) Food Security, National Resource and Rural Development in Antigua and Barbuda, 2003.

2.40 Antigua and Barbuda's Updated NDC (2021) details projects in support of its NDC implementation. The project titled 'Innovative technologies for improved water availability to increase food security in Antigua and Barbuda' aims to improve food security. It will do so by facilitating the availability and use of ground or surface water for agricultural purposes via innovative technologies. The proposed technologies for demonstration purposes run on self-generating renewable power, making them resilient to disruptions from grid instabilities or extreme climate events, and are aligned with the country's NDC target of transitioning to 100% renewable energy by 2030. Currently, water for agriculture is provided by Reverse Osmosis (RO) plants or through surface water catchments. The electrical grid that powers the RO plants run on heavy fuel oil, creating a large dependency for both the food and water sector on the importation and combustion of fossil fuels. This project would introduce technologies that have not been tested in the Agriculture Sector of Antigua and Barbuda and are new to the market. In addition, under its Pipeline of Priority Projects in the Green Climate Fund Country Programme (2020), insurance and resilience in the fisheries and agriculture sectors of Antigua and Barbuda has been included. As a means of achieving the finance goal of the Paris Agreement 2015 outlined in Article 2(1)(c), this pipeline project aims to provide the enabling environment for the alignment/development of the specific products from the private financial sector (i.e., banking and insurance) to de-risk climate-resilient development for the fisheries and agriculture sectors in Antigua and Barbuda.

2.41 The pipeline project will mainstream climate-resilient investment and de-risking options into Antigua and Barbuda's key economic sectors, including agriculture and fisheries. It has two primary objectives:

- (a) to build climate resilience in the financial sector; and
- (b) strengthen the resilience of farmers and fisherfolk to improve food security.

2.42 Financial resilience will be created by developing alternative finance models, focusing on financial tools to de-risk investments and improve insurance options, particularly for farmers and fisherfolk. This pipeline project will also increase climate resilience prior to, and after extreme climate events by engaging the private sector to facilitate investment in climate-smart adaptation interventions in these sectors, as well as rebuilding following extreme events. In addition to the financial resilience, the project will work with farmers and fisherfolk to build the resilience of their livelihood activities to extreme events, including exploring options for renewable energy and land/ocean management frameworks.

2.43 The Food and Nutrition Security Policy (2012) targets the critical food and nutrition security problems in Antigua and Barbuda. The Policy addresses constraints and aligns food availability with recommended per capita food consumption targets through specific strategies and interventions in domestic food production and food imports. It presents a portfolio of government interventions, both direct and indirect, to be utilised in promoting agriculture and food sector objectives. The policy seeks to:

- (a) Promote the sustainable production of safe, affordable, nutritious, good quality, Caribbean food commodities/products.
- (b) Ensure access of households and individuals to nutritious, safe and affordable food at all times with special attention to the food insecure and nutritionally vulnerable groups.
- (c) Promote healthy lifestyles and the commercialisation and consumption of safe, affordable nutritious and good quality food commodities/products.
- (d) Create an effective disaster preparedness and management system that can efficiently deal with the immediate and short-to-medium term food and nutrition security consequences of economic and financial shocks and natural disasters (hurricanes, drought, flooding, and earthquakes) while at the same time strengthen the resilience to those consequences among the most vulnerable population groups.

2.44 In addition, one of the guiding principles in the preparation of the policy framework includes Agriculture and Food Production: Recognising the vital role of the food and agriculture sector in the quest for national food and nutrition security and the need to strengthen its ability to attract youth and entrepreneurship as well as adequate investment in agricultural production, post-harvest handling, storage, distribution and exchange as an integral part of the private sector of Barbados and the Caribbean region and a major source of employment and incomes for a large segment of the population.

St Kitts and Nevis

2.45 This project aligns with key government policies and strategies in St. Kitts and Nevis within the areas of agriculture, rural development, climate change adaptation and gender equality according to national policies, legislation, strategies, priorities and objectives. The government aims to achieve regional development goals that support improvements in climate resilience related to building institutional capacities, increasing agricultural productivity and improving sustainable management.

2.46 The Revised NDC of St. Kitts and Nevis (2021) explicitly emphasizes strategies to enhance food and water security, and notes over USD700 million in economic damages following extreme weather and climate impacts. Amid ongoing mitigation and adaptation measures the government prioritizes climate change adaptation actions that include:

- (a) Expanding smart aquaponics and aquaculture systems.

- (b) Developing alternative livelihoods and training and diversity away from at-risk crops.
- (c) Introducing drought resistance technologies and species in animal husbandry.
- (d) Identifying and supporting methods to expand water supply and storage capacities.
- (e) Improving operational efficiencies.
- (f) Modelling and mapping coastal assets to support adaptation planning.
- (g) Develop and implement an emergency response plan for sargassum stranding.

2.47 The project is consistent with the Agriculture Policy Programme Caribbean Action for St. Kitts and Nevis including the analysis of market infrastructure and capacity building and training to strengthen multi-stakeholder dialogue and widen regional exposure. Under components 3 and 4 funding and training activities are included in knowledge shared in the Agri-Planners Forum and include national level support for developing policy framework recommendations. The Land Degradation Neutrality High-Level Note (2019) addresses the need to strengthen resilience of affected community livelihoods impacted by recent hazards to help achieve land degradation neutrality on a national scale toward generating communal environmental and social benefits that are key in addressing poverty, food security, availability of resource and income equality. The key project actions are supportive of achieving Land Degradation Neutrality by 2030 and reducing the rate of soil erosion by 15% by 2030 through sustainable land management practices and soil erosion prevention methods. Achievable through the environmental conservation activities proposed, the project aims at reducing the rate of soil degradation to improve land productivity on agricultural lands.

2.48 The National Climate Change Policy (2017) provides a policy framework for climate action in St. Kitts and Nevis whilst the National Climate Change Adaptation Strategy (2018) operationalizes the National Climate Change Policy focused on a participatory approach to gain input and recommendations from diverse stakeholder groups through national consultations. The Strategy details specific adaptation objectives and measures across eight sectors including agriculture stakeholder capacity building and engagement, information management, research and monitoring, integrated adaptation and disaster risk reduction, and inter-sectoral coordination for the time period of 2018-2030. Adaptation measures included in the National Climate Change Adaptation Strategy largely focus on building adaptive capacity and readiness including the enabling conditions needed for implementing effective adaptation; reducing exposure to climate hazards; and reducing inherent sensitivities to climate impacts and is consistent with project activities designed to highlight the importance of building capacity on a regional, long-term basis.

2.49 The National Environmental Summary (2010) for the government of St. Kitts and Nevis, the regional Comprehensive Disaster Management initiative incorporates disaster management in national development. This strategy along with other national efforts is used to minimize the impact of future disasters on the country. This summary highlights the lack of the financial resources for policy implementation and makes recommendations for various components of the current framework to be strengthened. The project is in alignment with some of these recommendations, which include provision of requisite training for staff; provision of relevant regulatory and enforcement capabilities of institutions; maintenance of a baseline of programmatic activities such as data collection and monitoring; the ability to use information from various sources for decision making; and the development of fiscal policies to stimulate corporate environmental stewardship, as well as to incentivise new business models that focus on the sustainable utilization of natural capital to attract foreign exchange. These are reinforced under this project in response through the provision of support to rural communities, resilience strategies for alleviating poverty by revamping the agriculture sector and reducing the impact of natural disasters on the poor through preparedness, adaptive farming practices and access to necessary social services.

St. Vincent and the Grenadines

2.50 The NAP (2019) seeks to prioritise climate change adaptation in national planning. It identifies agriculture as a key sector for climate change adaptation, emphasizing the urgent need. The agriculture sector was selected for the elaboration of the dedicated sectoral strategy and investment plan, to identify the main climate change impacts and associated vulnerability of the sector and potential adaptation options. The NAP also highlights the incorporation of new areas for adaptation, which may include a modified and improved agriculture system with technological support for new plants and possibly animal species. It also included the results from a gaps and needs assessment, several of which will be addressed through the implementation of this project. Some of these include: gender mainstreaming, data collection (climate projections, vulnerability, capacity) and technical adaptability. The specific objectives of the NAP are as follows:

- (a) To promote an enabling environment to facilitate the mainstreaming of climate change adaptation in the planning, budgeting, and implementation processes, by strengthening the governance structures to enhance synergies between adaptation and DRR26, including the identification, implementation, monitoring and evaluation and communication of adaptation actions.
- (b) To improve the capacity for data and information collection, management and sharing, determination of climatic risk and access to technology and financing for adaptation.
- (c) To implement adaptation actions toward an increased resilience of the most vulnerable Vincentians.

2.51 The Intended NDC (2015), highlights agriculture as one of the largest economic activities, which contributes significantly to the economic and social development of rural livelihoods in particular. This project is aligned with a number of climate change adaptation planning goals for the agricultural sector, which include support for small-scale farmers from the government in production technologies, agri-business management, good agricultural practices and pest and disease control; policy initiatives to address climate change issues, environmental protection, risk mitigation and fisheries development; and a national plan for dealing with food security. Alignment also occurs through enhancing the adaptive capacity of rural economies and natural resources to climate change through the management and protection of land based natural resources and agricultural production systems. There are also a number of adaptation plans for the water resource sector and these that are aligned with this project, and these include rooftop rainwater harvesting and the provision of potable drinking water when there is water scarcity or shortage of water available.

2.52 The Policy Framework and Strategic Plan for Agricultural Development (2012-2018) also supports the goals of this project, as there are a number of visions and goals outlined for rural sectors which include to:

- (a) Promote economic growth in rural areas while protecting the physical environment.
- (b) Support the development of human and social capital.
- (c) Assist in the creation of an environment that will facilitate investment in service and infrastructure in rural area.
- (d) Assist in the promotion of good governance.
- (e) Reduce poverty and unemployment markedly.

2.53 These are all in alignment with many of the goals of this project focused on the agricultural sector. In terms of Agricultural Lands, the goals of the policy (policy framework 8.6- the role of the agriculture sector and 8.7- agricultural land) include the following:

- (a) Ensuring the availability and accessibility of quality agricultural land for productive use by the present and future generations.

- (b) Motivating improved rates of productive utilisation of agricultural land.
- (c) Promoting the conservation of soil and water resources.

2.54 There are also goals aligned with agricultural credit (policy framework 8.9) which focus on improving the environment for increased lending to the agricultural sector by financial institutions. These types of systems aim to provide long term credit for farmer to finance capital investments. Policy Framework 8.12 is also aligned with this project as it focuses on Youth in Agriculture and intends to increase the attractiveness of agriculture to young people by reducing the constraints to involvement of youths in agriculture and highlighting and raising the profile of career paths in agriculture, agribusiness and conservation.

2.55 The Food and Nutrition Security Policy and Action Plan (2014) specifically includes the strategic approach to achieving food and nutrition security. Policy goal 4.1 focuses on Food Availability and seeks to ensure that consistent/stable supplies of affordable, nutritious, high quality food commodities are available to all people in St Vincent and the Grenadines, through the development of competitive and diverse domestic food production systems and sustainable level of food imports build primarily upon mutually collaborative links with CARICOM countries. The Strategic Objectives have a primary focus on ensuring the availability and accessibility of quality agricultural land and water resources for productive use. Additionally, there is focus on the creation of a competitive and diverse agricultural sector that would provide commodities for domestic consumption and for export (crops, livestock). These are both in alignment with the goals of this project. Under Strategic Objective B there is focus on stimulating greater involvement of Youth in Agriculture which is also one of the objectives and goals of this project.

Describe if there is duplication of project / programme with other funding sources, if any

2.56 This section will be further built out during the development of the full funding proposal since the participating countries had not provided the necessary information within the time the concept note was submitted.

If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

2.57 Targeted capacity-building and knowledge management will form part of all three project components. Specifically, emphasis will be placed on enhancing the accessibility and comprehensibility of water, soil, crop and agrometeorological data and experiences with climate-resilient food production in participating countries. This will be done through face-to-face training with farmers towards increasing their capacity to install relevant tools and technologies and to use and interpret agro-meteorological data. This would be supported by onsite demonstrations. Training manuals with step-by-step guides will be developed to provide additional support and policy briefs and case studies will be prepared for each session to share results.

Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

2.58 Caribbean countries that participated in the 37th session of the FAO Regional Conference for Latin America and the Caribbean endorsed the regional initiatives including “sustainable and resilient agriculture” and further requested integrated support and implementation of priority areas under the regional initiatives. This high-level consultation provided the framework for technical discussions and project idea definition. The project’s focus on agricultural water management, particularly improving farm WUE, sustainable soil management, farmers’ financial stability and data and information management, was defined through a participatory approach where stakeholders selected and ranked

climate related constraints to small farm crop production and commodity chains. A broad cross section of stakeholders was identified through existing networks, previous and ongoing projects, and interactions with respective national competent authorities. Digital tools and platforms were used to maximize reach and participation across the five countries initially considered (Antigua and Barbuda, Grenada, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines).

2.59 Subsequent to a desktop study and targeted online survey of key stakeholders, a regional inception meeting was held on March 15, 2022. The objective was to share and discuss key findings of the study and survey, broadly scope potential interventions, capture stakeholders' suggestions and concerns, and identify country focal points. Based on this first consultation, Antigua and Barbuda, SKN, and SVG were selected for the proposed initiative. To continue the dialogue with representatives from these three SIDS at the national level, discuss the proposed interventions in more detail, and agree on objective site selection criteria, country-specific technical meetings took place on July 28, 2022. They were followed by additional discussions with in-country stakeholders to facilitate completion of the site selection template. During the validation meeting on November 24, 2022, stakeholders ratified the priority areas of focus and reaffirmed that these are critical in responding to national adaptation needs in the agriculture sector. This resulted in the development of the present pre-concept outline. Between late November 2022 and January 2023, follow-up communication occurred with stakeholders at the national level to fill remaining data gaps. At all levels the outcomes of consultations were reflected in the development of the pre-concept.

Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

2.60 The project addresses a broken link in the agricultural value chain at the stage of production. Traditionally low yields²⁷ (sometimes below average) are associated with inadequate and inefficient crop management of which water and soil play critical roles. These resource inputs are also related and strongly integrated into climate systems. Regional climate change projections include impacts on water and land resources that require adaptation interventions, particular on small islands with small economies and low resilience.

2.61 Limited attention has been directed at soil management in the region. While island states are small, large variability exists requiring data driven decisions. The infrastructure and systems for data and information are less developed for soil resources and restricted to water resources authorities and regulators for water. Interventions fostering integration and harmonization, access and use of data in a changing climate is essential for sustainability. The alternative scenario with AF support is presented in the table below.

²⁷ FAO and CDB. 2019. Study on the State of Agriculture in the Caribbean Rome. 212 pp. License: CC BY-NC-SA 3.0 IGO

Table 3: Justification for AF Funds

Project Component	Baseline without Adaptation Funds	Alternative Scenario with Adaptation Funds
Improved agricultural water management	<p>Across the participating countries efforts have been actioned to improve on-farm and community water management. Rainwater harvesting is a best practice addressing availability. However, attention has not been directed at increasing WUE. Many farmers who use stored water are unaware of the sufficiency of supply relative to crop water demands.</p> <p>Where alternative sources of water are used, no consideration is given to water quality and its impacts on crop productivity and safety.</p>	<p>With AF support the assessment of crop water use and use efficiency across agro-ecological zones will be conducted. This information will be supplemented by other climatic data and used to create a decision-making unit informing the required storage capacity of rainwater harvesting units and production capacity. The information will allow assessment of projected changes in crop water use and WUE under future climate scenarios, allowing for adjustments.</p> <p>The implementation of modern water purification technology will address issues of poor water quality of alternative sources and also serve to supplement rain harvested water.</p>
Increasing farm system adaptive capacity through SSM and protected agriculture	<p>Soil management is largely restricted to land preparation using either hand or conventional tillage. Soil properties, particularly physical and biological are not monitored and included into management plans. Noting the importance of soil fertility to productivity, chemical properties are assessed, but outside of monitoring programmes and an understanding of the principles and application of ISFM. This has resulted in low return on investment and fertilizer use efficiency (FUE) on tropical soils with high nutrient loss capacities. The low FUE contributes to low yield and environmental pollution and addressing this will serve both adaptation and mitigation objectives.</p>	<p>Building capacity at the farm level for SSM and integrating it through proof-of-concept approaches will provide a programme-based strategy for climate change adaptation and mitigation. The AF support would strengthen the ability of technical stakeholders as well as farmers to conduct soil testing and develop site specific SSM and ISFM plans. Farmers will be guided by suitability analysis from soil and climatic data collection and benefit from management interventions including carbon sequestration. Successful demonstration of the cost effectiveness of selected SSM and ISFM practices coupled with improved farm water management will provide evidence for replication and up scaling. Combined with other projects (SOILCARE) data would be collected, stored and accessed under the Caribbean Soil Information System, while country analytical capacity</p>

		improved through the Caribbean Soil Laboratory Network.
Improving the Financial Stability of Small Famers	<p>No participating country has an agricultural marketing information system. Where such systems are absent farmers and value chain actors depend on traditional linkages and relationships to market produce. This ad-hoc approach limits commodity value chain development as it fosters little confidence in investors with no control of uncoordinated production on small farms. While multiple markets including specialty markets are present, there is a disconnect between market requirements and produce type and quality. A detailed analysis of accessible markets is required.</p> <p>Farm operation and development pivots on access to finance. This remains a challenge as small farm size limits traditional sources of finance. The products and services mainly focus on operational costs with limited consideration for developmental and adaptation financing. Most farmers depend on developmental banks and microfinance institutions which are buffered against the high-risk agricultural portfolio. Farmers are mostly responsible for risks associated with climate variation and change</p>	<p>An assessment of the size and diversity of local markets and the availability and access to market information will support crop planning and production quotas. Further development of data and information systems will strengthen investor confidence and contribute to market sustainability. Such systems are important to climate change adaptation as they allow for analysis of market structure and variability. Additionally, it will work in tandem with outputs of Components 1 and 2 to reveal opportunities for commodity value chains. Through the strengthening of farmer organizations and cooperatives, a sustainable solution to establishing and maintaining delivery agreements can be possible. AF will facilitate the establishment and/ or strengthening of farmer organizations allowing a collective approach to ensuring crop yields and quality.</p> <p>The project will sensitise and support financial institutions to align their products and services to support climate resilience building at farm level. A key aspect of climate resilience is farm insurance. Assessing the scope and conditions of available products would form the basis for developing a collaborative framework of farm level insurance products.</p>

Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

2.62 The sustainability of the project outcomes has been considered by ensuring the following:

- (a) There is adequate financial support, financing mechanism and management for follow-up activities in the project. In order to optimise resources and to guarantee optimal financial management of the project FAO has well established grant management and oversight procedures that mitigate these risks associated with financial management. FAO guarantees the operational efficiency, transparency, accountability and financial support, according to its policies and standards for financial management.
- (b) There is stakeholder buy-in to the project and direct involvement of key stakeholders at the regional and national levels including the participation of the relevant Ministries of the participating countries, local communities and small farmers from the outset of the project. The knowledge gained by stakeholders, including farmers and other local community members through training in the various areas of the project as well as the experience gained in their application, will be invaluable in ensuring that these approaches are actively adopted and hence contribute to the sustainability of the project outcomes. The documentation of lessons learned will support scaling up of the existing project as well as future project by allowing for better planning to anticipate and mitigate issues that may arise.
- (c) The infrastructure of the project including reservoirs and demonstration sites will be planned, designed, constructed, operated and maintained with involvement from the communities they are intended to serve. The communities will have equitable access and be part of the decision making in how these infrastructures are managed. The implementation of these infrastructure will have minimum or no negative environmental impact and will support the economic, financial, and social development of the communities over the entire infrastructure life cycle.
- (d) The project implementation and operation will adhere to local polices and governance arrangements in a manner that ensure there are continuous flow of net benefits to the communities and continued community involvement especially if policy or governance arrangements changes are needed.
- (e) The project was designed with scaling up and sustainability in mind. There is a commitment on the part of the participating countries to take the lessons from field-based activities implemented during the project and to replicate in other areas of the country. The lessons provided through implementation of various activities of the project could be used as the basis for upscaling the project.

Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

Risks Identified	Risk Classification	Mitigation Actions
The participating countries are prone to Natural Disasters, including, hurricanes and other tropical systems, flooding, as well as volcano eruptions and earthquakes, which can pose a risk to achievement of the project outputs.	Medium	An aspect of the project is resilience building against natural disasters and climate change through the promotion of Climate Smart Agriculture and Drought Risk Management technologies. An important focus of the proposed project is to mitigate the risks posed by climate change related natural disasters by strengthening the resilience of agroecosystems through the adoption of environmentally sound management practices. In addition, the project makes provision for the training of resource users and

		managers, including in-field training and demonstration which will prepare them to take the necessary proactive actions to withstand the shocks associated with meteorological events. Further, early warning systems will be monitored to adapt project activities where possible.
Lack of active participation by indigenous peoples.	Low	This project makes specific provision for activities to be undertaken in areas under the jurisdiction of indigenous peoples. Consequently, indigenous peoples will be key stakeholders and their representatives will participate in the decision-making and instructional structures designed for the implementation of the project.
Farmers unwilling to transition to the adoption of climate-smart tools, methods and technologies and sustainable livelihood practices.	Low	This project will engage farmers in in-field application and training. A key component of this exercise will be the establishment of marketing linkages to ensure that the products produced are sold, thus giving the farmers' livelihood sustainability. The project was designed to develop sustainable agricultural practices that generate economic benefits for local farmers, and local residents. In addition, information will be readily provided to stakeholder to allow them to make informed decisions, including the availability of targeted awareness materials.
The project could increase, directly or indirectly, gender inequalities in the target areas.	Low	The project will make every effort to avoid reinforcing/reduce existing gender inequalities in the project area. For the design of this concept note, a preliminary gender analysis has been carried out using available data and information for the target areas. A more thorough assessment will be conducted by a subject matter expert in the early stages of the full proposal preparation phase. This will help to obtain a more nuanced understanding of the specific gender-based roles, opportunities, and constraints affecting adaptive capacity in the project areas, and to ensure that the proposed interventions are truly gender-sensitive/-responsive. In addition, gender mainstreaming experience and guidance materials from previous FAO projects will enable the team to take appropriate action.
Labourers that establish demonstration sites could be exposed to extreme heat.	Medium	Occupational health and safety practices will be implemented.

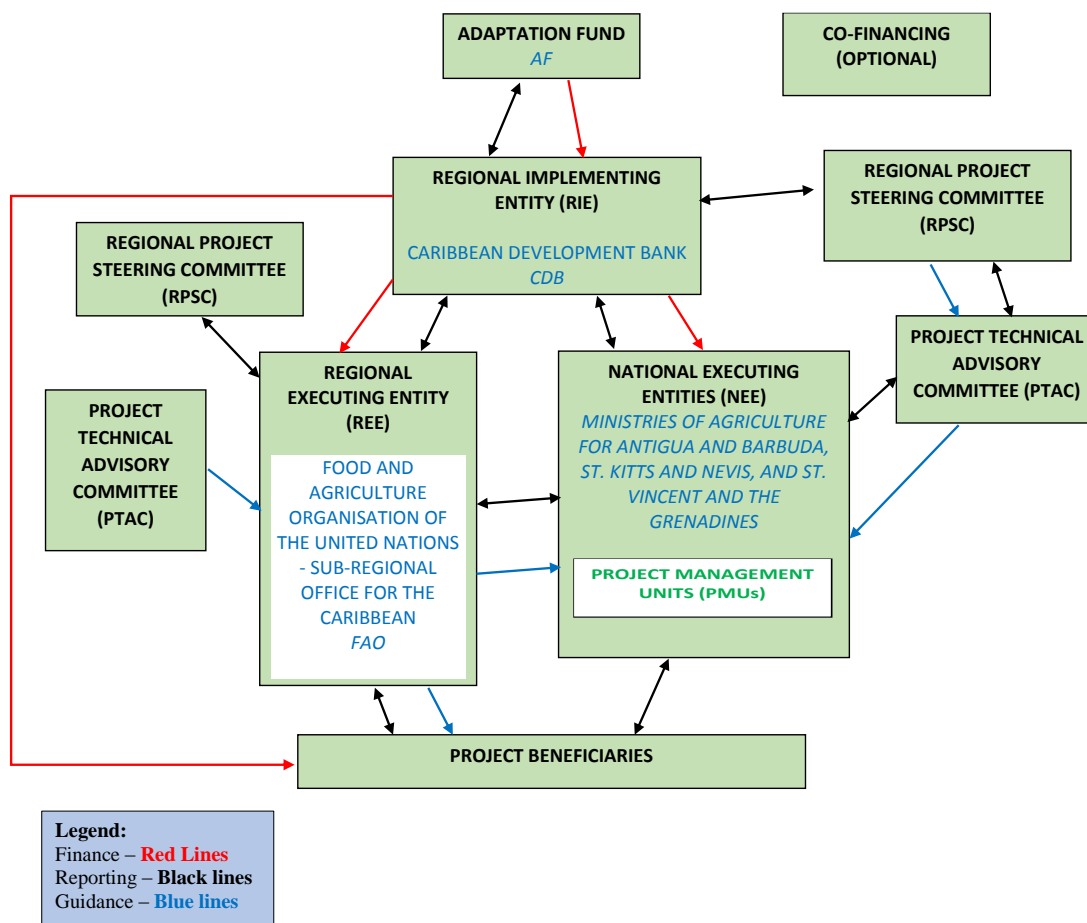
Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	No further assessment required, Project is consistent with all national law and policies.	
Access and Equity	Intervention sites selected using an objective selection criteria to ensure that the most vulnerable and feasible sites are included.	
Marginalised and Vulnerable Groups	No further assessment required.	
Human Rights	No further assessment required.	
Gender Equality and Women's Empowerment	No further assessment required.	
Core Labour Rights	No further assessment required.	
Indigenous Peoples	No further assessment required.	
Involuntary Resettlement	No further assessment required.	
Protection of Natural Habitats	No further assessment required.	
Conservation of Biological Diversity	No further assessment required.	
Climate Change	No further assessment required.	
Pollution Prevention and Resource Efficiency	No further assessment required.	
Public Health	No further assessment required.	
Physical and Cultural Heritage	No further assessment required.	
Lands and Soil Conservation	No further assessment required.	

PART III: IMPLEMENTATION ARRANGEMENTS

Arrangements for Project Implementation

3.1 Project management, financial monitoring and reporting to the AF will be coordinated by CDB, the Regional Implementing Entity. CDB will provide technical, fiduciary, and managerial support throughout all stages of project implementation. According to their respective areas of technical expertise and knowledge of the local conditions and stakeholder landscape, a part of the project activities will be executed by the Ministries of Agriculture in the participating countries and another part by FAO. As a regional executing entity, FAO will also provide overall technical support to the national executing entities.

3.2 A regional Project Steering Committee (RPSC) will be established with representatives from each country. The committee will have as its main task to provide climate policy direction and support to the executing agencies and to comment and review the results of the project from a policy perspective. Similarly, a Project Technical Advisory Committee (PTAC) will be established with representatives from participating countries. The purpose of the PTAC is to provide on-going technical advice to the executing entities. The PTAC will report to the RPSC. Project Management Units will be established in each of the participating countries and will be headed by a project manager.



Describe the measures for financial and project/programme risk management.

3.3 The following table will be developed further following discussions with partners during the preparation of the full funding proposal.

Type	Risk	Risk Management	Rank
Financial	Disbursements not received on time	Ensure that disbursements are properly aligned with project implementation time. Ensure that equipment required is procured from initial disbursements.	Medium
Financial	Institutional protocols regarding transfer of funds from execution to implementing agencies.	Ensure a robust structure is in place that satisfies the requirements of respective agencies prior to project implementation.	Low
Social	Limited participation at the community level.	Sustained Engagement with community groups from selected sites during the project development phase.	Low
Institutional	Fragmentation amongst state agencies amongst and within various countries.	Project Manage Unit will consist of persons from all state ministries involved. Quarterly meetings will be convened to ensure all parties are appropriately informed and involved.	Medium

Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

3.4 This section will be built out in line with the Environmental and Social Policy of CDB and the Adaptation Fund. The environmental and social impacts will then be fully determined and categorised.

Describe the monitoring and evaluation arrangements and provide a budgeted Monitoring and Evaluation plan, in compliance with the Environmental and Social Policy and the Gender Policy of the AF.

3.5 A Monitoring and Evaluation (M&E) Framework will be developed and used to measure accountability and performance, assess results, effectiveness, processes and partner performance as well as to facilitate and assess learning, feedback, and knowledge sharing based on results and lessons learned. The use of this framework will also help the project to determine whether the activities address the different priorities and needs of women, men, youth and indigenous people as well as to assess the

impact on gender relations. The design of the M&E Framework will follow SMART goals setting techniques as well as the Gender Policy of the Adaptation Fund. To ensure the effectiveness of the 'gender-specific monitoring and evaluation' system it will be essential that all data is collected, presented and analysed in a sex-disaggregated manner. In addition, regular evaluations of the project (including midterm review and terminal evaluation), and ongoing monitoring will be conducted.

Include a Results Framework for the project proposal, including milestones, targets and indicators, including one or more core outcome indicators of the Adaptation Fund Results Framework, and in compliance with the Gender Policy of the Adaptation Fund.

Table 4: PRELIMINARY RESULTS FRAMEWORK	
EXPECTED RESULTS	INDICATORS
Goal 1: Improving agricultural water management	
Impact: Reduced strain on water resources through enhanced on-farm water management including storage, treatment of communal water sources of low quality and improved water distribution, application and use efficiency. These interventions address the impact that drought and heat waves are exerting on ecosystems, crops and livestock.	
Output 1: Climate-resilient infrastructure and technologies in place to supply water to the farms in a sustainable manner.	
Target 1.1: Determine of the suitability of water treatment options in each community.	1.1 Assessment report on need for water treatment.
Target 1.2: Installation of NEWT and other selected smart technologies at selected sites.	1.2. Number of installations.
Output 2: Water Use Efficiency of prioritized crops increased through Climate-Smart Agriculture technology adoption.	
Target 2.1: Determine Crop water requirements.	2.1 Database of crop water requirements for selected crops.
Target 2.2: Installation and evaluation of Micro irrigation and fertigation systems at selected sites.	2.2 Number of installed irrigation systems in communities.
Target 2.3: Soil moisture monitoring using LAN interconnectivity for data collection and use.	2.3 Number of soil monitoring probes installed. Report on the operationalisation of the LAN.
Output 3: Enhanced capacity of farmers and extensionists to plan, design, install and operate on-farm water management systems.	

Table 4: PRELIMINARY RESULTS FRAMEWORK	
EXPECTED RESULTS	INDICATORS
Target 3.1 Identify sites suitable for rainwater harvesting using the AGRI World Sources tool/	3.1 Number of potential sites identified. Map showing identified sites.
Target 3.2 Ground Truthing of AGR World sources tool outputs.	3.2 Validation of selected sites.
Target 3.3 Construct rainwater harvesting reservoirs and install green and grey infrastructure.	3.3 Number of rainwater harvesting reservoirs constructed.
Output 4: Enhanced technical and practical capacity for improved water management	
Target 4.1 Train all relevant personnel in the installation, use and management of WUE interventions.	4.1 Number of persons trained. Training workshop report.
Goal 2: Increasing farm system adaptive capacity through sustainable soil management (SSM) and protected agriculture.	
Impact: Increased production of agricultural produce by expanding area of production and productivity.	
Output 1: Soil, crop and climatic data collection and monitoring system installed/upgraded	
Target 1.1 Upgrade existing weather stations and install additional stations for sufficient coverage.	1.1 Number of automated weather stations installed. Database for storing and retrieving information.
Target 1.2 Demonstration and Training in the use of agricultural drones.	1.2 Workshop report on demonstration and training in the use of agricultural drones. Number of drones purchased.
Target 1.3 Assess and develop where necessary SMS agroecological and agroecological information systems in collaboration with National meteorological services.	1.3 Data sharing agreement with Met Offices. Development of an agricultural met forecasting system.
Output 2: Soil/land-based technologies and CSA practices for outdoor and protected agriculture improved	

Table 4: PRELIMINARY RESULTS FRAMEWORK	
EXPECTED RESULTS	INDICATORS
Target 2.1 To be completed.	2.1 To be completed.
Target 2.2 To be completed.	2.2 To be completed.
Target 2.3 To be completed.	2.3 To be completed.
Output 3 Improved technical capacity and data management as it relates to SSM and protected agriculture	
Target 3.1 Train all relevant personnel in the use and soil/land-based technologies and CSA practices.	3.1 Number of persons trained (workshop attendance). Workshop report.
Target 3.2 Develop data sharing policy and knowledge sharing platform for agricultural data and information.	3.2 Draft regional data sharing policy.
Goal 3: Improving the Financial Stability of Small Famers and institutional coordination to scale up climate-smart agriculture	
Impact: Improved livelihood of farmers and farming communities.	
Output 1: Investment in climate-smart agriculture de-risked and small farmers' access to financial products and services improved	
Target 1.1 Train farmers to develop sustainable business models to access loans for investments in climate- resilient technologies and production systems.	1.1 Number of farmers with sustainable business models. Training workshop report.
Output 2: Improved data management technical capacity and coordination in public sector and financial institutions to scale up climate-smart agriculture	
Target 2.1	

Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s) ²⁸	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
1. Improved agricultural water management	<ul style="list-style-type: none"> • Reports on the status of agricultural water resources in participation countries. • Map and report identifying suitability of communities for irrigation interventions. • Assessment report on need for water treatment. • Number of installations • Database of crop water requirements for selected crops. • Number of installed irrigation systems for in communities. • Number of soil monitoring probes installed. Report on the operationalization of the Local Area Network. 	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	<p>3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses.</p> <p>3.2. Percentage of targeted population applying appropriate adaptation responses.</p>	9,000,000

²⁸ The AF utilised OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply.

<p>2. Increasing farm system adaptive capacity through sustainable soil management (SSM) and protected agriculture</p>	<ul style="list-style-type: none"> • Number of automated weather stations installed. Database for storing and retrieving information. • Workshop report on demonstration and training in the use of agricultural drones. Number of drones purchased. • Data sharing agreement with Met Offices. Development of an agricultural met forecasting system. • Assessment reports for SLM and protected agricultural structures. • Productivity of farms with SSM and ISFM interventions. • Number of farmers that incorporate agricultural waste management into their operations. • Number of protected agricultural structures installed and operational. • Number of persons trained (workshop attendance). Workshop report. • Draft regional data sharing policy. 	<p>Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.</p>	<p>6.1 Percentage of households and communities having more secure access to livelihood assets.</p> <p>6.2. Percentage of targeted population with sustained climate resilient alternative Livelihoods.</p>	<p>2,000,000</p>
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3. Improving the Financial Stability of Small Famers and institutional coordination to scale up climate-smart agriculture	<ul style="list-style-type: none"> • Number of new financial products and services available to farmers (Special services for females and youth clearly identified). • Number of farmers with resilient business plans. • Completed framework. • Value chain assessment report. • Draft framework agreement. • Number of farmers with sustainable business models. • Training workshop report. 	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	<p>6.1 Percentage of households and communities having more secure access to livelihood assets.</p> <p>6.2. Percentage of targeted population with sustained climate resilient alternative Livelihoods.</p>	864,000
4. Total Project Cost				11,864,000
5. Project Execution Cost (9.5% of Total Project Cost)				1,127,080
6. Project Cycle Management Fee charged by the Implementing Entity (8.5% of Total Project Cost)				1,008,440
Amount of Financing Requested				13,999,520

Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

3.6 This section to be completed during preparation of the full funding proposal.

Include a disbursement schedule with time-bound milestones.

3.7 This section to be completed during preparation of the full funding proposal.

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government²⁹

Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project/programme. Add more lines as necessary. The endorsement letters should be attached as annexes to the project/programme proposal.

Ms. Diann Black-Layne Director of Environment and Ambassador for Climate Change Department of Environment, Ministry of Health and the Environment Antigua and Barbuda	Date: April 20, 2023 Endorsement letter was submitted.
Ms. Sharon Rattan Permanent Secretary Ministry of Environment and Climate Action Saint Kitts and Nevis	Date: May 24, 2023 Endorsement letter was submitted.
Mr. Recardo Frederick Director of Economic Planning Ministry of Finance, Economic Planning and Information Technology Saint Vincent and the Grenadines	Date: May 03, 2023 Endorsement letter was submitted.

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person’s name, telephone number and email address

I certify that this pre-concept proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans of the participating countries of Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines, and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Name & Signature

Implementing Entity Coordinator: Ms. Valerie Isaac

Valerie Isaac

Date: (Month, Day, Year)

07/03/23

Tel. and email: 1 (246) 539-1742

Valerie.isaac@caribank.org

Project Contact Person(s): Mr Luther St. Ville and Mr. Derek Gibbs

Tel. And Email:

Mr Luther St. Ville - luther.stville@caribank.org
1 (246)539-1688

Mr. Derek Gibbs – derek.gibbs@caribank.org
1 (246)539-1928



GOVERNMENT OF ANTIGUA AND BARBUDA

Department of Environment
Ministry of Health, Wellness and the Environment
#1 Victoria Park, Botanical Garden
P.O. Box W693
St. John's
Antigua, W.I.
Tel: (268) 462-6265
Fax: (268) 462-4625
Email: doe@ab.gov.ag

April 20, 2023

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for “Building Climate Resilience of Agriculture Sector”

In my capacity as designated authority for the Adaptation Fund in Antigua and Barbuda, I confirm that the above regional project proposal is in accordance with the government's regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Caribbean.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Caribbean Development Bank (CDB) and executed by the Food and Agriculture Organization of the United Nations (FAO) and the Ministries responsible for Agriculture in Antigua and Barbuda, Saint Kitts and Nevis, and Saint Vincent and the Grenadines.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. Black-Layne".

Mrs. Diann Black-Layne
Director of Environment and Ambassador for Climate Change
Department of Environment, Ministry of Health and the Environment
Antigua and Barbuda

Tel: (869) 467-1177/1178
Email: environment@gov.kn



Ministry of Environment, Climate Action,
and Constituency Empowerment
Unit C2, Sands Complex
Bay Road
Basseterre

SAINT CHRISTOPHER AND NEVIS



Letter of Endorsement by Government

24th May 2023

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for “Building Climate Resilience of Agriculture Sector”

As designated authority for the Adaptation Fund in Saint Kitts and Nevis, I confirm that the above regional project proposal is in accordance with the government’s regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Caribbean.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Caribbean Development Bank (CDB) and executed by the Food and Agriculture Organization of the United Nations (FAO) and the Ministries responsible for Agriculture in Antigua and Barbuda, Saint Kitts and Nevis, and Saint Vincent and the Grenadines.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Sharon Rattan', followed by a dotted line indicating the end of the signature.

Ms. Sharon Rattan
Permanent Secretary
Ministry of Environment, Climate Action,
And Constituency Empowerment



ECONOMIC PLANNING DIVISION
Ministry of Finance, Economic Planning and Information Technology

Administrative Centre, Bay Street
Kingstown, St. Vincent and the Grenadines
Tel.: (784) 457-1746 Fax: (784) 456-2430 Email: cenplan@svgcpd.com

May 3, 2023

Ms. Renata Clarke
The Adaptation Fund Board
The Adaptation Fund Board Secretariat
1818 H Street NW
MSN N7-700
Washington, D.C., 20433
U.S.A

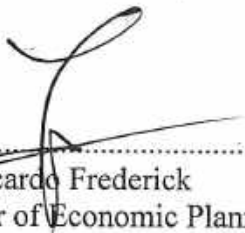
Dear Ms. Clarke,

Subject: Endorsement for “Building Climate Resilience of Agriculture Sector”

In my capacity as designated authority for the Adaptation Fund in Saint Vincent and the Grenadines, I confirm that the above regional project proposal is in accordance with the government’s regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Caribbean.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Caribbean Development Bank (CDB) and executed by the Food and Agriculture Organization of the United Nations (FAO) and the Ministries responsible for Agriculture in Antigua and Barbuda, Saint Kitts and Nevis, and Saint Vincent and the Grenadines.

Yours sincerely,


.....
Mr. Ricardo Frederick
Director of Economic Planning
Ministry of Finance, Economic Planning and Information Technology
Saint Vincent and the Grenadines



Project Formulation Grant (PFG)

Submission Date: 06/30/2023

Adaptation Fund Project ID:

Country/ies: Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines

Title of Project/Programme: Building Climate Resilience of Agriculture Sector

Type of IE (NIE/MIE): Regional

Implementing Entity: Caribbean Development Bank

Executing Entity/ies: Food and Agriculture Organization of the United Nations – Sub-regional Office for Caribbean, and ministries responsible for Agriculture in Antigua and Barbuda, St. Kitts and Nevis, and St. Vincent and the Grenadines (National)

A. Project Preparation Timeframe

Start date of PFG	September 1, 2023
Completion date of PFG	March 30, 2024

B. Proposed Project Preparation Activities (\$)

Describe the PFG activities and justifications:

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>a. Assess the climate change problem as well as other relevant conditions in each of the three partner countries, define sub-projects, identify project sites, and undertake feasibility analysis to inform sub-project design.</p> <p>b. Under this Activity the consultants/firm will lead the process of identifying the sub-projects to be implemented in each partner country. To accomplish this, the consultants/firm will:</p> <p>c. work with government stakeholders, farming communities and other relevant actors to identify and prioritise specific sites for the sub-projects based on agreed selection</p>	<ol style="list-style-type: none"> 1. Stakeholder engagement plan. 2. Baseline study and climate change vulnerability and impact assessment report. 3. Project area and implementation site selection report, inclusive of maps with georeferenced information. 4. Description of clearly defined sub-projects and recommended adaptation solutions per country. 	40,000	TBD

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>criteria.</p> <p>a.</p> <p>d. based on outputs of relevant projects led by Food and Agriculture Organization (FAO) and other agencies (e.g., Green Climate Fund Readiness project in Saint Vincent and the Grenadines), study the vulnerability to climate change in each country, with a specific emphasis on the agriculture sector, and assess the observed and projected impacts of climate change on local production systems as well as barriers to effective adaptation, define the key climate change challenges and opportunities in regard to the project sites (justification for choosing these sites).</p> <p>e. based on outputs of relevant projects led by FAO and other agencies (e.g., SOILCARE Phase 1 and project addressing the water-agriculture nexus in Antigua and Barbuda under FAO's Technical Cooperation Programme), collect baseline information to inform the design of the sub-projects. This will include assessing soil health and analyzing current agricultural water supply and management systems as well as water use efficiency of prioritized crops with a view to identifying gaps and improving infrastructure and technical capacity, amongst others.</p> <p>f. scope and evaluate potential interventions, in particular soil-based technologies and climate-smart agricultural practices for open field and protected cultivation.</p> <p>g. carry out the necessary feasibility studies in each partner country to inform sub-project design. This will include technically appraising the proposed adaptation solutions, analyzing the cost-benefit ratio and</p>	<p>5. Consolidated feasibility study that is informed by individual country studies completed.</p>		

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>cost-effectiveness of these; assessing the regulatory, policy and institutional environment and private sector landscape; and undertaking a project financial analysis.</p> <p>h. develop a stakeholder engagement plan.</p>			
<p>a. Undertake a Gender Assessment, prepare a Gender Action Plan, conduct an Environmental and Social Impact Assessment (ESIA) and develop an Environmental and Social Management Plan (ESMP) for the project/programme in the three countries. This will be done according to the Adaptation Fund (AF) requirements and those of the Implementing Entity and will inform the design of the project/programme.</p> <p>b. Under this activity the consultants/firm will:</p> <p>Gender Assessment and Gender Action Plan:</p> <p>a. Undertake desk review of all relevant documents.</p> <p>b. Using differential participatory and consultative (qualitative) as well as quantitative methodologies, conduct a comprehensive gender analysis of the project. This will include examining the different roles, rights, needs and opportunities of women and men in the context of the proposed project and the respective partner countries; their access to resources, services, and capacity development; their activities; and the constraints they face relative to each other. This assessment will specifically consider the baseline knowledge, attitudes and practices (KAP) of females and males with regards to climate change, climate</p>	<p>1. Consolidated Gender Assessment completed and Gender Action Plan prepared.</p> <p>2. Consolidated ESIA and ESMP completed and informed by the Gender Assessment.</p>	25,000	TBD

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>variability and adaptation in the agriculture sector and draw on data and information produced under relevant initiatives (e.g, the EnGenDER project in Antigua and Barbuda and Saint Vincent and the Grenadines). The analysis will adopt an intersectionality perspective which will allow cross-referencing of intersecting variables such as age, disability, and geographic location.</p> <p>c. Design and implement a post evaluation assessment of primary and secondary (institutional) beneficiaries, disaggregated by sex, to measure changes in KAP.</p> <p>d. Recommend project design features that help address existing gender disparities and foster gender equality.</p> <p>e. Undertake public consultations.</p> <p>f. Define gender-sensitive/-responsive indicators and associated mid-term and final targets to be included in the logical framework at impact, outcome and output level; determine the budgetary allocations for undertaking each of the proposed gender-sensitive/-responsive activities; and recommend mechanisms to ensure implementation of the gender action plan.</p> <p>ESIA and ESMP:</p> <p>a. For each partner country, identify the nature and magnitude of any actual or potential changes to the physical, biological, climatic and socio-economic and cultural environment that may result from the proposed project, and rate the probability of these risks occurring.</p>			

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>b. Determine the environmental and social impacts of the project construction and operational impacts, both negative and positive.</p> <p>c. Develop an ESMP that identifies measures to avoid, minimise or mitigate and compensate the potential negative environmental and social risks. Specifically, the ESMP will provide details on the project outputs, environmental and social project impacts, mitigation measures being proposed, their estimated costs, parameters to be measured, frequency or timing of measurements and responsibilities for monitoring and reporting during the project's life cycle.</p> <p>d. Undertake public consultations of potentially affected groups and civil society organisations in a culturally appropriate, non-discriminatory and gender sensitive manner to improve the understanding of local conditions and stakeholders' concerns and enable the co-development of appropriate risk mitigation measures.</p> <p>e. Outline the institutional arrangements for implementing the ESMP, including provisions for supervision and regular monitoring.</p>			
<p>Formulate the project/programme full funding proposal guided by the outline and requirements of the AF – “Fully Developed Proposal for Regional Project/Programme” template. A summary of the requirements of the template is provided below:</p> <p>PART I: PROJECT/PROGRAMME INFORMATION</p> <p>a. Project/Programme Background and Context</p>	<p>1. Completed Funding Proposal with all necessary annexes and terms of references for consultancies to support project implementation.</p>	<p>35,000</p>	<p>TBD</p>

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>b. Project/Programme Objectives</p> <p>c. Project/Programme Components and Financing</p> <p>PART II: PROJECT/PROGRAMME JUSTIFICATION</p> <p>a. Describe the project/programme components, particularly focusing on the concrete adaptation activities.</p> <p>b. Describe how the project/programme would promote new and innovative solutions to climate change adaptation.</p> <p>c. Describe how the project/programme would provide economic, social and environmental benefits.</p> <p>d. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme.</p> <p>e. Describe how the project/programme is consistent with national or sub-national sustainable development strategies.</p> <p>f. Describe how the project/programme meets relevant national technical standards.</p> <p>g. Describe if there is duplication of project/programme with other funding sources.</p> <p>h. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.</p> <p>i. Describe the consultative process, including the list of stakeholders consulted, undertaken during project/programme preparation.</p> <p>j. Provide justification for funding</p>			

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
<p>requested, focusing on the full cost of adaptation reasoning.</p> <p>k. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project/programme.</p> <p>l. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project/programme.</p> <p>PART III: IMPLEMENTATION ARRANGEMENTS</p> <p>a. Describe the arrangements for project/programme management at the regional and national level, including coordination arrangements within countries and among them.</p> <p>b. Describe the measures for financial and project/programme risk management.</p> <p>c. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.</p> <p>d. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.</p> <p>e. Include a results framework for the project/programme proposal, including milestones, targets and indicators.</p> <p>f. Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund.</p> <p>g. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the</p>			

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount	Co-financing (USD)
Implementing Entity management fee use, and an explanation and a breakdown of the execution costs. h. Include a disbursement schedule with time-bound milestones.			
Total Project Formulation Grant		100,000	

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation.

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person(s)	Telephone	Email Address
Ms. Valerie Isaac Caribbean Development Bank	<i>Valerie Isaac</i>	07/03/23	Mr. Luther St. Ville Mr. Derek Gibbs	1 246 539-1688 1 246 539-1928	Luther.stville@caribank.org Derek.gibbs@caribank.org