AFB/PPRC.34/Inf.16
11 September 2024

Adaptation Fund Board
Project and Programme Review Committee
Thirty-fourth Meeting
Bonn, Germany, 8-9 October 2024

PROPOSAL FOR SAINT KITTS AND NEVIS

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project Concept

Country/Region: Saint Kitts and Nevis
Project Title: Coastal Adaptation and Resilience Initiative – St. Kitts and Nevis (CARI-SKN)
Thematic Focal Area: Coastal
Implementing Entity: Caribbean Community Climate Change Centre (CCCCC)
Executing Entities: Ministry of Public Infrastructure et al. (GovSKN)
AF Project ID: AF00000393
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): 10,000,000
Reviewer and contact person: Camila Florez
Co-reviewer(s): Dirk Lamberts
IE Contact Person:

Technical Summary	The project "Coastal Adaptation and Resilience Initiative – St. Kitts and Nevis (CARI-SKN)" aims to create a coastal zone management framework in St. Kitts and Nevis that enables financing of critical coastal resilient infrastructure and coastal ecosystem protection measures. This will be done through the four components below: Component 1: Strengthening the regulatory and political framework for integrated coastal zone management (USD 975,000); Component 2: Strengthening data management and monitoring systems (USD 1,000,000); Component 3: Strengthening of coastal resilient infrastructure and coastal ecosystem protection measures (USD 5,950,000); Component 4: Financing mechanism for the maintenance (and potential financing) of coastal resilience measures is established (USD 400,000). Requested financing overview: Project/Programme Execution Cost: USD 825,000 Total Project/Programme Cost: USD 9,150,000

	Implementing Fee: USD 850,000 Financing Requested: USD 10,000,000 The initial technical review raises several, such as the project's cost-effectiveness, its compliance with AF's gender, and clarity on the main adaptation actions to be implemented under Component 3, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review.
Date:	June 11, 2024

Review Criteria	Questions	Comments
Country Eligibility	1. Is the country party to the Kyoto Protocol, or the Paris Agreement?	**Yes.**
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	**Yes.** The country is particularly vulnerable to more frequent and intense storms, rising sea levels, and increased rates of coastal erosion, which is impacting vulnerable coastal communities and ecosystems.
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	**Yes**. As per the Endorsement letter dated May 23, 2024.
	2. Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes?	**Yes.** **CAR1**: Please note that section III is only required for the fully developed proposal and does not need to be submitted for the concept note stage.
	3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	**Unclear.** The project supports updating the institutional and financial framework for coastal adaptation, by revising existing legislation and policies, developing a coastal monitoring system, and setting a payment for coastal resilience mechanism.

		The project also largely supports coastal infrastructure interventions and the protection and rehabilitation of coastal ecosystems. However, the climate change adaptation relevance of the project activities depends to a large extent on that of Component 3, constituting the bulk of the funding requested. These concrete intervention activities are USPs, precluding at this stage adequate appreciation of their relevance. **CR1:** The project, under Component 3, seeks to develop a project implementation tool to support coastal management measures. However, it is unclear what type of coastal measures will be taken. How would these respond to the climate hazards identified? And who will lead their implementation? Does the proposed project support the implementation of adaptation measures by third parties, or would the project team lead the implementation of the selected measures? Where would the activities be located? This component requires USD$5.9 million, a significant amount of funds to finance activities that have not been sufficiently identified nor have a specific location where they can be implemented (USPs). Please be advised that fully unidentified activities are not allowed, and there is no justification for why it would not be possible to identify these activities at the time of project formulation. Kindly refer to the Fund's revised guidance on USP available here: https://www.adaptation-fund.org/wp-content/uploads/2021/05/Updated-guidance-on-USPs-.pdf Please identify all the activities of Component 3. **CR2**: Several of the activities of Component 3 (e.g. restoration of coral reefs, coral transplantation, artificial reefs, etc.) seem unconnected to the

		challenges described. The effectiveness and sustainability of some activities like the sand replenishment are not demonstrated. Please clarify how the proposed activities will build adaptive capacity. **CR3**: The activities of Component 1 focus on intra-governmental coordination. It is unclear from the proposal how likely it is that its objectives will be achieved. The justification for Component 1 is a mere statement, without demonstration or indication of its relevance. Please clarify which regulations will be addressed under Component 1 and how that will address actual barriers beyond broad statements that coastal zone management mainstreaming is lacking. **CR4**: Component 1 and 3 include the establishment of a coastal zone management committee, but it is unclear if or to what extent this is aligned with government policy. Please clarify the government's commitment to such a committee, and clarify its institutional anchoring and funding. Please also clarify what regulatory arrangements are required. **CR5**: Regarding component 2, the concept note proposes updating existing maps, and coastal vulnerability assessments. How many assessments will be updated? What do these assessments focus on, and do they focus on particular districts or economic sectors? Please also describe the main dimensions of the Climate and Ocean Risk Vulnerability Index (CORVI), and how updating this CORVI study result is relevant considering that it was done very recently, and that it has no forecasting capabilities.

		CR6: The link between the data management and monitoring system and the climate change adaptation needs is unclear. How is this linked to governance? The description of the data involved is limited, and their contribution to improved coastal management is unclear. E.g., the proposal contains a photograph of a coastal road that was destroyed by a cyclone. How will in this context the proposed data component contribute to concrete adaptation capacity? Please clarify the justification for Component 2. **CR7**: Component 4 consists of developing a payment for coastal resilience mechanism, and setting-up a coastal resilience fund. The budget allocated to this component is USD 400,000, which may suffice for the actual establishment and initial operation of the structure, but it appears that it will have no funds to spend. It is unclear how the fund will be replenished or how sustainable that would be, there is one mention to a tax that may be used in this matter but no details are given. Its management and governance arrangements are vague, as is its institutional integration. It is also unclear to what extent this is aligned with government policies and budgets. Please clarify the structure and governance of the Coastal Resilience Fund, and clarify any financing commitments beyond the requested AF funding. **CR8**: Component 4 depends on the development of a national 'payment for coastal resilience' (PCR) strategy and act. The adoption of the latter is beyond control of the project (as are several elements of Component 1). The same applies to equipping the Coastal Zone Management Committee with a mandate. Please clarify how the project will achieve

		these outputs that are beyond its control, and what the alternatives are should this not be achieved.
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Unclear.** The project aims to strengthen the resilience of coastal communities and ecosystems. However, the proposal lacks details on the project beneficiaries, target areas, and specificity on how the project components lead to the indicated environmental, social, and economic benefits. The current description of benefits is generic. The benefits claimed are not directly linked to the activities and outputs of the project. For example, the benefit claimed is the reduction/ elimination of beach sand mining, but the only project output will be a strategy for that purpose. Other claimed benefits (e.g., counteraction of coral bleaching, ocean acidification, and sargassum influx resulting from sea level rise, storms, and increasing sea surface temperatures) are in no manner linked to the project outputs. Benefits are also claimed for activities that will not take place as part of the project, such as tree planting or implementing sustainable fishery practices. **CR9**: Kindly indicate the number of direct and indirect beneficiaries and disaggregate by gender and age. Also, please name the project target areas (particularly related to component 3, as the other components are national). **CR10**: The environmental benefits subsection describes multiple positive outcomes of possible measures, many unrelated to the project. Kindly revise based on the specific project activities and actions to be implemented. Please also see **CR1**.

		CR11: Please provide a nuanced explanation of how the project components will lead to social and economic benefits. **CR12**: Please clarify how the project will ensure the equitable distribution of benefits to vulnerable communities, households, and individuals. **CAR2:** Please include an initial gender analysis, including data on gender roles, activities, challenges, and opportunities related to the project. This analysis should inform the project development.
	5. Is the project / programme cost effective?	**Unclear.** The concept note is missing the section on cost-effectiveness (II.C of the project template). The combination of USPs, unclear project benefits and uncertain likelihood of success of several outputs render it impossible to appreciate the cost-effectiveness of the project at this stage. **CAR3**: Kindly include the relevant section explaining the project's cost-effectiveness in comparison to alternative options to the proposed measures.
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?	**Partially**. The concept note has outlined the project's alignment with St. Kitts and Nevis' NDC, its Climate Change Adaptation Strategy, and the Management Plan for St. Kitts and Nevis Marine Management Area. However, for a number of the project outputs, government commitment and financing are indispensable. So, while there is consistency with strategies mostly developed under external impetus, the proposal does not demonstrate consistency with actual government commitments.

		CR13: Please clarify project consistency with current government policy and budgeting.
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Unclear.** The proposal does not contain the required section. **CAR4:** Please explain how the project will comply with national technical standards that must be followed to implement project activities. Such standards may include Environmental Impact Assessments (EIAs), building codes, water quality regulations, agricultural and forest regulations, and any other sector-specific standard or regulation.
	8. Is there duplication of project / programme with other funding sources?	**Partially.** **CR14**: In section IV, please describe in detail the projects named in section III, and also include all other relevant projects that may provide key lessons to the proposed one. Then, kindly explain the lack of overlap with each project, and the potential complementarity.
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	**Unclear**. The project contains some knowledge management activities across components, with the aim of monitoring experiences and lessons. Output 3.3 is specifically dedicated to lessons learning but it is generic and limited to documenting project activities, and passively making those available through a web-based platform that typically rarely outlives the project implementation period. It is unclear what lessons the project intends to generate, what the unknowns are, and how it will be able to determine what is 'best practice'. The Theory of Change presented as Fig. 15 is unreadable. **CR15:** Although the project has indicated some aspect of knowledge management and dissemination, kindly

		explain the specific activities that will take place to gather and disseminate lessons from the project itself. Also, clarify which lessons the project intends to generate and how these will be valorised.
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**No**. The proponents have carried out an initial consultation process with some institutional stakeholders, including national representatives. It is unclear if those adequately captured essential political commitments to support the project activities. No consultations with beneficiaries and non-institutional stakeholders are reported. In line with the rest of the proposal, gender considerations are notably absent. **CR16:** Kindly include a full list of stakeholders consulted, including their organization and roles. Also, indicate the date of the meetings per stakeholder or group of stakeholders. **CR17:** Please clarify how gender considerations have been included during the consultations. Kindly summarize the key issues identified and explain how this has informed the project. **CR18**: Have marginalized and vulnerable groups been consulted? If not, carry out the required consultations and report how their views and considerations were addressed in the proposal.
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	**No**. The concept note provides a very limited explanation of the full cost of adaptation. In addition, the use of USPs renders such considerations impossible at this stage. The section of the proposal does stress that 'alternative funding options are very limited', further raising questions about the viability of

		the outputs under component 4 (Coastal Resilience Fund). **CR19:** Please further explain the full cost of adaptation. The justification should provide details on the baseline scenario, the additionality by project component, and how the requested financing is justified from this perspective.
	12. Is the project / program aligned with AF's results framework?	**Partially.** The concept note has indicated the project's alignment with several AF outcomes, including 1, 2, 3, 4, 5, 7, and 8. **CR20**: It may be advisable to focus on the most important AF outcomes related to the project, such as AF outcomes 1, 2, 5, and 7. Kindly explain the project's alignment with AF outcomes 3, 4, and 8. **CAR5:** The concept note has indicated alignment with AF outcomes in section III, however this section is only required for the full proposal. Kindly indicate alignment in Section II (pertinent to the concept note).
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	**Yes, but more information is needed**. The proposed project comprehensively addresses the vulnerability of coastal ecosystems and populations. The project aims to ensure the sustainability of its outcomes by focusing on several key dimensions, such as improving institutional coordination for coastal zone management, setting a financial mechanism that ensures long-term funding, and developing a monitoring and data analysis system. However, the paramount attention that was given to ensuring the sustainability of the project outcomes is not reflected in the proposal.

		CR21: The coastal resilience financing mechanism is the basis for a number of the sustainability claims, but the proposal does not explain how the operation of that fund will be financed or how it will be replenished. Kindly clarify. **CR22**: Given that the project will invest in coastal infrastructure, what arrangements would be set to ensure its maintenance and operability after the project finishes?
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**No.** The concept note indicates that the project is category B. The proponent has assessed the possible risks against the 15 AF principles, considering the impact of such risks, and proposed measures to address them. However, the risks identification is generic and does not reflect the actual risks. There is no justification for the use of USPs. There are few or no additional benefits to not identifying the infrastructure activities of Component 3 at this stage. **CR23**: Given that the proposal does not clearly indicate the measures under Component 3, once this is addressed, the assessment will need to be updated. Please identify the project activities to the point where adequate environmental and social risk identification is possible and update the proposal accordingly. Please see also **CR1**. **CR24:** Kindly note that risks categorized as a medium would require further assessment during the full proposal development. Kindly revise the table to indicate this in the second column. **CR25**: Kindly indicate which project components or activities would lead to the identified risks.

		CR26: An initial gender analysis is required at the concept note stage. Kindly provide it.
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	**Yes.**
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	**No.** **CR27**: The management fee ($850,000) needs to be below 8.5% of the total budget before the fee ($9,150,000). **CAR6***:* Please revise the total amount of financing required in the Project Components and Financing table, as it is now 1,000,000, and not 10,000,000 as requested. The IE and EE fees calculator available under Project Material on the AF Website can be used. https://www.adaptation-fund.org/document/ie-and-ee-fees-calculator/
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	**Yes.**
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	**Yes.**
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	n/a at concept stage

	2. Are there measures for financial and project/programme risk management?	n/a at the concept stage
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	n/a at concept stage
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage
	6. Is a detailed budget including budget notes included?	n/a at concept stage
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	n/a at concept stage
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	n/a at concept stage
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage

CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project: Coastal Adaptation and Resilience Initiative – St. Kitts and Nevis (CARI-SKN)

Country: Saint Kitts and Nevis

Thematic Focal Area: Coastal Zone Management

Type of Implementing Entity: Regional Implementing Entity

Implementing Entity: Caribbean Community Climate Change Centre (CCCCC)

Executing Entities: Ministry of Public Infrastructure et al. (GovSKN)

Amount of Financing Requested: $10,000,000.00 (in U.S Dollars Equivalent)

Project Formulation Grant Request (available to NIEs only): Yes ☐ No ☒

Amount of Requested financing for PFG: N/A

Letter of Endorsement (LOE) signed: Yes ☒ No ☐

NOTE: The LOE should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☐ This concept has been submitted before

☒ This is the first submission ever of the concept proposal

In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

Please note that concept note documents should not exceed 50 pages, including annexes.

1. Project Background and Context

1.1. Project Background

Enhancing coastal resilience stands as a top priority for the Government of Saint Kitts and Nevis (GovSKN), given the substantial portion of its population residing in coastal regions and the country's dependence on coastal ecosystems. However, implementing cost-effective climate adaptation solutions poses significant challenges due to financial constraints, limited capacity, and other barriers. In spite of these barriers, the urgency and severity of the climate crisis demands immediate action to protect lives, safeguard livelihoods, and secure the future of coastal communities. In recent years, communities in Saint Kitts and Nevis have experienced firsthand the devastating impacts of climate change, including more frequent and intense storms, rising sea levels, and increased rates of coastal erosion. Therefore, this proposed initiative endeavours to tackle the escalating vulnerability of coastal communities and ecosystems in Saint Kitts and Nevis to the adverse effects of climate change through strategic and targeted interventions. These interventions will focus on critical capacity building efforts and the institutionalization of engineering expertise required to design and implement innovative solutions at the local level.

Specifically, the project's primary objective is to demonstrate transformative adaptation measures within communities by protecting them from climate impacts that threaten their livelihoods and safety. Additionally, it aims to empower local communities by facilitating their ability to design and implement coastal projects independently through the establishment of committees and financing mechanisms. By increasing the resilience of communities and ecosystems, these interventions will enable them to adapt to climate change, ultimately enhancing their economic outlook and livelihoods.

1.2. Country Context

1.2.1. Geographical Setting and Population Demographic

Now experiencing the local consequences of a changing climate, environment, and society, Saint Kitts and Nevis confront an array of challenges amplified by their small size and geographical location. Situated in the northern region of the eastern Caribbean Sea (Figure 1), these islands are uniquely susceptible to the impacts of climate change due to their low- lying coastal areas and limited landmass. With a total landmass of 104 square kilometres and a population of approximately 53,082 (0.00068% of the total world population), the federation comprises the smallest sovereign country in the western hemisphere in terms of both size and population.[1] Despite their small size and minimal contribution to global greenhouse gas emissions, the twin island federation faces disproportionate impacts from climate change compared to larger emitters. Coastal areas, which accommodate the majority of the population and crucial infrastructure, are particularly vulnerable to rising sea levels, coastal erosion, and extreme weather events. The susceptibility to cascading impacts further exacerbates vulnerabilities, with sea-level rise intensifying coastal erosion and amplifying exposure to storm surges and flooding during extreme weather events. These interconnected risks necessitate comprehensive and multi-faceted strategies to enhance resilience and mitigate the adverse effects of climate change on the islands' communities and ecosystems.

While geographically modest in size, Saint Kitts and Nevis holds profound ecological significance, particularly in its expansive marine territories. Historically, the communities inhabiting these islands have drawn sustenance and economic viability from the diverse marine ecosystems enveloping their shores. However, these ecosystems face increasing pressures from climate change, threatening their integrity and resilience. Escalating sea surface temperatures, ocean acidification, and intensified weather phenomena collectively imperil the delicate equilibrium of marine biodiversity.

[1] First Biennial Update Report (BUR1) of the Government of St. Kitts and Nevis

Figure 1: Map of Saint Kitts and Nevis. (Socurce:www.freeworldmaps.net)

Coral reefs, pivotal in supporting both ecological resilience and economic activities such as tourism and fisheries, confront unprecedented stresses, evident in recent bleaching events and structural degradation.[2] The preservation of these natural habitats is not only vital for biodiversity conservation but also for the livelihoods and well-being of local communities who rely on ecosystem services for sustenance and economic activities such as tourism, agriculture, and fisheries. Therefore, sustainable management and conservation of these ecosystems are paramount to safeguarding the islands' ecological balance and promoting long-term resilience in the face of environmental challenges.

As the federation continues to grapple with the mounting challenges posed by climate change, their small size becomes both a defining feature and a critical vulnerability. With nowhere else to go, the islands' limited landmass magnifies the impacts of a changing climate. Now more than ever, adaptation and resilience-building efforts are imperative to safeguard the well-being of communities and preserve the ecological resources that sustain them. Proactive measures must be taken to address these interconnected risks and ensure the sustainability of Saint Kitts and Nevis for generations to come.

1.2.2. Socioeconomic Context

In addition to their size and location, several inherent features make Saint Kitts and Nevis vulnerable to the impacts of climate change. One such feature is their socio-economic dependence on key sectors that are highly sensitive to environmental changes, such as tourism, agriculture, and fisheries. Coastal areas, where the majority of these activities are concentrated, face risks from rising sea levels, coastal erosion, and extreme weather events, threatening infrastructure, livelihoods, and economic stability.

[2] OECS Climate Change Adaptation Strategy and Action Plan 2021-2026.

These sectors also rely heavily on the islands' natural resources and ecosystems, which are increasingly threatened by climate-related hazards such as rising temperatures, increased rainfall variability, and prolonged periods of drought. Disruptions to these sectors not only have immediate economic repercussions but also affect the livelihoods and well-being of local communities. The reliance on tourism leaves the country exposed to external shocks, such as natural disasters and global economic downturns, highlighting the need for diversification and resilience-building measures. Similarly, agriculture remains vital for food security and livelihoods, but climate change impacts pose challenges to productivity, exacerbating food insecurity and economic vulnerabilities. Furthermore, the islands' limited adaptive capacity, characterized by inadequate infrastructure, limited access to financial resources, and institutional constraints, exacerbates their vulnerability to climate change in a number of ways.

Limited access to financial resources hampers efforts to properly invest in climate-resilient infrastructure and technologies, leaving communities more exposed to the impacts of climate change.[3] Institutional constraints, such as fragmented governance structures and regulatory frameworks, impede coordinated and effective responses to climate change, hindering the implementation of adaptation measures and resilience-building initiatives. Fragmented governance structures, characterized by overlapping responsibilities and unclear lines of authority, result in disjointed decision-making processes and inefficient resource allocation. This fragmentation has led to duplication of efforts, conflicting priorities, and gaps in coordination among government agencies, non-governmental organizations (NGOs), and other stakeholders involved in climate action. As a result, there is a lack of coherence and synergy in the implementation of adaptation measures, making it challenging to achieve meaningful progress in building resilience at the national and community levels.

Moreover, regulatory frameworks in Saint Kitts and Nevis are not adequately tailored to address the complex and evolving challenges posed by climate change. Existing laws and policies lack specific provisions or mechanisms to support climate adaptation efforts, leaving gaps in governance and legal frameworks. Additionally, regulatory processes are known to be slow, bureaucratic, and cumbersome, hindering the timely implementation of climate-resilient projects and initiatives. This regulatory inertia has discouraged investment in climate adaptation and resilience measures, exacerbating the vulnerability of communities to climate-related risks and hazards. In addition to gaps in regulatory content, challenges related to enforcement and compliance monitoring has undermined the effectiveness of existing coastal regulations. Limited capacity and resources within regulatory agencies, coupled with insufficient stakeholder engagement and community participation, also result in weak enforcement mechanisms and a lack of accountability for non-compliance with coastal regulations.

Despite efforts to enhance resilience, the capacity to anticipate, cope with, and recover from climate-related impacts remains relatively low across Saint Kitts and Nevis. Communities lack the necessary knowledge, skills, and resources to effectively prepare for and respond to climate-related hazards, increasing their vulnerability to the adverse effects of environmental changes. Moreover, the slow pace of recovery following climate-related disasters further underscores the limitations of existing adaptive capacity, as communities struggle to rebuild infrastructure, restore livelihoods, and recover from economic losses. This lack of adaptive capacity is compounded by socio-economic disparities, with marginalized groups facing disproportionate risks and bearing the brunt of climate-related disasters. Vulnerable populations, including low-income households, women, children, and the elderly, often lack access to essential resources and services, exacerbating their susceptibility to climate impacts and hindering their ability to recover from environmental shocks. These vulnerabilities underscore the pressing necessity for precisely targeted interventions aimed at fortifying adaptive capacity.

[3] The National Climate Change Strategy for St. Kitts and Nevis, 2018

1.2.3. Gender Context

Natural hazards and climate change impact women and men differently, due to differences in societal expectations of their roles and responsibilities. A preliminary examination of the male-female distribution across sectors in St. Kitts and Nevis shows that women dominate in wholesale and retail, hotel and restaurants, financial intermediation and public administration. The tourism sector has a high concentration of women mainly in housekeeping, reception, and food and restaurant services. Construction and agriculture have greater levels of male participation. Usually, men and women in coastal communities have differences in how they earn their livelihoods. In consequence, women usually have less income, less access to credit, and limited control over their resources.[4] Studies show that the impacts of climate change often magnify existing gender inequalities. The proposed climate adaptation measures will therefore identify and address existing gender differences and ensure that women and girls, and men and boys have equal access to disaster risk reduction and environmental solutions.

A report on enhancing gender integration in the Biennial Update Report process of St. Kitts & Nevis states that an enhanced framework for gender integration across all segments of planning at the national level as well as capacity development in the areas of climate planning and gender analysis at the sectoral level is needed. Moreover, broad-based stakeholder consultation must be integrated as a standard feature of all climate processes. These engagements must not only solicit information from respondents but should inform and empower them and build a sense of ownership of the process. Equal opportunities must be created for full and fair participation of all groups of citizens in the process. The CARI-SKN project takes these recommendations into account and will develop an appropriate gender action plan to ensure taking gender differences in coastal communities adequately into account. Furthermore, the strengthening of data collection and management under Component 2 will ensure gender-disaggregated data collection to build the basis for gender-sensitive coastal zone management decision-making.

1.2.4. Development Context

In terms of development, Saint Kitts and Nevis face challenges related to limited resources, infrastructure, and institutional capacities. The islands' small size and limited landmass constrain development options and increase the pressure on coastal areas for economic activities and human settlements. Additionally, inadequate regulatory frameworks and governance structures pose challenges for integrated coastal zone management and climate adaptation efforts. Addressing these development challenges requires strategic investments in capacity building, institutional strengthening, and community empowerment to foster inclusive and sustainable development pathways that prioritize the well-being and resilience of all citizens. Climate change impacts exacerbate existing development challenges, hindering progress towards national development goals and sustainable development targets. Without effective adaptation measures and holistic development strategies, Saint Kitts and Nevis risk falling further behind in achieving socio-economic advancement and long-term prosperity. Thus, addressing the socio-economic impacts of climate change is essential for promoting inclusive growth, reducing vulnerabilities, and ensuring a resilient future for the country.

1. Climate Context and Vulnerabilities

1.1. Climatology of St. Kitts and Nevis

Located in the Caribbean's Lesser Antilles, St. Kitts and Nevis experience warm and humid conditions throughout the year, typical of countries with tropical marine climates.[5] The islands' climate is heavily influenced by the surrounding marine environment, with temperatures averaging between 26°C to 28°C during the summer months and slightly cooler temperatures ranging from 24°C to 25°C in the winter months of December to February (Figure 2). Seasonal and diurnal temperature variations are minimal, with only higher elevations experiencing occasional fluctuations below 17°C.

[4] The National Climate Change Strategy for St. Kitts and Nevis, 2018

[5] First Biennial Update Report (BUR1) of the Government of St. Kitts and Nevis

Both islands have distinct wet and dry seasons, with the wet season typically lasting from July to December, coinciding with the North Atlantic hurricane season. During this period, the islands receive substantial rainfall, with monthly averages ranging from 150 to 250 mm. Conversely, the drier season occurs from January to April. Mean annual precipitation on Nevis averages about 1170 mm, while in St. Kitts, rainfall patterns are strongly influenced by altitude. The central mountain range in St. Kitts receives an annual average of 2,500 to 4,000 mm in rainfall, whereas coastal areas experience a more modest annual average of 1,016 mm. Along the South-East Peninsula (SEP) of St. Kitts, mean annual precipitation varies from 990 mm on peaks to 864 mm at Cockleshell Bay.

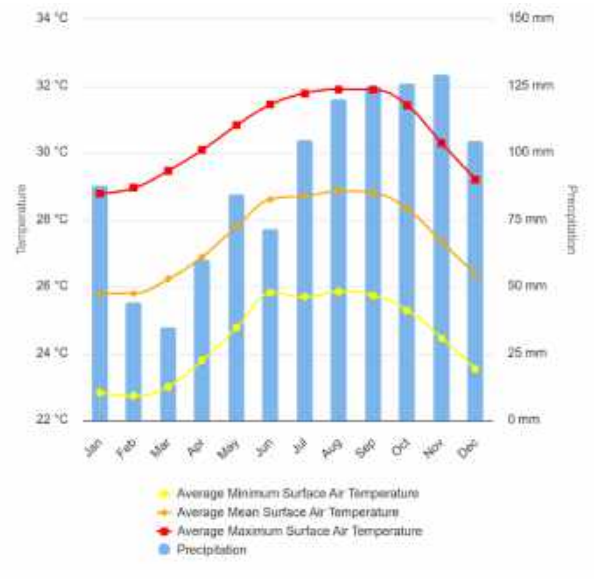

Figure 2: Monthly climatology of Average Minimum Surface Air Temperature, Average Mean Surface Air temperature, Average Maximum Surface Ait Temperature & Precipitation in St. Kitts and Nevis spanning 1991-2020. (Source: World Bank Climate Knowledge Portal)

The prevailing wind on both islands is the north-east trade with mean speeds ranging from 10-20 miles per hour 23 (mph). The periods of seasonal low-pressure July - September have higher wind speeds of 20-30 mph. The regional pattern is locally modified by land and sea breezes. The hurricane season extends from June to November, and there is a high annual frequency of tropical disturbances which generate squalls and high wind velocities.[6]

1.2. Climate change Vulnerabilities

Saint Kitts and Nevis face a multitude of climate change challenges that pose significant threats to the islands' environment, economy, and societal well-being. The islands' vulnerability to climate change is exacerbated by their small size, low-lying coastal geography, and dependence on natural resources. Key challenges include:

1.2.1. Temperature

In recent years, St. Kitts and Nevis have witnessed notable increases in the average mean temperature, reflective of broader global trends attributed to climate change. While the islands' average temperatures have remained relatively stable overall, with temperatures differing by only 3 - 5°C, there has been a discernible uptick in temperature extremes and heatwaves, particularly during the summer months.

[6] Updated Nationally Determined Contribution for St. Christopher and Nevis, 2021

These periods of intensified heat pose significant challenges to the islands' residents, infrastructure, and ecosystems, exacerbating heat-related health risks and straining energy resources for cooling.

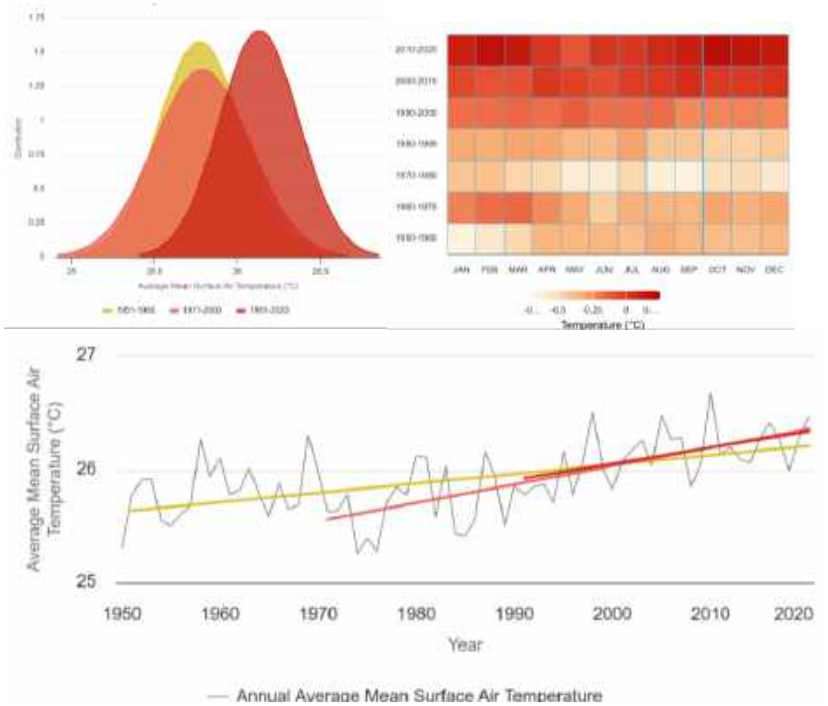

Figure 3: (i) Change in distribution of average mean surface air temperature, (ii) Changes in Average surface Air Temperature Anomaly, and (iii) Observed variation in Average surface Air Temperature in St. Kitts and Nevis, 1950-2020. (Source: World Bank Climate Knowledge Portal)

Moreover, temperature projections indicate a concerning trajectory of rising mean temperatures, with estimates suggesting that by 2100, the mean temperature could increase by approximately 3°C relative to historical averages (Figure 4). Such increases in temperature could have far-reaching implications for the islands' environment and society, impacting various sectors such as agriculture, water resources, tourism, and public health.

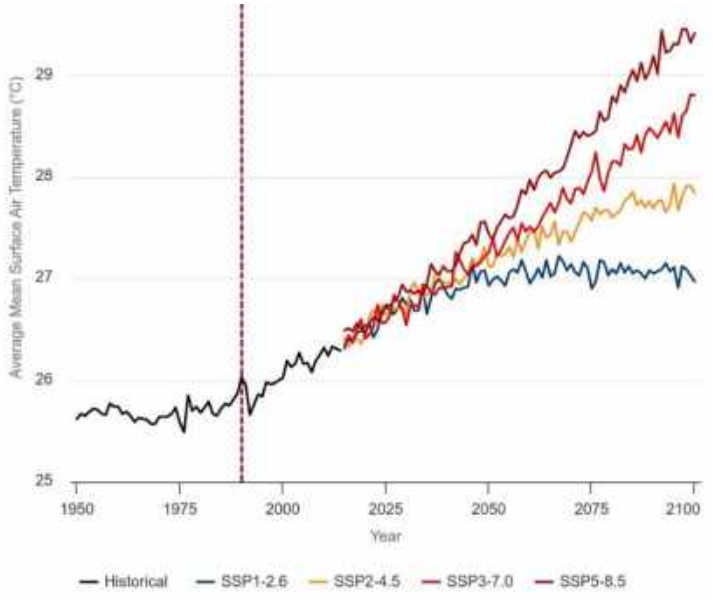

Figure 4: Projected Average Mean Surface Air Temperature St. Kitts and Nevis, Ref. Period: 1995-2014. (Source: World Bank Climate Knowledge Portal)

1.2.2. Rainfall

In recent years, St. Kitts and Nevis have witnessed significant shifts in precipitation patterns (Figure 5), indicative of the increasingly unpredictable nature of rainfall in the region, which is largely attributed to the influence of climate change. These changes include irregular rainfall patterns and more frequent extreme weather events, disrupting the islands' historically distinct wet and dry seasons. During the wet season, typically from July to December, heavier and more erratic rainfall has led to increased risks of flash floods, landslides, and soil erosion. Conversely, the drier season, from January to April, has become more unpredictable, with periods of prolonged drought interspersed with sporadic rainfall. Such alterations in precipitation dynamics have far-reaching implications for water resources, agriculture, and ecosystems, affecting crop yields, food security, and freshwater availability.

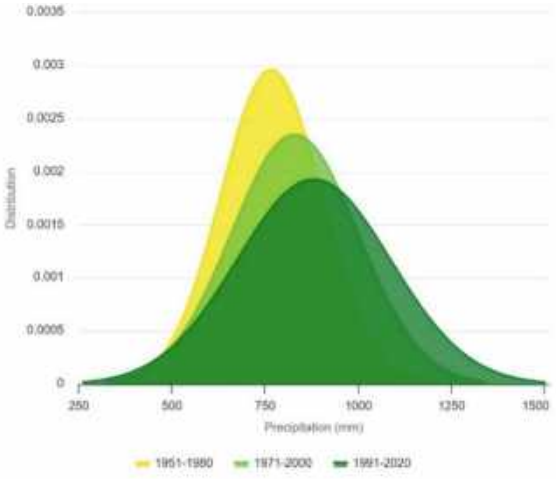

Figure 5: Change in distribution of average annual mean precipitation in St. Kitts and Nevis. (Source: World Bank Climate Knowledge Portal)

Looking ahead, climate models project further alterations in precipitation regimes for St. Kitts and Nevis, with potentially significant implications for the islands' environment and society. Future projections indicate a continuation of the trend towards more intense rainfall events, accompanied by longer dry spells and periods of drought. However, alongside increased variability, projections also suggest a general decline in annual precipitation levels (Figure 6). This overall decrease in precipitation could exacerbate challenges related to water scarcity and agricultural productivity, further straining water resources and heightening the risk of drought-induced crop failures. Moreover, the intensification of rainfall events increases the potential for flash floods, posing additional risks to infrastructure, livelihoods, and public safety.

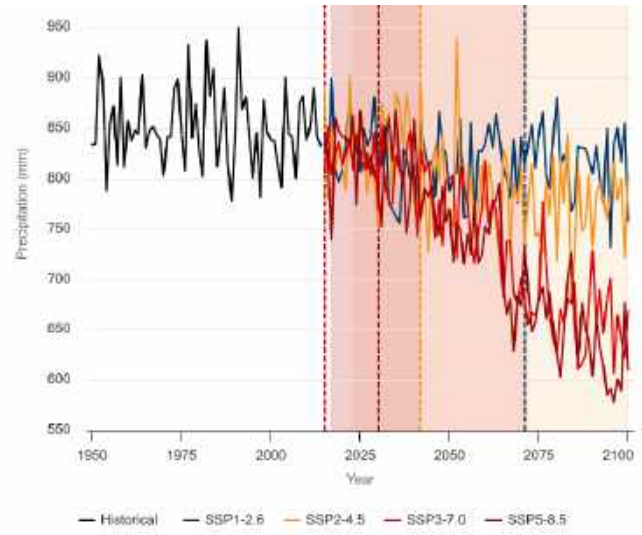

Figure 6: Projected departure from natural variability of precipitation in St. Kitts and Nevis. (Source: World Bank Climate Knowledge Portal)

Furthermore, several studies suggest that increasing evapotranspiration related to global warming leads to an increase in drought severity. This has already been recorded in the last decade. Drier conditions for the entire Caribbean region will more significantly and severely impact the Lesser Antilles. Model projections indicate an overall decrease in annual rainfall in St. Kitts and Nevis, ranging from 3% - 48% during the 21st century, with significant reductions in the wet season from May to November under all scenarios.[7] Also, small to large increases in consecutive dry days are expected. The very low annual rainfall in combination with high evapotranspiration leads to overall drying across all four seasons in the latter half of the century. Such projections raise concerns in the country, as St. Kitts and Nevis is already among the world's top water-stressed countries.

1.2.3. Tropical Cyclones

Tropical cyclones, commonly referred to as hurricanes in the Caribbean, have played a significant role in shaping the history and landscape of the region. Due to its geographical location in the Atlantic hurricane belt, St. Kitts and Nevis experience a high annual frequency of tropical disturbances from June to November. These weather phenomena bring squalls, high wind velocities, heavy rainfall, and the potential for increased costal erosion and flash floods, posing significant threats to the islands' densely populated coastline and economy.

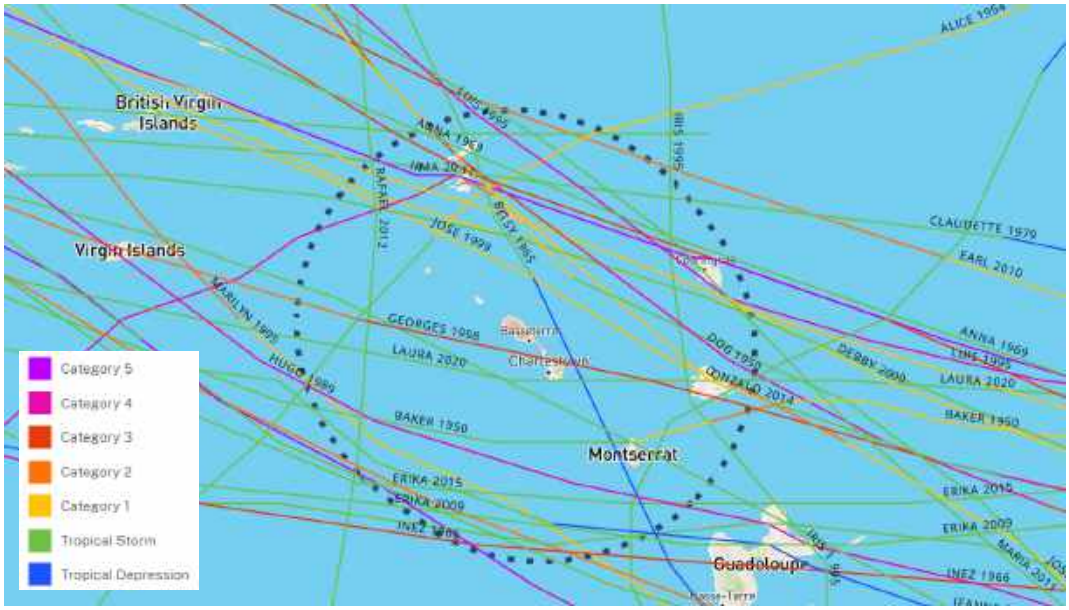

Figure 7: Tropical Cyclone and Hurricane tracks within 60 nautical miles of Saint Kitts and Nevis from 1970 – 2022. (Source: NOAA, Historical Hurricane Tracks)

Over the years, St. Kitts and Nevis have experienced a number of devastating cyclones, with notable events etched into the collective memory of their residents. Historical records document the impacts of powerful storms, such as Hurricane Hugo in 1989, Hurricanes Luis and Marilyn in 1995, Hurricane Georges in 1998 and more recent events like Hurricanes Irma and Maria in 2017 (Figure 7), which inflicted substantial damage to infrastructure and property.[8] Given the islands' heavy reliance on tourism and their densely populated coastal areas, the socio-economic implications of these events were profound (Table 1). Specifically, the destruction of infrastructure, disruption of tourism activities, and loss of livelihoods following cyclones and hurricanes posed significant challenges to the islands' economic stability and social well-being. Therefore, these events serve as stark reminders of the vulnerability of St. Kitts and Nevis to the destructive forces of nature and underscore the importance of preparedness and resilience-building efforts in the face of future cyclonic threats.

[7] Climate Trends and Projections for the OECS Region, 2021

[8] First Biennial Update Report (BUR1) of the Government of St. Kitts and Nevis

Table 1: Economic damage of the last three major Hurricanes in St. Kitts and Nevis

Year	Name	Estimated Damage
2017	Hurricane Irma	USD 53,2M
2017	Hurricane Maria	USD 4,4M
2010	Hurricane Earl	USD 8M

Source: St. Kitts and Nevis various Hurricane Damage Reports

Additionally, there has been a notable increase in the number of tropical cyclones passing through the North Atlantic Basin each year as a result of climate change, further highlighting the urgency of enhancing coastal resilience in the region (Figure 8).

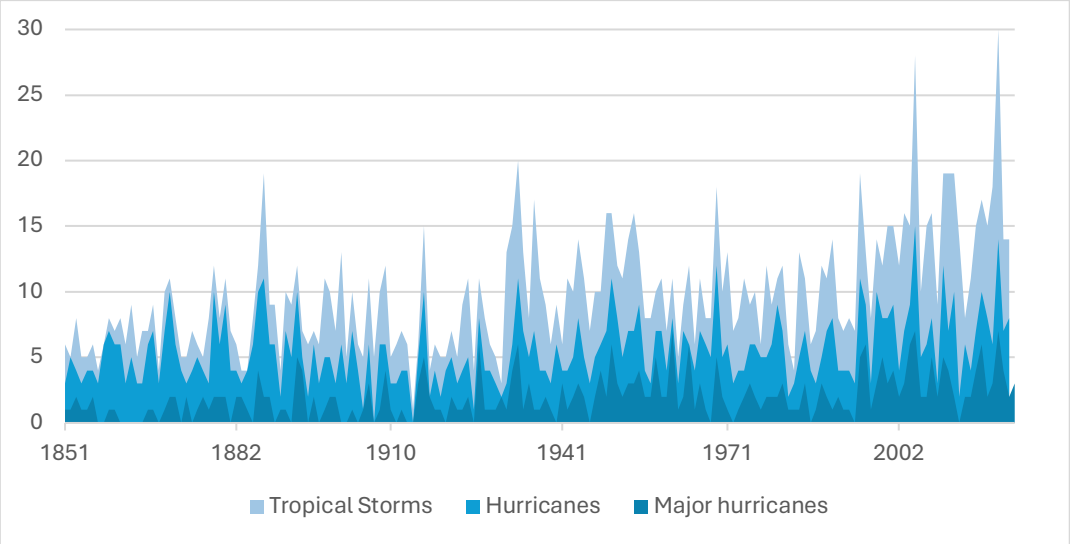

Figure 8: Total Number of Tropical Cyclones, Hurricanes, and Major Hurricanes Passing Through the North Atlantic Basin (1851-2022)

Climate projections paint a concerning picture for the future of tropical cyclones in the region. With the continued warming of the Earth's atmosphere and oceans, research suggests further variations in the frequency, intensity, and tracks of hurricanes affecting St. Kitts and Nevis. Models indicate an increase in the number of intense hurricanes, with higher wind speeds and heavier rainfall, posing heightened risks of storm surges, flooding, and coastal erosion.[9] Furthermore, rising sea levels exacerbate the impacts of cyclones, amplifying the threat of inundation to low-lying coastal areas and critical infrastructure. These projections highlight the urgent need for proactive measures to strengthen resilience and adaptive capacities, including improved early warning systems, robust infrastructure investments, and community-based disaster preparedness initiatives.

1.2.4. Sea level rise

Projected sea level rise is a grave concern for Saint Kitts and Nevis and the wider Caribbean region. By 2018, sea levels had already risen by approximately 0.08 meters, leading to the loss of a substantial portion of the country's land area since 1961. By 2032, the World Bank projects sea level rise of between 0.12 and 0.19 meters, increasing to 0.20 to 0.31 meters by 2050 (Figure 9). By the end of the century, projections diverge substantially based on expected greenhouse gas emissions, with the IPCC's intermediate scenario (RCP 4.5) projecting between 0.49 to 0.63 meters of sea level rise.[10]

[9] Climate Trends and Projections for the OECS Region, 2021

[10] Climate Change Knowledge Portal (World Bank), 2024

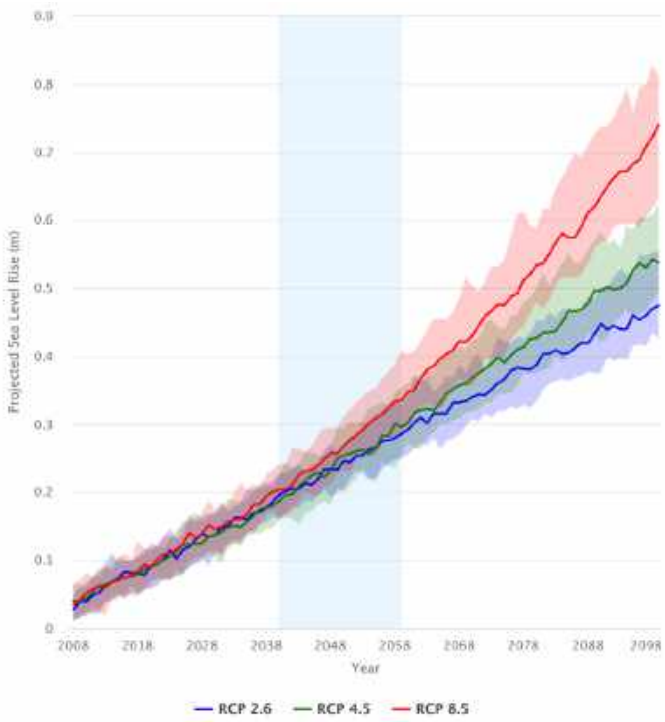

Figure 9: Projected Sea Level Rise along the coast of St. Kitts and Nevis under different scenarios. (Source: World Bank Climate Knowledge Portal)

This anticipated sea level rise is likely to exacerbate the risk of coastal flooding, particularly in areas already at higher risk. Additionally, coastal erosion, already assessed as a medium-high risk, is expected to intensify, posing further threats to infrastructure and coastal communities. Therefore, urgent action is needed to implement adaptive measures, including coastal protection strategies, sustainable land use planning, and the development of resilient infrastructure, to mitigate the impacts of sea level rise and safeguard the future of St. Kitts and Nevis' coastal communities.

Furthermore, the impacts of sea level rise extend beyond the immediate coastal zones, with ripple effects felt across various sectors of the economy and the natural environment. In addition to exacerbating coastal erosion and flooding, higher sea levels can disrupt ecosystems, leading to habitat loss and degradation of critical coastal ecosystems such as mangroves and coral reefs. Such ecological disruptions have far-reaching consequences, affecting fisheries, biodiversity, and the overall resilience of coastal ecosystems. Addressing the challenges posed by sea level rise requires integrated coastal management strategies, including shoreline protection measures, sustainable land use planning, and efforts to reduce greenhouse gas emissions to mitigate further warming and sea level rise.

1.2.5. Sea Surface Temperature

Sea surface temperatures (SSTs) in the Caribbean are integral to the region's climate and play a vital role in maintaining the health of marine ecosystems. Over the past century, the entire northern tropics, including the wider Caribbean region spanning from 5° to 35°N and 100° to 55°W, have experienced a notable warming trend (Figure 10). Specifically, the SSTs in the Antilles, encompassing the insular countries of the Caribbean (including St. Kitts and Nevis), have shown a slightly higher increase compared to the wider region, with an average rise of approximately 1.32°C per century.[11] This upward trend in SSTs has significant implications for the climate, marine biodiversity, and weather patterns across the Caribbean.

Projections for future SST trends indicate further warming in the region, with potential impacts on hurricane intensities, coral reefs, and other marine ecosystems. Under scenarios representing different levels of CO_2 emissions, future SST trends in the Antilles and the wider Caribbean are expected to

[11] Impacts of Climate Change on Sea Temperature in the Coastal and Marine Environments of Caribbean Small Island Developing States (SIDS)

range between 0.39 and 2.21°C per century. By mid-century, it is projected that the Caribbean Sea will experience uniformly warm temperatures throughout the year, with SSTs exceeding 28°C across the entire region under higher emissions scenarios. These rising SSTs pose challenges for the resilience of marine ecosystems and coastal communities, as warmer waters can exacerbate coral bleaching events, alter the distribution of marine species, and fuel the intensity of tropical storms and hurricanes.

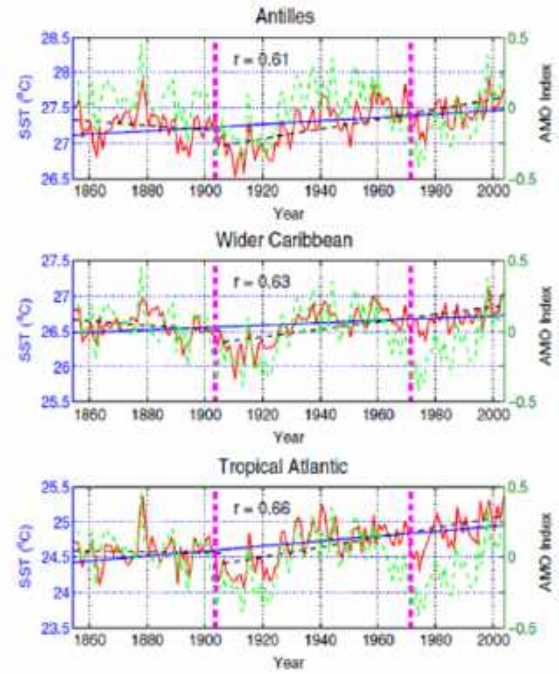

Figure 10: *Annual area average of SST from observations for three tropical north Atlantic regions for the period 1854-2005.*

In the context of St. Kitts and Nevis, these changing SSTs present specific challenges in the near future. The islands' coastal communities rely heavily on marine resources for sustenance and economic livelihoods, including fishing and tourism. Warmer waters can disrupt these ecosystems, leading to declines in fish populations, coral reef degradation, and diminished tourist attractions such as vibrant coral reefs and diverse marine life. In addition, the increased intensity of tropical storms and hurricanes fuelled by warmer SSTs poses heightened risks of coastal erosion, flooding, and infrastructure damage, exacerbating the vulnerability of the small island nation to climate-related disasters. Addressing these challenges requires coordinated efforts to enhance marine conservation, strengthen coastal resilience, and adapt to the changing climate in St. Kitts and Nevis.

2. Vulnerability of Coastal Communities and Ecosystems

2.1. Coastal Communities

Coastal communities in Saint Kitts and Nevis, situated at the intersection of human habitation and natural forces, confront a myriad of challenges that stem from their geographical context, socio-economic dynamics, and the escalating impacts of climate change. Nestled along the shores of both islands, these communities find themselves on the front lines of environmental change, facing heightened risks from rising sea levels, coastal erosion, and increasingly frequent and intense extreme weather events. With over 60% of the total population residing in coastal areas, the vulnerability of these communities stands as a critical concern that demands immediate attention and targeted interventions (Figure 11).[12]

[12] Updated Nationally Determined Contribution for St. Christopher and Nevis, 2021

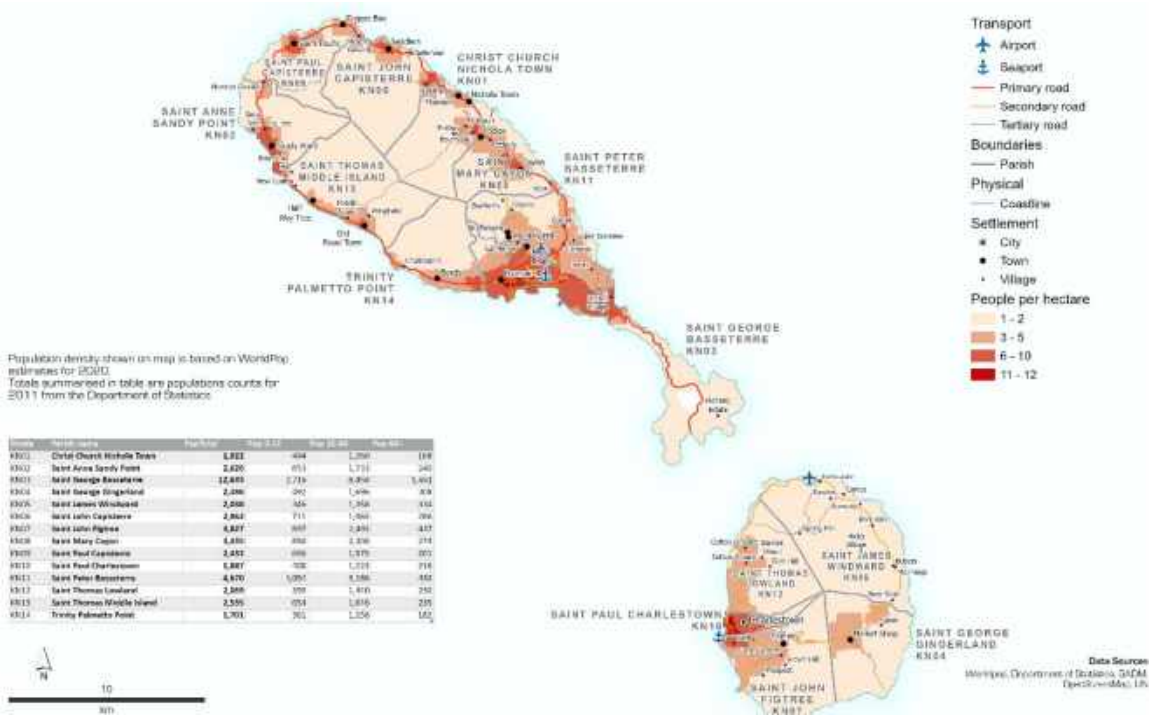

Figure 11: Population Density map for St. Kitts and Nevis.

Recent data underscores the profound vulnerability of coastal settlements in Saint Kitts and Nevis. These communities, characterized by bustling urban centres, informal housing, and essential infrastructure, are acutely exposed to the perils of climate-related hazards. Basseterre, the capital of and largest city in St. Kitts and Nevis, is home to approximately 14,000 people, constituting about 27% of the country's population.[13] Despite projections indicating that the total population may not experience significant growth, there is an anticipated increase in urban population from 32.9% in 2020 to 45.5% in 2050 (Table 2).[14] Furthermore, the proportion of the workforce employed in vulnerable sectors is expected to rise significantly over time. With these increases, the number of individuals at risk is likely to rise, necessitating concerted efforts to address the challenges posed by urbanization and coastal vulnerability in tandem. Specifically, the encroachment of rising sea levels and the menace of coastal flooding and erosion loom large, posing imminent threats to housing security, public health, and economic stability. The repercussions of such environmental pressures reverberate deeply, amplifying social disparities and exacerbating the vulnerability of marginalized groups within these coastal enclaves. Moreover, the reliance of coastal communities on marine and coastal resources for sustenance further heightens their susceptibility to environmental degradation and habitat loss, with the degradation of coral reefs and coastal ecosystems jeopardizing the very foundations of livelihoods dependent on fisheries, tourism, and agriculture.

Year	*Population*	*Yearly Change (%)*	*Yearly Change*	*Density (P/Km²)*	*Urban Population*	*Urban Population*
2020	53190	0.77	399	205	32.9	17523
2025	54740	0.57	308	211	33.8	18481
2030	55830	0.4	218	215	35.2	19645
2035	56490	0.23	132	217	37.2	21042
2040	56730	0.08	48	218	39.9	22617
2045	56610	-0.04	-24	218	42.6	24135
2050	56160	-0.16	-90	216	45.5	25561

[13] Urban Resilience Plan for Greater Basseterre, 2022

[14] First Biennial Update Report (BUR1) of the Government of St. Kitts and Nevis

Table2: *Projected Changes in Urban Dynamics in St. Kitts and Nevis: 2020-2050. (Source:*

Beyond environmental stressors, the vulnerability of coastal communities is compounded by socio-economic inequities which exacerbate the challenges they face in adapting to the impacts of climate change. Poverty, unemployment, inadequate access to healthcare and education, and deficiencies in basic infrastructure deepen the vulnerabilities of coastal residents, impeding their capacity to withstand and recover from climate-related disasters. Vulnerable groups, including women, children, the elderly, and persons with disabilities, bear the brunt of these challenges, grappling with heightened risks of displacement, food insecurity, and loss of income. Historically, the absence of comprehensive risk assessment and early warning systems has left coastal communities vulnerable to the capricious nature of climate hazards, underscoring the urgent imperative for proactive measures and community-driven resilience strategies. Nonetheless, in recent years the government of St. Kitts and Nevis has demonstrated a proactive stance in assessing the nation's vulnerability to climate change impacts. Several projects have been undertaken to evaluate coastal vulnerability, such as the Assessment of the Economic Impact of Climate Change on the Coastal and Marine Sector in the Saint Kitts and Nevis[15], the Multi-hazard Risk Assessment for St. Kitts and Nevis[16], the Climate and Ocean Risk Vulnerability Index (CORVI) Project[17], and the Report of the vulnerability and capacity assessments in coastal and fishing communities in Saint Kitts and Nevis[18]. These comprehensive reports have not only provided crucial insights but have also spurred tangible actions on the ground. Initiatives such as the Rehabilitation of Old Road Bay Road (Figure 12), the Coastal Erosion Mitigation Project at South Frigate and Friars Bay, the Rehabilitation of Old Road Fisheries Complex, and the Construction of Coastal Area Revetments in Irishtown, Fortlands and New Guinea, underscore the government's commitment to addressing urgent coastal concerns.

[15] https://www.cepal.org/en/publications/38607-assessment-economic-impact-climate-change-coastal-and-marine-sector-saint-kitts

[16] https://ceac.preview.com.jm/projects/st-kitts-multi-hazard-risk-assessment/

[17] https://www.stimson.org/2022/corvi-risk-profile-basseterre-st-kitts-and nevis/#:~:text=https%3A%2F%2Fwww.statista.com,to%200.20%20to%200.31%20meters.

[18] https://canari.org/wp-content/uploads/2022/08/CC4FISH-St-Kitts-Nevis-VCA-Report.pdf

Figure 12: *A.) Damaged main road in Old Road Bay after the passage of Hurricane Maria in 2017, B.) Repaired Road in Old Road Bay in 2021, showcasing post-disaster recovery efforts.*

These initiatives signify significant strides toward bolstering coastal resilience and mitigating vulnerability to climate-related hazards in St. Kitts and Nevis. Through meticulous risk assessments and targeted interventions, the government endeavours to shield coastal communities, critical infrastructure, and natural resources from the adverse impacts of climate change. Additionally, these endeavours underscore the imperative of integrating climate adaptation measures into national development strategies and fostering collaborative partnerships among stakeholders to ensure sustainable and inclusive outcomes for all segments of society. Nevertheless, despite these interventions, additional financial support is indispensable to mount a more comprehensive response to the prevailing challenges. Thus, it is only through sustained investment in adaptation strategies and community-driven resilience-building initiatives that St. Kitts and Nevis can effectively confront the risks posed by climate change and pave the way for a more resilient and sustainable future for its populace.

2.2. Coastal Ecosystems

Coastal and marine ecosystems in St. Kitts and Nevis are integral for the sustainable development of the nation, particularly in supporting the tourism and fisheries sectors. However, these ecosystems face significant risks from climate change, including sea level rise, extreme weather events, and storm surges, as well as the compounding effects of increased sea surface temperatures leading to coral bleaching, ocean acidification, and sargassum influx. Such impacts threaten the health and resilience of these ecosystems, with potentially far-reaching consequences for biodiversity, ecosystem services, and the livelihoods of coastal communities. The Climate and Ocean Risk Vulnerability Index (CORVI) conducted for Basseterre underscores the heightened ecological risk faced by coastal communities.[19] It highlights declining coverage and health of key coastal ecosystems, including mangroves, coastal sand dunes, coral reefs, and seagrasses. The medium-high risk score for the rate of occurrence of harmful algal blooms further accentuates additional risks to the ecosystem. These findings emphasize the urgent need for targeted interventions and adaptive strategies to safeguard coastal ecosystems and the invaluable services they provide. Moreover, it underscores the necessity for proactive measures to mitigate the impacts of climate change and enhance the resilience of coastal communities in St. Kitts and Nevis.

Model projections, such as those from the Hadley Centre coupled model (HadCM2), suggest a concerning outlook for the future productivity of coastal and marine ecosystems in St. Kitts and Nevis.

[19] https://www.stimson.org/2022/corvi-risk-profile-basseterre-st-kitts-and-nevis/#:~:text=https%3A%2F%2Fwww.statista.com,to%200.20%20to%200.31%20meters.

These projections indicate a potential decrease in productivity across various key ecosystems, including coral reefs, fisheries, and wetlands. Such declines could have far-reaching consequences, particularly concerning food supply and associated livelihoods, as they are driven by factors such as declining nearshore and deepwater fish stocks and the diminishing benefits from unsustainable fishing practices. The absence of seagrass in seafloor areas renders them more vulnerable to wave action from currents and storms, leading to increased coastal erosion. Seagrasses play a crucial role in stabilizing substrates, akin to land grasses preventing soil erosion on land, and their decline could exacerbate the loss of coastal landmass. Additionally, a report from the Food and Agriculture Organization (FAO) highlights that severe coastal erosion from storm surges and strong ocean currents are a key issue leading to siltation of and the decline in the health of the adjacent coral reefs. These unique coral reef ecosystems serve as a key resource for local fishing communities and also stabilise the coastlines of both islands. Therefore, the interconnected web of ecological degradation underscores the urgent need for proactive measures to mitigate the impacts of climate change and safeguard the sustainability of coastal and marine ecosystems in St. Kitts and Nevis. Efforts to promote sustainable fishing practices, enhance marine conservation, and implement coastal protection measures are imperative to address these emerging challenges and ensure the resilience and viability of coastal communities in the face of ongoing environmental changes. Furthermore, changing ecosystems are expected to impact marine species populations, with vulnerable and endangered coastal and marine species facing heightened risks due to habitat loss. Invasive species such as the Lionfish (Pterois spp.) and halophila stiplacea have proliferated in response to changing environmental conditions, further altering ecosystem dynamics. With majority of the population residing in coastal areas, the threats to coastal ecosystems directly affect the well-being and livelihoods of a significant portion of the island's population. By 2050, estimated losses from the effect of SLR and coral reef decline on coastal lands is projected to amount to between USD 832 – 1 026.4 million.[20] Therefore, urgent action is needed to protect and restore coastal and marine ecosystems in St. Kitts and Nevis, safeguarding their invaluable ecological services and ensuring the resilience of both ecosystems and communities in the face of climate change.

In response to current challenges, the government of St. Kitts and Nevis is already in the process of implementing a statutory marine zoning framework, which can be viewed as a solid foundation from which to develop a more comprehensive approach to the management of coastal and marine environments. From this plan, approximate coastal zones could already be identified and key hot spots resulting from human interaction with the natural environment mapped (Figure 13). However, further work needs to be conducted to enhance the country's understanding of coastal and marine climate vulnerabilities. This includes comprehensive mapping efforts to identify areas of environmental sensitivity and potential growth, taking into account the impacts of climate change.[21] For example, the update of coastal zone and marine habitats should encompass a benthic survey of both coastlines.

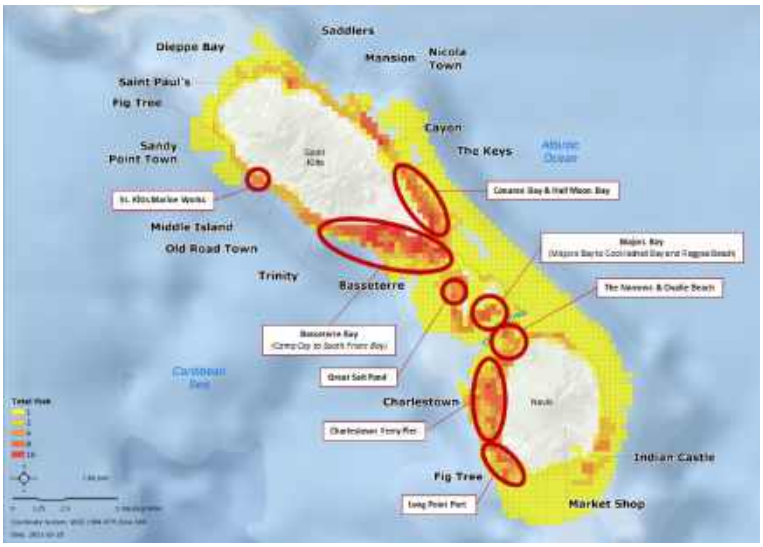

Figure 13: Key hot spots in St. Kitts and Nevis of human interaction with the natural environment.

[20] Report of the vulnerability and capacity assessments in coastal and fishing communities in Saint Kitts and Nevis

[21] Assessment of the Economic Impact of Climate Change on the Coastal and Marine Sector in the Saint Kitts and Nevis

Currently, there is limited data on the condition of the coastline, particularly with respect to nearshore and onshore activities. By conducting a thorough benthic survey, the country can establish a baseline dataset for comparative analysis with data collected through regular monitoring. This baseline data will serve as a valuable tool for informing regulatory policies and monitoring decisions related to coastal activities, ultimately contributing to more effective management and protection of coastal resources. There is also a need to focus on zoning and management to build the resilience of coastal and marine ecosystems and associated livelihoods to climate change disasters. Although substantive work has already been done, delineation of coastal zones (Figure 14) needs to be updated using pre-defined criteria and characteristics associated with habitat type and geography, biodiversity, climate vulnerabilities, and economic and social activity (industrial, tourism-related, fishing and agricultural activities as well as residential areas).

Moreover, the application of the Ecosystem-Based Management - Driver, Pressure, State, Ecosystem, Response (EBM-DPSER) analytical framework, specifically designed for the Caribbean region, needs to be increasingly utilized to better understand the complex relationships within our marine environment. By leveraging this analytical framework, the country can gain deeper insights into the drivers and pressures affecting coastal and marine ecosystems, as well as their current state and potential responses to management interventions. This will enable more informed decision-making and improved management practices, ultimately enhancing the government's ability to address the challenges posed by climate change and promote the resilience of our coastal and marine environments.

Although the government of St. Kitts and Nevis has proposed and passed several plans and projects for strengthening climate resilience, a lack of funding and inadequate technical and human resources have hindered effective implementation. Addressing these challenges will position local decision-makers well to provide leadership on climate change, mitigate the threats posed by climate and ocean risks and build a resilient and sustainable future.

Figure 14: Marine zoning in the Nearshore Coastal Area.

3. Project Rationale and Justification

The rationale for undertaking comprehensive climate adaptation measures in Saint Kitts and Nevis is rooted in the imperative to safeguard lives, protect livelihoods, and preserve the islands' natural and cultural heritage in the face of escalating climate change impacts. The vulnerability of coastal communities underscores the urgent need for proactive interventions aimed at enhancing resilience, reducing risks, and fostering sustainable development pathways. By addressing the root causes of vulnerability and building adaptive capacities, this project seeks to mitigate the adverse effects of climate change while promoting inclusive and sustainable development for all inhabitants of Saint Kitts and Nevis.

The justification for prioritizing this project over others in the region lies in the unique socio-economic and environmental context of Saint Kitts and Nevis, coupled with the pressing need to address climate change impacts in a holistic and integrated manner. The islands' small size limited natural resources, and dependence on vulnerable coastal ecosystems render them particularly susceptible to the impacts of sea-level rise, coastal erosion, and extreme weather events. Furthermore, the socio-economic disparities and institutional constraints facing coastal communities exacerbate their vulnerability, underscoring the urgency of targeted interventions to build resilience and enhance adaptive capacities.

Moreover, investing in climate adaptation in Saint Kitts and Nevis aligns with international commitments to address climate change and advance the Sustainable Development Goals (SDGs). By integrating climate adaptation into national development planning, Saint Kitts and Nevis can strengthen its resilience to climate change impacts, reduce disaster risks, and promote sustainable development outcomes. Furthermore, by demonstrating leadership and innovation in climate adaptation, Saint Kitts and Nevis can serve as a model for other small island developing states (SIDS) facing similar challenges, showcasing best practices and lessons learned that can inform global efforts to build climate resilience and achieve sustainable development in the face of a changing climate.

4. Barriers and Root Causes Addressed by the Project

4.1 . Regulatory Barriers: Blue Economy Consistent Plans, Policies and Regulations

As stated in several policy documents, such as the Management Plan for St. Kitts and Nevis Marine Management Area, the regulatory and political framework in St. Kitts and Nevis (SKN) lacks a consequent mainstreaming of coastal zone management and climate change adaptation into policies and regulations as well as the sufficient promotion of a Blue Economy and ecosystem-based adaptation (EBA) approach. Activities that support coastal zone management and strengthen the resilience of coastal areas require comprehensive and complementary strategies, plans, and regulations. In this regard, the regulatory framework requires the update and revision of several policies as well as lacks key strategies, such as a Blue Economy strategy and action plan, a strategic approach to coastal erosion and siltation, and an integrated coastal zone management policy.

4.2. Institutional Barriers: Capacities and Coordination

The barrier analysis showed that coordination and capacity for coastal zone management are limited among government agencies. The limited alignment of Blue and Green Economy approaches, including the lack of needed shared resources at the ministerial and department level, hinders the effective integration of climate change, ecosystem-based adaptation, and disaster risk reduction considerations into legislation, regulations, and policies. Moreover, according to the country's recently updated Nationally Determined Contributions (NDC), less than 50% of the adaptation actions identified in key parts for coastal resilience of the National Climate Change Adaptation Strategy have been integrated into annual operational plans or have been implemented. Despite financial shortcomings, this is also due to a lack of human resources to implement identified adaptation actions and a lack of a dedicated management regime that regulates and monitors activities and enforces rules and regulations. Particularly the Department of Environment in St. Kitts and the Department of Physical Planning and Environment in Nevis lack adequate capacities to track the results of implemented adaptation measures.

4.3. Technological Barriers: Data management and Monitoring

The backbone of a sufficient policy environment and enforcement are data availability and analysis. SKN has limited data to gain a clear understanding of the impacts of climate change and potential adaptation strategies and lacks a database to strengthen mapping mechanisms for coastal vulnerabilities. The Government of St. Kitts and Nevis (GovSKN) further needs to enhance the linkage of national data collection with regional platforms, like the Biodiversity and Protected Areas Management Regional Information System to enhance data and information availability. On top of that, the country lacks comprehensive systems to monitor national ecosystems and climate impacts, e.g. regarding, beach erosion, and post-storm monitoring. (expound)

4.4. Financial Barriers: Planning Tools and Concessional Finance

For adequately addressing the vulnerabilities outlined previously, SKN lacks the financial resources to implement adaptation actions. For mobilizing capital for climate action, including the engagement of the private sector and alignment of private and public sector resources, SKN lacks structured investment planning tools. In this regard, missing financial instruments, the lack of information on the risk of climate change as well as missing data and rank mechanisms of sustainable investments, hinder the implementation of coastal protection measures and the financing of physical infrastructure. New funding structures, including concessional finance to reduce the risk of investments, and innovative collaborative partnerships are key for the country to finance adaptation measures.

4.4. Social Barriers: Lack of Awareness and Engagement

Communication and awareness about vulnerabilities, needs and approaches of coastal zone management are key to enhancing the effectiveness of adaptation measures. The country lacks the engagement of key stakeholders for coastal zone management, including Blue Economy and ecosystem-based adaptation solutions. Furthermore, the public lack of awareness and access to insurance and other disaster risk reduction measures. Furthermore, education and awareness of coastal communities, especially of poorer communities who depend on ecosystem services for sustenance and livelihood is insufficient. Moreover, while GovSKN has an Early Warning System for disaster risk management in place, a sufficient notification system for the public, specifically recognised vulnerable groups is missing.

5. Project Objectives

List the main objectives of the project.

Considering the climate change-related challenges and vulnerabilities that St. Kitts and Nevis is facing, the objective of CARI-SKN is to develop a coastal zone management framework for St. Kitts and Nevis that is responsive to current and future climatic chnages. This framework aims to facilitate the financing of critical coastal resilient infrastructure and implement measures for the protection of coastal ecosystems which will ultimately enhance climate adaptation efforts. This shall be achieved by removing key barriers that impede the structured identification, planning, financing, and implementation of needed coastal resilience infrastructure. Such coastal adaptation measures shall be well integrated into national legislation and in line with concepts such as the blue economy, ecosystem-based adaptation, and ridge-to-reef.

To comprehensively remove barriers, create an enabling policy environment for coastal resilience measures, and address key coastal climate vulnerabilities, the CARI-SKN project comprises four components:

- **Component 1** implements activities that strengthen the regulatory and political framework for integrated coastal zone management, through building capacities among government agencies, enhancing intergovernmental coordination and stakeholder dialogues, and mainstreaming climate adaptation into legislation.

- **Component 2** then strengthens data management and monitoring systems by establishing comprehensive mapping and monitoring of coastal vulnerabilities as well as the analysis of coastal adaptation and climate resilience needs.

- **Component 3** builds on the results of Component 1+2 and effectively i) operationalises the work of the Coastal Zone Management Committee and ii) implements a priority coastal resilient infrastructure and coastal ecosystem protection project intervention.

- **Component 4** establishes a sustainable financing mechanism, namely the Coastal Resilience Fund, to support the maintenance and potential financing of coastal resilience measures, thereby enhancing the long-term climate adaptation resilience of coastal communities.

Through its four components, the project will strengthen regulatory frameworks, enhance data management and monitoring systems, and implement priority interventions to bolster coastal climate adaptation efforts. By fostering collaboration among government agencies, stakeholders, and communities, the CARI-SKN project strives to build a resilient coastal zone that safeguards both natural ecosystems and human livelihoods against the impacts of climate change.

6. Project Components and Financing

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
1. Strengthening the regulatory and political framework for integrated coastal zone management.	1.1: Relevant policies are revised and updated to integrate a coastal adaptation and needed strategies and plans specific to coastal zone management are developed, ready for implementation 1.2: A dedicated Coastal Zone Management Committee is established and operational 1.3: Capacities of and coordination among government agencies and coastal communities are enhanced	Government bodies strengthened their capacities regarding climate adaptation approaches and intergovernmental coordination and stakeholder dialogue are enhanced to mainstream climate adaptation into legislation related to integrated zone management and ensure effective enforcement of policies and regulations.	$975,000.00
2. Strengthening data management and monitoring systems	2.1: Coastal zones, marine-habitats, and adaptation needs are mapped. 2.2: Continuous data collection, processing, and management is established and strengthened. 2.3: Monitoring systems for beaches and coastal ecosystems are implemented and strengthened and existing Early Warnings Systems are enhanced.	Comprehensive mapping and monitoring of coastal vulnerabilities, including socio-economic vulnerabilities as well as the analysis of coastal adaptation and climate resilience needs is strengthened to enable identification and planning of project interventions.	$ 1,000,000.00
3. Strengthening of coastal resilient infrastructure and coastal ecosystem protection measures.	3.1: A coastal project implementation toolbox is developed to support structured, effective project implementation with sustainable impacts and meaningful up-scaling potential. 33.2: Priority actions for bolstering coastal resilience are	Priority coastal adaptation measures to enhance the protection and rehabilitation of coastal ecosystems as well as the resilience of coastal infrastructure are implemented, while the institutional mechanism is	$6,000,000.00

	undertaken 3.3: Lessons learned from project interventions collected and provided on dissemination platform.	operationalized to ensure the scale-up potential.	
4. Financing mechanism for the maintenance (and potential financing) of coastal resilience measures is established	4.1: Develop a national 'payment for coastal resilience' (PCR) strategy and act, including a prioritization system for allocation of resources and monitoring framework. 4.2: Set-up of a socially inclusive'Coastal Resilience Fund' under the Ministry of Finance (GovSKN), which manages and allocates revenues from taxes under the PCR act. 4.3: Develop a PCR communication strategy, including regional and local communication, and tourism-tailored communication.	The establishment of a sustainable financing mechanism, namely the Coastal Resilience Fund, to support the maintenance and potential financing of coastal resilience measures.#	$400,000.00
6. Project Execution cost			$825,000.00
7. Total Project Cost			$9,200,000.00
8. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			$775,000.00
Amount of Financing Requested			$10,00,000.00

Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	March 2025
Mid-term Review (if planned)	August 2027
Project Closing	January 2030
Terminal Evaluation	December 2030

PART II: PROJECT/PROGRAMME JUSTIFICATION

A. Describe the project components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience.

Component 1: Strengthening the regulatory, legislative, and political framework for integrated coastal zone management.

This component represents the core of the Technical Assistance (TA) provided by the CARI-SKN project, with the primary objective of building adaptive capacity through the enhancement of the current political and regulatory framework for integrated coastal zone management. The necessity for this enhancement has grown due to the current regulatory and political framework in St. Kitts and Nevis failing to adequately account for present and future climate risks. Consequently, this oversight has left the country vulnerable and unprepared for the impacts of climate change on its coastal and marine environments. Recent years have highlighted instances of coral bleaching from rising sea temperatures, a significant rise in invasive species, and a lack of coordinated efforts to manage coastal activities aimed at bolstering adaptive capacity. To address these gaps, this component aims to revise and update existing policies, strategies, and plans to promote sustainable practices and enhance resilience against climate impacts. This involves ensuring that the legislative and regulatory framework is robust enough to anticipate and respond effectively to ongoing and future climate challenges. Additionally, the initiative seeks to establish mechanisms such as workshops, dialogues, and a dedicated coastal zone management committee to foster coordinated and proactive management of coastal environments. Due to the nature of coastal zone initiatives, the current approach to climate adaptation initiatives is fragmented because there is no clear authority or strategy. Therefore the establishment of this committee will address the immediate issue of uncoordinated coastal activities, ensuring a unified approach to managing and protecting coastal and marine environments against the impacts of climate change. By enhancing awareness, knowledge, and engagement among stakeholders, the project aims to empower local communities and stakeholders with the necessary tools and information to support and implement adaptive measures effectively. Ultimately, these efforts aim to significantly strengthen St. Kitts and Nevis's resilience to climate change impacts on its coastal and marine environments. Through these initiatives, *Component 1* leads to the following Outcome:

Outcome 1: Government bodies strengthened their capacities regarding coastal zone management and inter-ministerial coordination and stakeholder dialogues are enhanced to mainstream climate adaptation considerations into legislation and ensure effective enforcement of policies and regulations.

Outcome 1 will be achieved through the following Outputs and Activities:

Output 1.1: Relevant policies and the requisite strategies and action plans are formulated and/or revised/updated to integrate a coastal zone management approach.

- Activity 1.1.1: Mainstream climate change adaptation considerations into the following plans and strategies to strengthen coastal protection: (i) a management plan for coral reefs; (ii) a management plan for invasive species including an invasive species pathway assessment;[22] (iii) a marine pollution strategy and action plan, including solid waste, industry point sources, pollution from ports, sewage effluent, non-point source pollutants; (iv) a Blue Economy Strategy and Action Plan; (v) a Strategy on Coastal Erosion and Siltation, including a shoreline management plan; (vi) an Integrated Coastal Zone Management Policy, that includes a coordinating mechanism for linkages between land and marine planning, (vii) a phase out strategy for beach and sand mining.
- Activity 1.1.2: Revise and update the following policies through a marine zoning and coastal adaptation lens: (i) the National Conservation and Environmental Protection Act[23]; (ii) the

[22] Aligned with the ongoing Invasive Species Pathway project (through the Department of Environment).

[23] The Act includes the preparation of a coastal zone management plan.

Aquaculture and Marine Resources Act; (iii) the Fisheries & Aquaculture Policy & Action Plan; (iv) the Draft National Fisheries Management Plan; the (v) Protected Areas System Plan (in line with the Coastal Master & Marine Spatial Plan 2020-2035); the (vi) Coastal Access and Beach Management Strategy; and (vii) the Nevis Zoning Plan Map.

Output 1.2: A dedicated Coastal Zone Management Committee is established and operational.

- Activity 1.2.1: Conduct a capacity needs assessment for the envisaged Coastal Zone Management Committee.
- Activity 1.2.2: Based on the Integrated Coastal Zone Management Policy, develop an Integrated Coastal Zone Management Strategy and Action Plan that establishes the implementation plan for a dedicated Coastal Zone Management Committee.[24]

- Activity 1.2.3: Establish a technical Coastal Zone Management Committee and equip the Committee with a mandate, and Terms of ReferenceThe Committee will bring together key line ministries, civil society, further relevant Blue and Green Economy-based entities,[25] amongst others. During the AF project lifetime, the activities of the Committee will be borne by the Project Steering Committee (PSC).
- Activity 1.2.4: Build the technical and organisational capacity of the Coastal Zone Management Committee based on the needs assessment.

Output 1.3: Capacities of and coordination among government agencies and coastal communities are enhanced.

- Activity 1.3.1: Conduct an Integrated Coastal Zone Management awareness and capacity development programme with government departments, civil society and NGOs, Fisher Organisations, Coastal Communities, the private sector, and research facilities.
- Activity 1.3.2: Enhance the capacities of the Department of Environment and the Department of Physical Planning in St. Kitts and the Department of Physical Planning and Environment in Nevis to track the results of adaptation measures that have been implemented.

Component 2: Strengthening data management and monitoring systems.

This component significantly enhances St. Kitts and Nevis's capacity for climate change adaptation planning and responding effectively to extreme climate events that threaten livelihoods and the country's natural environment. Comprehensive data, information, and robust monitoring of coastal and marine habitats are vital for strengthening effective decision-making and adaptation planning. Currently, the country faces specific data challenges, including fragmented data collection/management systems, insufficient monitoring capabilities and limited mapping of coastal vulnerabilities. These challenges have resulted in an inadequate understanding of vulnerable areas and therefore populations, hindering decision-making processes and delaying responses to climate impacts. Consequently, this has led to significant social, environmental, and economic losses in recent years (Figure 12) that could have been mitigated with better access to data and a deeper understanding of community-level vulnerabilities. To address these critical issues, this component will focus on several key actions: (i) enhancing data processing capabilities, (ii) establishing monitoring systems for beaches and coastal ecosystems and (iii) conducting comprehensive vulnerability mapping on both islands. Specifically, the types of data needed include high-resolution satellite imagery for detailed coastal mapping (eg. bathymetry, coastal land cover classification, coastal erosion and accretion data), real-time meteorological and oceanographic data for monitoring climate impacts (eg. sea surface temperature, sea level, wave and tidal data), and ecological data to assess the health of coastal and marine habitats (water quality, coral reef and seagrass data, and fish population data). By addressing the technological barriers of limited mapping and data management systems, the component aims to lay a foundation for improved data availability and mapping accuracy. Moreover, it will establish monitoring and vulnerability analysis tools essential for long-term data management and informed decision-making. Importantly, these enhanced

[24] In alignment with the scope of activities of the National Conservation Trust Fund.
[25] Discussions are ongoing in the country, weather to establish a dedicated unit to the field of coastal zone management. The Coastal Zone Management Committee established through the CARI-SKN project will take over all required responsibilities as of this project and might serve as a basis for the establishment of a Coastal Zone Management Unit in the medium term, as needed.

data management and monitoring capacities will feed into Output 3.1 and support the work of the established Coastal Zone Management Committee. This integration ensures that the data collected and analysed will directly inform policy formulation, adaptive management strategies, and resilience-building efforts. Furthermore, the component addresses the need for public communication by improving information availability and establishing a robust notification system for climate disasters, thereby enhancing community awareness and preparedness. This integrated approach aims to strengthen coastal management practices, bolster resilience to climate impacts, and contribute to sustainable development in St. Kitts and Nevis. . Through the described interventions, *Component 2* will lead to the following Outcome:

Outcome 2*:* Comprehensive mapping and monitoring of coastal vulnerabilities as well as the analysis of coastal adaptation and climate resilience needs is strengthened to enable identification and planning of project interventions.

Outcome 2 will be achieved through the following Outputs and Activities:

Output 2.1: Climate and Ocean Risk Vulnerability Index (CORVI) updated.

- Activity 2.1.1: Update existing maps and model coastal assets to support adaptation planning.
- Activity 2.1.2: Update coastal vulnerability assessment of coastal management zones and populations, based on activity 2.1.1 and aligned with existing/planned climate vulnerability assessment.
- Activity 2.1.3: Utilize deliverables from activities 2.1.1 and 2.1.2 to further develop the Climate and Ocean Risk Vulnerability Index (CORVI) for St. Kitts and Nevis.

Output 2.2: Improved coastal monitoring and data management systems to support Integrated Coastal Zone Management.

- Activity 2.2.1: Standardize methods of data collection, introduce a continuous data collection approach, and enhance database management, including an online database and dissemination plan to stakeholders.
- Activity 2.2.2: Implement the following coastal zone monitoring programmes with required equipment:[26] (i) Beach monitoring system,[27] including water quality, seasonal and post-storm erosion; (ii) Coastal ecosystems monitoring system, including reefs, silt, sand and sargassum weed, mangroves, and sea surface temperatures.
- Activity 2.2.3: Strengthen the coastal hazard (flood, tsunami, etc.) early warning system by establishing an effective disaster risk mass notification system that accounts for socially excluded populations.

Component 3: Strengthening coastal resilience and enhancing the protection and rehabilitation of coastal ecosystems.

Recent years have starkly illustrated the costly toll of extreme climate events on infrastructure and ecosystems in St. Kitts and Nevis (Table xx). Severe storms, rising sea levels, and intense rainfall have caused significant damage to coastal roads, houses, and other critical infrastructure, disrupting livelihoods and threatening community safety. The economic impact extends beyond immediate repair costs, encompassing long-term losses in productivity and development setbacks. Equally concerning is the degradation of coastal ecosystems (essential buffers against storm surges and erosion) which sustain biodiversity and provide crucial services to coastal communities. Addressing these challenges is urgent. Therefore, this component is crucial for advancing climate adaptation by implementing priority measures that enhance the resilience and protection of the most vulnerable coastal communities and ecosystems in St. Kitts and Nevis. Central to this effort is the development of a coastal project implementation toolbox, which will provide structured and effective guidance for executing future coastal adaptation projects. This toolbox will integrate modules on project steering, financing, stakeholder

[26] One prevailing constraint to monitoring programmes in the country is the lack of adequate monitoring equipment
[27] Examples of technical solutions could be the Aquatic Barrier Prioritization app (online: https://coastalres.wpengine.com/project/aquatic-barrier-prioritization/), or the Marsh Explorer app (online: https://coastalres.wpengine.com/project/marsh-explorer/).

engagement, and monitoring and evaluation, ensuring that interventions are sustainable and scalable. By leveraging the latest data analysis and vulnerability assessments provided by Outcome 2, the toolbox will support targeted actions in shoreline protection, ecosystem restoration, sustainable coastal management, and disaster risk reduction, which are all essential for climate adaptation. This component also emphasizes the implementation of engineering solutions for shoreline stabilization, coral reef restoration, and erosion mitigation, prioritizing ecosystem-based approaches (where applicable) that are integral to climate adaptation. These interventions aim to reduce vulnerability and build adaptive capacity in communities that have been identified through recent studies as facing the highest climate risks. Additionally, it focuses on collecting and disseminating lessons learned from project interventions, thereby informing future national and regional adaptation initiatives. By fostering stakeholder engagement and community participation, this component ensures that adaptation measures are responsive to the most current and specific climate-related needs and conditions, thereby enhancing the long-term sustainability and adaptive capacity of coastal communities in the face of increasing climate impacts.Successful implementation of Component 3 leads to the following Outcome:

Outcome 3: Priority coastal adaptation measures to enhance the protection and rehabilitation of coastal ecosystems as well as the resilience of coastal infrastructure are implemented.

Outcome 3 will be achieved through the following Outputs and Activities*:*

Output 3.1: A coastal project implementation toolbox is developed to support structured, effective project implementation with sustainable impacts and meaningful up-scaling potential.

- Activity 3.1.1: Develop a coastal project implementation toolbox, that involves modules such as project steering structures, financing models, stakeholder engagement approaches, social inclusion and gender equity approaches, project identification and preparation tools, as well as provisions for elaborating feasibility studies, planning, and a monitoring and evaluation (M&E) framework for coastal management measures (incl. impact and performance indicators). This toolbox will support the implementation of a variety of coastal management measures, such as shoreline protection (e.g., seawalls, groynes, and breakwaters), ecosystem restoration and enhancement (e.g., mangroves and coral reefs), sustainable coastal management practices (beach nourishment and restoration) and disaster risk reduction (e.g., early warning systems and emergency preparedness plans). It is worth noting that the improved data analysis and vulnerability assessments conducted under Outcome 2 will inform these future interventions. This will ensure that all future interventions are designed and implemented to address the most current and specific needs and conditions.
- Activity 3.1.2: Develop a systematic framework or criteria for prioritizing coastal projects based on factors such as vulnerability assessments, potential impact on communities and ecosystems, cost-effectiveness, alignment with national or regional priorities, and feasibility of implementation.
- Activity 3.1.3: Develop training programs and capacity-building workshops to familiarize relevant stakeholders with the coastal project implementation toolbox, ensuring its proper utilization and maximizing its impact.
- Activity 3.1.4: Establish mechanisms for continuous updating and improvement of the coastal project implementation toolbox to adapt to evolving project needs, emerging challenges, and advancements in best practices and technologies. This activity will be closely linked to Output 3.3, which focuses on collecting and disseminating lessons learned from project interventions through a dissemination platform. Therefore, the insights gained and lessons learned will extend beyond the lifetime of the project. They will inform future initiatives and contribute to ongoing improvements in coastal resilience and management practices.

Output 3.2: Priority actions for bolstering coastal resilience are undertaken.

- Activity 3.2.1: Develop engineering designs for comprehensive coastal management solutions encompassing shoreline stabilization techniques, coral reef restoration initiatives, and erosion mitigation strategies, prioritizing ecosystem-based approaches where feasible.

- Activity 3.2.2: Deploy comprehensive measures for the prevention of beach erosion, encompassing shoreline stabilization techniques, vegetative buffers, and engineering solutions tailored to local conditions.

This activity focuses on implementing measures to protect vulnerable communities, of which a significant portion are located along the coast or in low-lying areas which makes them vulnerable to the effects of climate change, as well as natural hazards. An assessment carried out by CEAC Ltd. in 2019-2020 suggested measures to strengthen the resilience of coastal infrastructure in high priority areas. From their analysis one of the most vulnerable areas was the Bay Road in Basseterre St. Kitts which will be the focal area for this intervention. Additionally, a study conducted by CBCL in 2019 also highlighted the need for physical interventions along the North Frigate Bay coastline. From both studies, the proposed measures comprised a combination of a steel reinforced cantilever retaining seawall in combination with an armoured stone revetment for mitigating against scouring of the wall foundation. Mainly available materials on the island are considered, in order to increase the sustainability of the seawall construction. This is proposed in combination with using ecosystem services through ecosystem rehabilitation measures (in line with activity 3.2.3).

Table 3: Typical coastal protection strategies and associated characteristics (Source: CEAC (2019), Feasibility Report, pp. 17)

Vulnerability Mitigation Measure				
Soft Solutions		**Hard Solutions**		
Hazard Preparedness	**Strategic Relocation**	**Shoreline Rehabilitation**	**Construct Seaward**	**Ecosystem Rehabilitation**
Essential Components				
• Map areas at risk • Ensure public education and awareness • Improved warning and forecast systems • Communication systems, including redundancy • Evacuation plans shelter facilities • Post-disaster response and recovery	• Purchase or acquire land • Relocate roads, utilities, and facilities • Relocate residents • Compensate land and business owners	• vertical walls • revetments (buried or exposed) • boardwalks • short groynes	• armoured land fill • beach nourishment	• Integrated coastal zone management • mangrove planting • coral reef habitat creation
Advantages				
• Focusses resources on saving lives • Generally not capital intensive	• Creates a natural hazard buffer area • Often used in combination with ecosystem enhancement	• Well-established design methods • Stakeholders recognise as an accepted method • Local job-creation during construction • Immediate protection	• Provides buffer area from hazards • Provides additional space for recreation • Buffer guards against future erosion and climate change • Local job-creation during construction	• Works with "nature" • Can be done using low-skilled labour and equipment • May improve marine conditions; fishing and recreation Local job-creation during construction
Disadvantages				
• Infrastructure and property remains "at risk" • Evacuations are disruptive to stakeholders	• Local topography may preclude it • Valuable land is "sacrificed" • Stakeholder's reluctance (political, soci-	• Short project lifespan if climate change projections are underestimated • Fewer tangential benefits • Capitally intensive	• Potential impact to alongshore sediment balance • Capitally intensive • Potential impact on nearshore	• Only partial protection from coastal hazards • Requires on-going maintenance

• Repair and replacement costs may be significant	economic, heritage, etc.)	• May occupy coastal space	benthic community	• Requires existing functioning ecosystems • Potential long time to see benefits
Risks Involved				
• Not all stakeholders comply • Relies on effective emergency management system	• Land acquisition challenges • Full retreat not achieved	• Design conditions may be exceeded and systems fail	• Downdrift erosion	• Ecosystem may degrade in the future

Table 4: Summary of Multi-Criteria Analysis (Source: CEAC (2019), Feasibility Report, pp. 18)

Parameter	Vulnerability Mitigation Measure				
	Hazard Preparedness	Strategic Relocation	Shoreline Rehabilitation	Construct Seaward	Ecosystem Rehabilitation
Effectiveness					
Protection against coastal erosion	1	1	5	3	2
Stability to storm impacts	1	1	4	2	2
Predictability of coastal response to protection	4	4	4	3	3
Level of protection to property and infrastructure	1	1	5	4	3
Technical Viability					
Ease of construction	--	--	1	3	4
Maintenance requirements	--	--	1	1	3
Flexibility for implementation changes	--	--	4	4	4
Availability of construction material	--	--	3	3	2
Economic Viability					
Cost-Benefit score including maintenance cost	--	--	3	3	3
Opportunities for local employment	5	5	5	5	5
Opportunities for future spatial development	--	--	3	5	2
Avoided costs for damage to property and infrastructure	--	--	5	3	2
Social Influence					
Recreational value	1	1	2	4	2
Commercial value	1	1	2	3	2
Stakeholder acceptance	5	1	5	5	5
Ecosystem Resilience					
Protection of existing coastal ecosystem	--	--	2	2	3
Improvement to functionality of coastal ecosystem	--	--	5	5	5
Environmental Impact					
Impact to local ecosystem	--	--	5	5	5
Use of naturally present local resources	--	--	3	1	2
Aesthetics and fit to landscape	--	--	4	5	4
Climate Change Adaptation					
Stability under current predictions	--	--	5	5	5
Future adaptability to accommodate climate change impacts	--	--	5	2	1
Score	**19**	**15**	**81**	**76**	**69**

- Activity 3.2.3: Execute targeted initiatives for the restoration of coral reefs, employing coral transplantation, artificial reef structures, and habitat enhancement to enhance ecosystem health and biodiversity.

Measures under this activity include several reef restoration initiatives at key sites: Calypso Bay, Green Point, Church Reef (Artificial reefs), and Tamarind Cove (nursery site). Critical preparatory work has been carried out by the recently completed IWEco Project, with detailed assessments for St. Kitts and Nevis offering valuable insights into these planned measures. The IWEco project successfully piloted the installation of 12 MoREEF artificial reef modules at Tamarind Cove, Nevis, in 2022. Building on this success, the CARI-SKN project is well-positioned to apply and scale up these reef modules at other selected coral reef nursery sites. The innovative stackable MoREEF design modules create hurricane-resistant reef-like structures tailored to support various habitats and species. Initial surveys of the IWEco interventions have shown a positive impact, with marine biodiversity increasing in and around the MoREEFs. These restored reefs play a crucial role in acting as natural buffers, protecting the shoreline from erosion and mitigating the impacts of storm surges and rising sea levels. Additionally, by enhancing the resilience and biodiversity of coral reefs, the CARI-SKN project's efforts will provide critical habitats for marine life and support the overall health and sustainability of coastal ecosystems. These measures are essential for safeguarding the marine environment of St. Kitts and Nevis against the impacts of climate change by ensuring the long-term protection of the shoreline and the livelihoods that depend on it.

- Activity 3.2.4: Conduct shoreline management and restoration activities to mitigate erosion and preserve coastal habitats.

This activity seeks to prevent erosion along the coast east of Charlestown as well as New Castle (focus areas are Indian Castle, Potworks and New River). As further detailed by the assessments undertaken in the course of the Coconut Walk Revetment Project (GEF Small Grants / IWEco and NHCS), major activities will comprise the installation of gabion baskets, planting of vetiver grass, as well as drainage redirection (divert to holding area to supply farmers with water supply as this is a drought prone area). Also, reforestation of local trees and mangroves, as well as seagrass planting will be used as an ecosystem-based approach to counteract erosion. A feasibility study on erosion prevention measures must be conducted in the further project development. Measures will lead to enhanced sediment control to prevent quarry silt from entering coastal waters and negatively impacting offshore coral reefs. Hereby, measures aim at upscaling pilot actions conducted under the GEF supported “Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States” project (IWEco project). IWEco project interventions in St. Kitts & Nevis involved the installation of gabion baskets and deep-rooted vetiver grass, which have been applied at the College Street Ghaut watershed (St. Kitts) and an abandoned quarry at Potworks Estate and a coastal wetland at Nelson’s Spring (Nevis). Hence, knowledge from the IWEco project can be leveraged (and complementarities between GCF and GEF investments could be further enhanced).

For the respective sites, the combination of gabion baskets and deep-rooted vetiver grass has been chosen for several reasons. A gabion basket, a galvanized wire cage filled with materials like concrete, stones, sand, or soil act effectively as building blocks and become a powerful and cost-effective defence against erosion. Deep-rooted vetiver grass will then be planted along the gabion baskets and banks to prevents surface erosion and shallow slides by slowing the speed of rainfall runoff and holding soil particles in place. Deeply rooted vegetation prevents slumps and slides through stabilization from the root systems. In addition, this grass (known locally as couscous or bedgrass) is used for weaving and handicrafts, thus providing a livelihood for many persons. The use of gabion baskets has been categorised as nature-based solution (NbS), based on the recently developed IUCN Global Standard for verification, design, and scaling up of nature-based solutions. The standard comprises 8 criteria and 28 associated indicators. The IWEco project gabion baskets in combination with deeply rooted vegetation achieved a good score to be classified as an NbS solution. Positive benefits to human well-being include mitigation of flooding risk and improved water quality in receiving waters. Also, biodiversity benefits include the propagation of vetiver grass and other native species which prevent soil erosion but can be used for livelihood generation.

Output 3.3: Lessons learned from project interventions collected and provided on dissemination platform.

- Activity 3.3.1: Compile and disseminate project documentation through the CCCCC data clearinghouse. This documentation will include detailed accounts of best practices, challenges encountered, and effective strategies employed. Specific lessons expected to be learned include: (i) effective coastal resilience building techniques for SIDS, (ii) ecosystem restoration

methods, (iii) stakeholder engagement strategies, (iv) implementation challenges, (v) local knowledge integration and (vi) data management and monitoring protocols. With these lessons the aim is to develop a practical guide or toolkit for stakeholders involved in implementing similar coastal resilience projects to facilitate knowledge transfer, and support the successful replication of similar initiatives. This activity will also include determining what constitutes 'best practice' through continuous evaluation and stakeholder feedback.

- Activity 3.3.2: Facilitate interactive workshops with stakeholders, including coastal communities, to promote awareness of project impacts and foster active participation in coastal zone management initiatives. These workshops will focus on discussing specific lessons learned and collaboratively determining best practices.
-

Component 4: Financing mechanism for the maintenance of coastal resilience measures is established.

This component aims to establish a robust financial framework to enhance coastal resilience initiatives in Saint Kitts and Nevis. Through extensive stakeholder engagement and the development of legislative frameworks, a comprehensive 'payment for coastal resilience' (PCR) strategy and act will be formulated. This strategy will ensure efficient resource allocation and rigorous progress monitoring. Additionally, a 'Coastal Resilience Fund,' managed by the Ministry of Finance, will be implemented to introduce transparent fund management practices and foster collaboration with financial institutions, in line with regulatory standards. The coastal resilience financing mechanisms will be anchored in the concept of "payment for ecosystem services," specifically targeting actions that bolster coastal resilience.. The core objective of the PCR strategy is to compensate for the exploitation of natural resources in marine areas, mitigate disturbances and damages to coastal ecosystems, and regulate the use of marine areas. This approach guarantees that the maintenance costs of interventions under Output 3.2 are funded beyond the lifespan of the CARI-SKN project, thereby ensuring sustainable long-term protection for St. Kitts & Nevis' coastlines. Initial financing for setting up the mechanism is envisioned to come from the AF. For long-term funding sustainability, several tax options are being considered, including leveraging the tourism sector as a revenue source due to its dependence on thriving biodiversity, ecosystems, and coastal protection. Potential tax approaches include a tourism levy, an arrival tax for cruise ships, a tourism accommodation fee, a local usage fee for protected areas, or a corporate pollution tax. Detailed mechanisms and further political considerations involving the Ministry of Finance will be outlined in the full funding proposal.Complementing these endeavours, a targeted communication strategy will be deployed to amplify awareness of the PCR strategy, facilitate knowledge exchange, and catalyse the replication of successful models throughout the region.

Outcome 4: A sustainable financing mechanism is established, namely the Coastal Resilience Fund, to support the maintenance and potential financing of coastal resilience measures, thereby enhancing the long-term resilience of coastal communities.

Outcome 4 will be achieved through the following Outputs and Activities:

Output 4.1: Develop a national 'payment for coastal resilience' (PCR) strategy, including a prioritization system for allocation of resources and monitoring framework.

- Activity 4.1.1: Engage key stakeholders, including government agencies, coastal communities, representative groups of vulnerable populations (including women and youth), civil society organisations, and relevant experts, in workshops and consultations to gather input for the PCR strategy and act.
- Activity 4.1.2: Draft the PCR strategy and act, incorporating input from stakeholders and aligning with national development goals and climate resilience priorities.
- Activity 4.1.3: Establish a monitoring framework to track the implementation and effectiveness of the PCR strategy, indicators (where possible disaggregated by age and sex) to measure progress towards resilience objectives and adaptation outcomes.

Output 4.2: Set-up of 'Coastal Resilience Fund' under the Ministry of Finance (GovSKN), which manages and allocates revenues from taxes under the PCR act.

- Activity 4.2.1: Develop operational guidelines for the fund, outlining eligibility criteria, application processes, transparent fund allocation mechanisms, socially inclusive and equitable mechanisms. and operationalization procedures.
- Activity 4.2.2: Draft legislation or regulatory frameworks to formalize the establishment and governance structure of the Coastal Resilience Fund.
- Activity 4.2.3: Collaborate with financial institutions to establish secure and accountable mechanisms for managing and allocating revenues into the fund, ensuring compliance with regulatory standards.

Output 4.3: Develop a PCR communication strategy, including regional and local communication, and tourism-tailored communication.

- Activity 4.3.1: Create tailored communication materials, such as informational brochures and multimedia content, to raise awareness and understanding of the PCR strategy among stakeholders.
- Activity 4.3.2: Facilitate knowledge-sharing platforms and regional workshops to disseminate best practices and lessons learned from the establishment of the Coastal Resilience Fund, with a focus on promoting replication and adaptation of the model in other countries within the region.

B. 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.

Environmental Benefits

The CARI-SKN project will have direct positive environmental outcomes, as achieved by the envisioned project interventions. Environmental benefits include enhancing climate resilience against coastal erosion and the protection, conservation, and rehabilitation of coastline ecosystems and biodiversity, including marine ecosystems. This includes but is not limited to: (i) the reduction/elimination of beach sand mining, (ii) the rehabilitation of coral reefs, and (iii) theenhcnacement of ecosystem services. Additionally, flood prevention measures will also protect against the destruction of coastal communities and natural habitats. The project's interventions will have several environmental co-benefits that result from direct project outcomes. For instance, in healthy coastal ecosystems, including mangroves and seagrass, the force of currents and overall coastal erosion is decreased and water movements, sediments, and nutrients in coastal watersheds are naturally regulated. Coastal ecosystems moreover can help decrease flooding which would have serious impacts on the habitats of marine and terrestrial fauna and flora. Rehabilitation of ecosystems has various positive effects on biodiversity and the balanced co-existence of marine species, including limiting the spreading of invasive species.

The planting of trees, mangroves, seagrass, and vetiver grass will largely benefit biodiversity and create and rehabilitate habitats for native species. The propagation of vetiver grass, for instance, already showed respective positive benefits under the IWEco project activities. Furthermore, enhanced regulations for ecosystem management as well as increased awareness of stakeholder groups will decrease waste pollution in coastal areas, particularly from the tourism sector. In addition, healthy coastal wetlands (including seagrasses) have the capacity to enable blue carbon sequestration, while unhealthy coastal wetlands are potentially great carbon emitters. The project's emission reduction potential is estimated to be a significant co-benefit due to planting of trees, mangroves, seagrass, and vetiver grass. Additionally, sustainable coastal zone management will contribute to future avoided

emissions through the destruction of ecosystems. The concrete carbon emission reduction potential will be modelled for the full funding proposal.

The project will also focus on fostering community engagement and participation in environmental conservation efforts. By involving local communities in the implementation and maintenance of project activities, the project aims to build local capacity and promote a sense of ownership over natural resources. Educational programs and workshops will be conducted to raise awareness about the importance of coastal ecosystems and the benefits of sustainable management practices. These initiatives will empower communities to take an active role in protecting their environment and ensure the long-term sustainability of the project's outcomes.

Social Benefits

The CARI-SKN project is poised to deliver significant social benefits by addressing the impacts of flooding, storms, and other extreme weather events that often result in displacement, migration, and loss of livelihoods for coastal communities in St. Kitts and Nevis. By implementing targeted measures to mitigate these effects, the project will not only reduce economic losses but also safeguard cultural heritage and social cohesion. Additionally, the restoration of coastal ecosystems, such as coral reefs and vegetation, will provide tangible benefits to communities reliant on healthy terrestrial and marine environments for their sustenance. For instance, initiatives like coral reef restoration programs will foster a greater diversity of local marine species, ensuring sustainable fishing grounds for local fisheries and supporting the livelihoods of fishers who depend on biodiversity for their income.

Furthermore, the rehabilitation of coastal vegetation will not only enhance biodiversity but also contribute to improved air quality, health, and overall well-being of inhabitants. By promoting a more sustainable management of natural resources, the project will create lasting social impacts, including strengthened community resilience, enhanced livelihood opportunities, and a greater sense of pride and ownership among local residents. Through these efforts, the CARI-SKN project will not only mitigate the immediate risks posed by climate change but also lay the foundation for a more resilient and prosperous future for coastal communities in St. Kitts and Nevis.

Gender Benefits

The project will contribute to improved gender integration in coastal zone management planning and in development and implementation of EWS. Integrated planning ensures that the needs of different genders are considered when undertaking CZM initiatives. Successful implementation of shoreline stabilisation measures may also lessen the compounding vulnerabilities of women within McKnight cluster of Basseterre. The preliminary Gender Analysis (Annex 1) outlines potential gender solutions that will yield gender benefits if effectively implemented.

Economic Benefits

The protection of coastal ecosystems will yield substantial economic benefits across various sectors, notably in the food industry and tourism sector of St. Kitts and Nevis. The food industry relies heavily on healthy coastal ecosystems and their resources, with marine sources playing a crucial role in food availability. Strengthening marine ecosystems is expected to increase food availability from marine sources, which is particularly vital for fisheries facing economic challenges. Implementing sustainable fishery practices through coastal zone management will ensure the long-term viability of ecosystems and the livelihoods of fishers. Moreover, the tourism sector, contributing approximately 22% to the country's GDP, heavily relies on coastal environments and ecosystems. The sector thrives on the islands' pristine nature and vibrant beaches. Preventing beach erosion and enhancing nature conservation and biodiversity will further attract tourists, thereby boosting revenues for affiliated businesses. Given the tourism sector's potential impact on environmental pollution, effective coastal zone management, including sustainable tourism practices, is imperative.

Furthermore, the project will create gender-inclusive employment opportunities through new roles in coastal zone management and resilient infrastructure construction. Considering the country's susceptibility to climate disasters like hurricanes, which inflict significant economic damage on livelihoods, the CARI-SKN project's resilience measures can mitigate these effects. By safeguarding critical infrastructure and enhancing coastal resilience, the project will help minimize economic losses

from extreme weather events, thereby fostering sustainable economic development and prosperity for communities in St. Kitts and Nevis.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme.

The proposed CARI-SKN project aims to bolster coastal resilience through a multifaceted approach encompassing robust coastal zone management, capacity building, policy enhancements, and the establishment of a Coastal Resilience Fund. Its cost-effectiveness is evaluated by weighing the upfront costs of these interventions against their long-term benefits, particularly in reducing risks associated with climate-related disasters and enhancing socio-economic stability.

The strategic focus on preventive measures, such as shoreline stabilization and coral reef restoration, underscores its cost-effectiveness. By proactively fortifying vulnerable coastal areas, the project mitigates potential economic losses that would arise from damages to critical infrastructure and key economic sectors like tourism and fisheries. This proactive approach can lead to substantial savings in repair and recovery costs associated with infrastructure, housing, and public facilities following extreme weather events. Furthermore, the project anticipates substantial savings by reducing reliance on emergency responses during disasters. Enhanced early warning systems and preparedness measures enable timely interventions, minimizing the need for costly relief efforts. This proactive approach not only saves financial resources but also enhances the resilience of communities and infrastructure against future climate challenges. By integrating sustainable practices and resilience strategies, the project aims to secure a prosperous and resilient future for St. Kitts and Nevis, aligning economic development with environmental stewardship.

Preserving economic activities in the tourism and fisheries sectors is paramount to the project's goals. Tourism in St. Kitts and Nevis relies heavily on pristine coastal environments, including beaches and coral reefs, which attract visitors and support local businesses. By safeguarding these assets from climate impacts such as erosion and habitat degradation, the project ensures the continuity of tourism revenues and sustains livelihoods dependent on the sector. Similarly, the project's focus on ecosystem-based adaptation measures in fisheries supports sustainable fish stocks and resilient fishing communities. This approach not only protects income streams from fishing but also maintains food security and cultural practices tied to marine resources. Maintaining these sectors' stability contributes to sustained economic growth and employment, thereby avoiding potential losses due to downturns in these industries.

The potential cost savings from implementing the proposed project will be further detailed in the Full Funding Proposal. This proposal will provide precise cost estimates by analyzing factors such as the extent of infrastructure protected, the frequency and severity of climate events, the effectiveness of resilience measures implemented, and the economic valuation of avoided damages. Detailed cost-effectiveness analysis will forecast potential savings over a specified period, considering both the upfront costs of implementing resilience measures and the expected reductions in damages and emergency response expenditures.

D. 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.

SKN's *Updated Nationally Determined Contributions* (NDC) express the country's commitment to improving resilience and capacities to adapt to the long-term impacts of climate change and ensure the well-being and prosperity of its population and the health of its natural resources. Furthermore, the NDC outlines the priority areas and actions for the country's sustainable development agenda. In this regard, coastal zone management is identified as a critical pillar of SKN's adaptation approach. The NDC (2021, p. 5) states: "Integrated coastal zone management will build the resilience of coastal and marine ecosystems and associated livelihoods to climate change disasters". The NDC implementation plan further emphasises concrete actions that are needed for addressing vulnerabilities of coastal and

marine ecosystems, however, the NDC also points to a lack of sustainable financing. This project directly aligns its interventions with the identified activities in the *NDC Implementation Plan*.

Moreover, interventions of the CARI-SKN project are closely related to three other important national policies. The *Climate Change Adaptation Strategy* provides guidance on priorities and appropriate measures for adaptation to reduce vulnerability to the impacts of climate change and build resilience over the long term in St. Kitts and Nevis. The policy document suggests seven programmes of action, among which Integrated Coastal Zone Management is one of them. According to SKN's updated NDC, more than 50% of outlined activities in the policy for this field could not be planned or implemented as of yet. The CARI-SKN project takes several of these activities into account. The *Management Plan for St. Kitts and Nevis Marine Management Area: 2021 – 2025*, provide a practical and strategic framework to allow for the effective and efficient management of the country's Marine Management Areas. The policy outlines several sectors that require integration in a sustainable marine management concept, such as conservation, fisheries, tourism and transportation. Project activities align and build on the Marine Management Areas addressed in the policy. The *2021 St. Kitts and Nevis Coastal Master and Marine Spatial Plan* was designed to prepare the Government of St. Kitts and Nevis (GovSKN) for the next generation of marine spatial planning and frame an anticipated fifteen-year transition towards the Blue Economy for St. Kitts and Nevis. While the Marine Spatial Plan lays out marine zoning frameworks, the Coastal Master plan provides Blue Economy investment opportunities and priority projects that have been considered under the CARI-SKN project design.

In addition, the CARI-SKN project is aligned with the following policies, among others: Coastal Protection Plan (2001), National Environmental Management Strategy (2005), National Conservation and Environment Protection Act (2009), National Energy Policy (2011), National Disaster Plan (2013), NCCAS and Plan for the Water Sector (2014), Fisheries, Aquaculture and Marine Resources Act (2016), Draft Fisheries Management Plan, National Multi-Hazard Health Disaster Management Plan (2019), Protected Area System Plan (2020), National Ocean Policy & Strategic Plan (2020), Urban Resilience Plan and Playbook for Greater Basseterre (2022), CARICOM Regional Framework for Achieving Development Resilient to Climate Change (2009)

The CARI-SKN project is also aligned with the recently developed *GCF Country Programme 2022*, which identifies coastal and marine ecosystems as a priority sector. The Country Programme also emphasizes the importance of actions to mainstream integrated coastal zone management and Blue Economy approaches into legislation as well as to strengthen data availability and management, as addressed by the CARI-SKN project.

Also, the CARI-SKN project aims at leveraging insights and achievements of other conducted projects in the field of coastal zone management in SKN. Examples are the *iLand Resilience Programme*,[28] a project that is funded by the EU and implemented by the Caribbean Natural Resources Institute (CANARI) to provide technical assistance for the development of institutional frameworks towards improved environmental management. Furthermore, the project will seek guidance from regional insights of the *Eastern Caribbean Marine Managed Areas Network (ECMMAN) Project*,[29] which, on a regional level, strengthened and established new Marine Managed Areas, enhanced the capacities of fishers/coastal communities on marine conservation, and strengthened networking and decision-making tools. Additionally, project activities will be complementary to the *Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (GEF-IWEco) Project*,[30] which is a regional project that addresses water, land and biodiversity resource management as well as climate change. The IWEco project is funded by the Global Environment Facility (GEF) and includes a national sub-project in St. Kitts and Nevis that addresses the impacts of acute land degradation in the College Street Ghaut in St Kitts as well as quarries and sand mining hotspots on Nevis. The CARI-SKN project will also align with the *Climate and Ocean Risk Vulnerability Index (CORVI) Project*,[31] which recently expanded to Basseterre, addressing the lack of data and information on climate-related risks. Additionally, results from the *Climate Change Adaptation in the Eastern Caribbean Fisheries Sector*

[28] See online: https://canari.org/wp-content/uploads/2017/08/OECS-GCCA-project-brief_final.pdf
[29] See online: https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/Caribbean/science/management/Documents/ECMMAN%20Project%20Fact%20Sheet%20-%20May%202014.pdf
[30] See online: https://www.iweco.org/
[31] See online: https://reliefweb.int/report/saint-kitts-and-nevis/corvi-project-expands-basseterre-st-kitts-and-nevis

Project (CC4FISH) will be taken into account. CC4FISH aimed at increasing resilience and reduce vulnerability to climate change impacts in the eastern Caribbean fisheries sector, through the introduction of adaptation measures in fisheries management and capacity building of fisherfolk and aquaculturists.[32] Despite several other regional projects in the field of Blue Economy and coastal adaptation, other national projects that are taken into account are:

- Rehabilitation of Old Road Bay Road
- Coastal Erosion Mitigation Project South Frigate and Friars Bay
- Rehabilitation of Old Road Fisheries Complex

E. Describe how the project/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

The project will adhere rigorously to Saint Kitts and Nevis's national technical standards to ensure the robust implementation of its activities across various sectors. Where necessary, the project will conduct comprehensive Environmental Impact Assessments (EIAs) in accordance with the National Conservation and Environment Protection Act and associated regulations. These assessments will evaluate potential environmental risks and propose mitigation measures to safeguard ecosystems and biodiversity, aligning with international best practices. Furthermore, the project will comply with Development Control and Planning Act No. 14 to ensure infrastructure resilience against climate impacts, particularly relevant given the focus on coastal infrastructure and community resilience measures.

Water quality regulations will be rigorously followed during project implementation, guided by the Watercourses and Waterworks Ordinance (Chapter 185), which governs the protection and sustainable use of water resources. Agricultural and forest regulations, including those outlined in the Land Development Act, no. 1, will also be integrated into project activities to promote sustainable land use practices and preserve natural habitats. By adhering to these standards, the project not only ensures environmental sustainability but also fosters resilience to climate change impacts through responsible resource management and infrastructure development.

Specific documents and standards referenced will also include the Solid Waste Management Act, 2009 (No. 11 of 2009), Noise Abatement Act, 2008 (No. 2 of 2009), Fisheries Aquaculture and Marine Resources Act (No. 1 of 2016), Public Health Act, no. 22 of 1969 (Chapter 9.21), and The Bureau of Standards and Quality Act, no. 19 of 2021. These frameworks will guide the project's approach to environmental compliance and sustainable development, aligning closely with national policies and enhancing the project's effectiveness in achieving its objectives.

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

There is no duplication of efforts anticipated with other funding sources for the CARI-SKN project. However, it is expected to complement existing initiatives and projects that share similar objectives and focus areas. Through coordination and collaboration with relevant stakeholders, including government agencies, non-governmental organizations, and international development partners, the project aims to leverage existing resources and expertise to maximize its impact and effectiveness in addressing climate resilience challenges in Saint Kitts and Nevis.

[32] CC4FISH was implemented by the Food and Agriculture Organization of the United Nations (FAO) and the national fisheries authorities from the seven project countries: Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago, with funding from the Global Environment Facility (GEF).

The current initiatives in St. Kitts and Nevis are limited to the Rehabilitation of Old Road Bay Road, which is in its final stages, the Coastal Erosion Mitigation Project at South Frigate and Friars Bay, which focuses specifically on beach restoration on two beaches, and the CC4FISH project, which is yet to begin and focuses exclusively on the fisheries sector, not coastal zone management. These existing projects primarily concentrate on physical interventions. In contrast, the CARI-SKN project adopts a more holistic approach by incorporating softer elements such as policy enhancements, capacity building, and community engagement. These elements are expected to significantly contribute to the success of the other projects by ensuring sustainable practices, fostering local ownership, and enhancing the overall resilience of coastal zones.

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

Replicability is built into the design of the CARI-SKN project interventions. Component 1 is developed to establish a dedicated coastal zone management committee which will govern future coastal zone management projects. While being key to the implementation of CARI-SKN project intervention, the project is also designed to ensure effective replicability of coastal resilience and blue economy activities. Replicability is facilitated through several tasks of the committee, including the maintenance of a coastal protection and coral reef restoration measures pipeline to identify and prioritize new and planned future interventions, the development of a long-term climate finance strategy for coastal protection and blue economy measures, the establishing and managing a monitoring and evaluation framework for the performance of coastal protection measures and project interventions (which can be used for informing lessons learned), and the fostering regional exchange on coastal protection measures.

Moreover, component 3 comprises activities to evaluate the project interventions and develop a report on lessons learned and implications for future coastal protection measures in SKN. Additionally, Component 4 is designed to create a lasting financial framework that bolsters coastal resilience initiatives in Saint Kitts and Nevis. Hence, the design of projects beyond the CARI-SKN project can be well informed by knowledge products and lessons learned from CARI-SKN project interventions.

Strengthened coordination among government agencies and regional institutions in the field of coastal resilience will further increase the exchange of lessons learned and enhance the potential for replicability of project elements. Also, the creation of enhanced availability and access to data (Component 2), as well as hands-on information by projects will reduce perceived risks of investments in climate resilience technologies and strategies.

In the long-term, project planning and financing tools, as well as lessons learned from CARI-SKN investments will contribute to a long-term conducive environment for well-informed coastal adaptation investments. Both short-term and long-term effects of the project are displayed in the Theory of Change diagram (Annex 2).

H. 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.

The concept note development has placed country ownership at the centre of its processes. Under the 2019 approved GCF Readiness Proposal “Institutional Capacity and Coordination and Country Programming”, a country programme was developed that directly informed the initial project idea. The country programme development followed an iterative process which consulted a broad range of stakeholders, based on the established country coordination mechanism, steered by the UNFCCC Focal Point and advised by members of the National Sustainable Development Coordination Committee (NSDCC).

For the Concept Note development process itself, a Working Group (WG) was established which met regularly between August 2023 and March 2024 to give inputs, feedback and reflect on key aspects of

the project concept. Regular meetings have been scheduled for validating the achievement of key milestones, such as the validation of country vulnerabilities and needs, the identification of main barriers and root causes, the development of components and project activities, and the development of the project's indicative financing structure. The WG process has been facilitated and led by the UNFCCC Focal Point. The WG aimed at establishing equal representation from the island of St. Kitts and the island of Nevis and included the following member institutions:

- Department of Economic Affairs and Public Sector Investment Planning (NDA)
- Ministry of Environment and Climate Action
- Ministry of Public Infrastructure
- Department of Marine Resources
- Departments of Physical Planning in St. Kitts and in Nevis
- National Emergency Management Agency (NEMA)
- Nevis Disaster Management Department (NDMD)
- Environmental Health Department

Community feedback was captured in conducting the Road Sector Hazard Risk and Vulnerability Report which has informed this project's interventions. A Community Vulnerability Assessment (CVA) was undertaken in 2019 to collect data from the community on hazards, coping mechanisms, capacities and vulnerabilities and use this information to gain their perspective on how hazards can be mitigated. There were separate consultations with males and females within communities that supported identified gender differentiated needs and perceptions and solutions.

Additionally, to ensure inclusivity and gather diverse perspectives, various stakeholder groups will be engaged through interviews and consultations. These groups will encompass the private sector, civil society organizations, women's groups, regional entities, active NGOs, academia, youth organizations, and specific community groups such as those residing in coastal areas.

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

a. Justification of AF support

The Government of St. Kitts and Nevis is committed to improving coastal zone management, mainstreaming Blue Economy approaches into legislation, and establishing coastal resilience measures. The CARI-SKN project activities directly align with interventions identified in the country priorities of several key policy documents, including the Nationally Determined Contributions and the SKN Climate Change Adaptation Strategy. Both documents state that over 50% of interventions could not be implemented yet, despite their identification as important for the country's adaptive capacity. A major reason for the lacking enforcement of measures is the limitation of resources, such as human resources and public investment capital. As a small island developing state, St. Kitts and Nevis has a limited public budget that cannot fully cope with the urgent need for large-scale adaptation measures, particularly for the country's coastal areas. Moreover, St. Kitts and Nevis' debt position does not allow for a large deficit spending, if the country wants to achieve sustainable debt levels. The country is especially vulnerable given the COVID-19 pandemic which not only eroded surpluses and GDP but also presented socio-economic hardships that the government had to address in a tight fiscal space. The pandemic resulted in an estimated annual decline in GDP of 14 percent, and a government fiscal deficit of 4.7 percent of GDP (for 2021). The country is in a situation that any major climatic activity or event will present a strain on the finances of the country which can lead to an increase in the debt to GDP. At this stage the country is trying to increase GDP through capital investment, while at the same time providing the social safety nets to individuals who, after two years, are still seeking gainful employment.

b. Alternative funding options

Alternative funding options are very limited. Currently, private sector finance is absent due to lacking incentives, missing information, high perceived investment risks, and low/absent returns on investment. However, through the AF's financing of projects, lessons learned can contribute to crowding in new sources of finance, including the engagement of the private sector for adaptation financing under innovative financial models.

c. Justification of concessionality

The absence of alternative funding options and the limitation of public financial resources for climate adaptation measures stays in contrast to the increasing threats and risks that climate change imposes on the country's coastal areas. Immediate interventions and impact are needed. The AF's support bridges current financial shortcomings and can prevent St. Kitts and Nevis from losing time against urgent climate change risks. In addition, the CARI-SKN project is focussing solely on public goods and services. In this context, the government of St. Kitts and Nevis is requesting 100% concessionality (grant funding) from the AF. The project will not yield any direct profit to the Government or other private/public entities. This AF grant will play an important role in creating an immediate impact on the ecosystem and livelihoods as well as setting up enabling structures that help embark on a national comprehensive Blue Economy and coastal zone management approach for the benefit of the people in St. Kitts and Nevis. While achieving immediate social and environmental benefits for the country, through a better protected coastline the CARI-SKN project enables economic benefits from an enhanced and more sustainable tourism and fishery sector in the medium to long-term.

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

In designing the CARI-SKN project, paramount attention has been given to ensuring the sustainability of its outcomes, thereby extending their impact far beyond the conclusion of the project and the subsequent withdrawal of support from the AF. The project has been meticulously crafted to guarantee that its immediate achievements, such as coastal erosion prevention measures, and coral reef protection and rehabilitation interventions, yield lasting effects through strategic arrangements. While traditional physical infrastructure investments necessitate ongoing maintenance efforts beyond the scope of the project, ecosystem-based adaptation solutions, exemplified by coral reef restoration programs, demand continuous oversight, monitoring, and resource allocation to thrive over the long term.

Furthermore, the CARI-SKN project operates on multiple fronts to bolster the sustainability of its impact. It aims to dismantle institutional barriers and foster deeper cooperation in coastal zone management among governmental institutions, civil society entities, and the private sector. The project undertakes to enhance the capacities of key ministries, such as the Department of Environment and the Department of Marine Resources, thereby fortifying coordination and expertise to ensure sustained impact. A pivotal initiative involves the establishment of a novel Coastal Zone Management Committee, poised to infuse political impetus, expertise, and regulatory enforcement capabilities into coastal management efforts, thus securing enduring benefits across various domains of coastal zone management.

Concurrently, the CARI-SKN project endeavours to craft a comprehensive coastal management and Blue Economy framework for St. Kitts and Nevis, setting the stage for securing additional financing for critical resilient infrastructure and ecosystem protection measures. This project thrusts emphasis on fortifying monitoring infrastructure to continually generate valuable data, not only to inform future resilience endeavours within the region but also to furnish a blueprint for sustainable coastal management practices globally. Moreover, the CARI-SKN project lays the groundwork for long-term sustainability by spearheading political and regulatory reforms, bolstering data management capabilities, and establishing administrative structures crucial for scaling up coastal zone management and Blue Economy strategies post-project.

A cornerstone of the project's exit strategy involves the establishment of a Coastal Resilience Fund, intended as a long-term financing mechanism under Outcome 4. This innovative fund, structured around the concept of "payment for ecosystem services," draws from successful models practiced within the region. While detailed plans outlining the fund's structure are pending, its fundamental mandate is to cover the maintenance costs of coastal resilience projects in St. Kitts & Nevis, thus ensuring the continuity of ecosystem protection and rehabilitation efforts beyond the project's implementation period and the full utilization of AF resources. Through these concerted efforts, the CARI-SKN project endeavours to foster a legacy of resilience, sustainability, and environmental stewardship within St. Kitts & Nevis and beyond.

Specifically, sustainability, replicability and scaling up potential are ensured through:

I. A holistic and comprehensive framework approach, including the engagement of vital stakeholder groups, awareness, commitment, and political resources are set up for continuous support of the coastal resilience initiative.
II. Robust monitoring and data analysis tools demonstrate climate vulnerabilities to ecosystems and positive outcomes of interventions. Thus, making the social and economic value of ecosystems more visible to the public and private sectors.
III. The coastal zone management committee which is tailored towards the islands' circumstances and needs to implement coastal resilience projects. Instead of being stand-alone projects, activities of the committee’s secretariat establish procedures for prioritizing, planning, and financing coastal zone resilience projects.
IV. The coastal resilience financing mechanism ensures that the maintenance costs of project interventions are covered beyond the CARI-SKN project lifetime. Hence, long-term funding source of CARI-SKN project interventions will be a coastal resilience tax approach (e.g. tourism levy, an arrival tax for cruise ships, a tourism accommodation fee, a local usage fee of protected areas, or a corporate pollution tax).
V. The AF-supported project interventions will showcase well-monitored impacts and the efficient use of resources. Lessons learned can open the field to other funding resources, including private financing models to continue implementing much-needed coastal resilience projects in St. Kitts and Nevis.

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

This project includes activities with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures. Therefore, as per the initial screening of the project against the Environmental and Social Policy of the Adaptation Fund, it has been initially categorized as having a *Medium Risk* and falls within *Category B*.

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		**Project Risk:** i.) Legal and regulatory changes ii.) Permitting and licensing issues iii.) Litigation and legal disputes **Risk Level:** Medium **Impact:** Non-compliance with the law can have significant repercussions on the project, ranging from financial penalties and legal liabilities to reputational damage and project delays. Failure to adhere to relevant laws and regulations may result in fines, legal actions, or enforcement measures by regulatory authorities, leading to increased project costs and disruptions. Moreover, non-compliance can erode trust and credibility among stakeholders. Legal disputes and litigation arising from non-compliance issues can also consume valuable time and resources, diverting attention away from project objectives and impeding progress. **Next Steps:** Ensuring compliance with legal requirements is fundamental to the success of this project. Therefore, the development of the full funding proposal will involve conducting a thorough legal review to identify relevant law and integrate legal considerations into the project design, as well as establish compliance mechanisms and internal controls if necessary. By following these steps, the project can navigate legal complexities, mitigate risks of non-compliance, and ensure adherence to legal frameworks throughout its implementation.
Access and Equity		**Project Risk:** i.) Unequal Distribution of Benefits ii.) Limited Participation and Representation. **Risk Level:** Low **Impact:** Unequal distribution of benefits within the project could lead to social tensions and loss of trust among stakeholders. Marginalized groups may disengage, limiting innovation opportunities and damaging the project's reputation. Additionally, limited participation and representation could result in inadequate consideration of diverse perspectives and needs, leading to suboptimal project outcomes. It may also undermine community ownership and

		support, reducing the project's overall effectiveness and sustainability. **Next Steps:** Throughout the development of the full funding proposal, a comprehensive Environmental and Social Impact Assessment (ESIA) will be undertaken, alongside the development of an Environmental and Social Management Plan (ESMP), to thoroughly evaluate and propose strategies for mitigating any risks associated with *Access and Equity*. Building upon the outcomes of these assessments, mechanisms may be instituted to foster active stakeholder participation and equitable access to project benefits and resources for all stakeholders and local authorities. This inclusive approach will be complemented by beneficiary mapping efforts, which will ensure fair and equitable distribution of project benefits across communities.
Marginalized and Vulnerable Groups		**Project Risk:** I. Exclusion from project planning and decision-making processes **Risk Level:** Low **Impact:** Neglecting the needs and concerns of marginalized and vulnerable groups poses significant risks to the project's effectiveness and sustainability. Failure to address their specific challenges could lead to social tensions, loss of trust, and disengagement from key stakeholders. **Next Steps:** The proposed project prioritizes the equitable treatment of all community members, particularly those who are marginalized or vulnerable. To ensure their needs are effectively addressed, extensive stakeholder engagement and comprehensive social assessments will be conducted during the development of the full funding proposal. This will ensure that the specific needs and vulnerabilities of marginalized and vulnerable groups are captured in the final project activities.
Human Rights		**Risk(s):** I. Violation of Human Rights **Risk Level:** Low **Impact:** Human rights violations within the project could lead to legal challenges, public backlash, and reputational damage. **Next Steps:** The proposed project is committed to upholding and respecting all pertinent national legislation and international conventions pertaining to human rights throughout its implementation. Therefore, to guarantee rigorous adherence to human rights principles and standards, a thorough assessment of potential risks will be undertaken, and corresponding mitigation measures will be outlined within the Environmental and Social Management Plan (ESMP) as part of the full funding proposal. It is also worth noting that St. Kitts and Nevis generally has a positive human rights track record.[33] The country has ratified key international human rights treaties and has taken steps to uphold human rights domestically.
Gender Equality and Women's Empowerment		**Risk:** I. Gender disparities in decision-making and

[33] Saint Kitts and nevis 2021 Humann Rights Report.

		project benefits. II. Impact to livelihood of women and other vulnerable groups. **Risk Level:** Medium **Impact:** Gender disparities in decision-making and project benefits can lead to unequal distribution of resources, limited perspectives in planning and implementation, and reduced effectiveness of interventions. Additionally, it may perpetuate existing inequalities, hinder community participation, and undermine the project's overall impact and sustainability. **Next Steps:** The development of the full funding proposal**w**ill ensure informed engagement with Women's representaitves both at the levels of community and livelihoods initiatives**.**This form of engagement will help inform the evaluation of project gender risk and if any are identified, requisite mitigating measures will be proposed. The gender action plan will provide critical insights to inform targeted interventions and strategies aimed at fostering gender equality and empowerment. Specifically, all participatory and consultative processes will be designed to ensure the active representation of women's groups across communities, alongside gender experts, and non-governmental organizations (NGOs).
Core Labour Rights		**Risk(s):** I. Violation of workers' rights to fair wages and safe working conditions. II. Exploitation of labor, including forced labor or child labor, in project activities. III. Lack of access to grievance mechanisms for workers to address labor-related concerns. IV. Discrimination in employment practices based on gender, race, ethnicity, or other factors. V. Inadequate provision of health and safety measures for workers, leading to accidents or injuries. **Risk Level:** Medium **Impact:** The risks related to core labor rights pose significant challenges to the successful implementation of the project. Violations of workers' rights, including issues such as exploitation, discrimination, and lack of access to grievance mechanisms, can undermine the project's credibility and legitimacy. Such violations not only harm the well-being of workers directly involved but also contribute to social tensions and community unrest, potentially leading to delays, conflicts, or even project suspension. Additionally, negative publicity resulting from labor rights abuses can tarnish the reputation of the project sponsor or implementing agencies, impacting their ability to secure funding, partnerships, or support from stakeholders. **Next Steps:** The proposed project is committed to upholding core local and international labour laws and rights for all stakeholders involved. Therefore, during the development of the full funding proposal, a comprehensive assessment of risks related to core labour rights will be conducted, and appropriate mitigation measures will be established as necessary. These assessments and mitigation strategies will be integrated into the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) to ensure that labour rights are

		protected throughout the project's implementation.
Indigenous Peoples	St. Kitts and Nevis do not have any formally recognized indigenous groups within their population.	
Involuntary Resettlement	The proposed project components do not entail the displacement of individuals from their residences or land.	
Protection of Natural Habitats		**Risk(s):** I. Habitat destruction or degradation II. Habitat fragmentation III. Loss of habitat for various species **Risk Level:** Medium **Impact:** Habitat destruction or degradation, habitat fragmentation, and loss of habitat for various species can have significant socio-economic impacts on key sectors such as fisheries and tourism in the country. These sectors rely heavily on healthy and productive ecosystems to support their operations and generate revenue. Habitat destruction and fragmentation can lead to declines in fish stocks and biodiversity, reducing the productivity of fisheries and diminishing the quality of recreational opportunities for tourists. In turn, this can result in economic losses for coastal communities dependent on fishing income and tourism revenue. Furthermore, degraded habitats may detract from the aesthetic appeal of natural areas, potentially deterring tourists and affecting the tourism industry's viability. **Next Steps:** Based on the proposed activities in Component 3 of this project, it is necessary to assess the project's ecological footprint, potential disturbances to habitats, and impacts on various species. Therefore, during the development of the full funding proposal field surveys, ecological studies, and biodiversity assessments will be conducted to identify sensitive areas and species at risk. These assessments will be included in the ESIA and potential mitigation measures will be proposed in the ESMP. Additionally, consultation with environmental experts and stakeholders will be necessary to gather insights and perspectives on potential impacts and mitigation measures. Through these comprehensive assessments, the project will minimize negative impacts on natural habitats and biodiversity while maximizing conservation efforts and sustainable practices.
Conservation of Biological Diversity		**Risk(s):** I. Decreased biodiversity II. Increased risk of extinction for endemic or vulnerable species III. Disruption of ecosystem functions and services IV. Increased vulnerability to invasive species V. Altered trophic dynamics **Risk Level:** Medium **Impact:** The above risks could undermine the project's objectives by compromising ecosystem resilience, disrupting ecological balance, and diminishing essential ecosystem services. **Next Steps:** The proposed project is committed to ensuring

		that none of its interventions will result in significant or unjustified reduction/loss of biological diversity or facilitate the introduction of invasive species. To mitigate potential risks and safeguard biodiversity, all project activities will undergo thorough assessment through an ESIA, which includes specific parameters for biodiversity evaluation. This proactive approach aims to identify and address any potential impacts on biodiversity, thereby minimizing adverse effects and promoting the conservation of natural habitats and ecosystems throughout the project's implementation.
Climate Change		**Risk(s):** i. Increased Greenhouse Gas emissions **Risk Level:** Low **Impact:** Increased greenhouse gas emissions pose a reputational risk for the country and could undermine progress towards achieving its commitments under the Paris Agreement and Nationally Determined Contributions (NDCs). Failure to mitigate emissions effectively could lead to criticism from the international community and hinder the country's efforts to position itself as a responsible global citizen in addressing climate change. **Next Steps:** During the development of the full funding proposal, a comprehensive greenhouse gas (GHG) mapping assessment will be conducted to ensure that project interventions do not significantly contribute to GHG emissions. It is important to note that the proposed project aims to enhance St. Kitts and Nevis' resilience against climate change impacts while actively contributing to its adaptation and mitigation strategies. It is designed with stringent measures to avoid exacerbating greenhouse gas emissions or contributing to any factors driving climate change. Instead, the project prioritizes the implementation of sustainable practices and resilience-building initiatives that align with the country's climate action goals and commitments.
Pollution Prevention and Resource Efficiency		**Risk(s):** I. Contamination of coastal waters and ecosystems due to inadequate waste management practices. II. Accumulation of marine debris, including plastics and other non-biodegradable materials, leading to habitat degradation and harm to marine life. III. Diminished aesthetic value of coastal areas and recreational sites due to littering and pollution. IV. Inefficient use of limited natural resources **Impacts:** Inadequate waste management practices leading to contamination of coastal waters and ecosystems pose significant risks to the project, potentially compromising the health of marine habitats and water quality. Similarly, the accumulation of marine debris, particularly plastics and non-biodegradable materials, threatens coastal ecosystems by causing habitat degradation and harm to marine life. Moreover, the unsightly presence of litter and pollution diminishes the aesthetic appeal of coastal areas and recreational sites, potentially deterring tourists and recreational visitors, and adversely impacting local economies dependent on tourism revenue. Additionally, given the limited resources of St. Kitts and Nevis due to their small size,

		inefficient use of these resources further exacerbates these challenges, straining already vulnerable ecosystems and compromising their ability to withstand and recover from environmental stressors. These risks highlight the importance of effective pollution prevention measures and resource efficiency strategies to safeguard coastal environments and sustain socio-economic well-being. **Risk Level:** Low **Next Steps:** The project will adhere to both national and international standards to ensure optimal energy efficiency and minimize resource consumption, waste generation, and pollutant emissions throughout its design and implementation phases. These commitments will be detailed in the ESMP, providing comprehensive insight into the project's sustainable practices and environmental stewardship efforts.
Public Health		**Risk(s):** I. Health risks from marine pollution and toxins. II. Injuries from handling hazardous waste and marine debris. **Risk Level:** Low **Impact:** The public health risks associated with the project could lead to increased incidence of waterborne diseases and other health issues among coastal communities. This could strain local healthcare systems, reduce productivity, and lower the overall quality of life for residents. **Next Steps:** The proposed project is committed to safeguarding public health, ensuring that all activities and interventions are carried out with the utmost consideration for the well-being of local communities. This dedication to public health will be thoroughly assessed in the ESIA and outlined and expanded upon in the ESMP, providing a comprehensive overview of the measures and protocols in place to mitigate any potential risks or impacts on public health.
Physical and Cultural Heritage		**Risk(s):** I. Damage to cultural landmarks during project implementation. II. Disruption of traditional practices or cultural activities of local communities due to project interventions. III. Inadvertent destruction of important ecological or cultural sites due to lack of awareness or inadequate safeguards. IV. Loss of cultural identity or heritage values due to changes in the physical environment or socio-economic dynamics resulting from project activities. **Risk Level:** Low **Impact:** The risks associated with Physical and Cultural Heritage in the project encompass potential damage to community relations and trust, which could result in resistance or opposition to project activities. Moreover, there may be legal and regulatory challenges arising from non-compliance with heritage protection laws or international conventions, as well as negative publicity and reputational damage for the project sponsor or implementing agencies. Additionally, these risks could have long-term consequences on the cultural identity and heritage values of local communities, impacting their well-being and resilience in the process. **Next Steps:** The proposed project is dedicated to preserving

		both the physical and cultural heritage of the coastal communities it serves, a commitment that lies at the core of Components 2 and 3. Through these components, the project endeavours to bolster the adaptive capacity of these communities, equipping them to effectively tackle challenges such as coastal erosion and habitat degradation. However, it is imperative that additional assessments be conducted during project development to verify that project interventions do not result in any cultural or physical harm. These assessments will be included in the ESIA and if necessary, mitigation measures will be included in the ESMP.
Lands and Soil Conservation	The enhancement and enforcement of coastal zone policies through Component 1 of this project will strategically designate development zones to mitigate adverse impacts on land and soil conservation. Furthermore, under Component 3, the project will implement shoreline protection measures and beach erosion prevention efforts. These interventions are vital for conserving coastal land and soil, preventing erosion, and preserving soil integrity. By stabilizing the shoreline, maintaining coastal vegetation, and reducing sedimentation, the project will safeguard coastal ecosystems and infrastructure, while advancing sustainable land management practices.	

PART III: Implementation Arrangement

A. Demonstrate how the project aligns with the Results Framework of the Adaptation Fund.

Project Objective(s)[34]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Component 1: Government bodies strengthened their capacities regarding blue economy and		**Outcome 2:** Strengthened institutional capacity to reduce risks associated with	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from	USD $975,000.00

[34] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

ecosystem-based adaptation approaches and intergovernmental coordination and stakeholder dialogue are enhanced to mainstream coastal zone management into legislation and ensure effective enforcement of policies and regulations.		climate-induced socioeconomic and environmental losses.	targeted institutions increased.	
		Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level.	3.2. Percentage of targeted population applying appropriate adaptation responses.	
		Outcome 7: Improved policies and regulations that promote and enforce resilience measures.	7. Climate change priorities are integrated into national development strategy	
Comprehensive mapping and monitoring of coastal vulnerabilities as well as the analysis of coastal adaptation and climate resilience needs is strengthened to enable identification and planning of project interventions.		**Outcome 1:** Reduced exposure to climate-related hazards and threats.	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	USD $1,000,000.00
		Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	
		Outcome 8: Support	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Priority coastal adaptation measures to enhance the protection and rehabilitation of coastal ecosystems (and blue economy) as well as the resilience of coastal infrastructure are implemented, while the institutional mechanism is operationalized to ensure the scale-up potential.		**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Percentage of targeted population applying appropriate adaptation responses	USD $6,000,000.00
		Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.	5. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress	

		Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Financing mechanism for the maintenance (and potential financing) of coastal resilience measures is established.		**Outcome 3:** Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Percentage of targeted population applying appropriate adaptation responses	USD $400,00.00
		Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	
		Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
1.1: Relevant policies are revised and updated to integrate a coastal adaptation and needed strategies and plans specific to coastal zone management are developed, ready for implementation		***Output 7:*** Improved integration of climate-resilience strategies into country development plans.	7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	USD $750,000.00
1.2: A dedicated Coastal Zone Management Committee is established and operational		***Output 3.2:*** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge.	USD $150,000.00
1.3: Capacities of and coordination among		***Output 2.1***: Strengthened	2.1.2 No. of targeted institutions with	USD $75,000.00

government agencies and coastal communities are enhanced		capacity of national and sub-national centres and networks to respond rapidly to extreme weather events	increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	
2.1: Climate and Ocean Risk Vulnerability Index (CORVI) updated.		***Output 1.1:*** Risk and vulnerability assessments conducted and updated	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	USD $450,000.00
2.2: Improved coastal monitoring and data management systems to support Integrated Coastal Zone Management.		***Output 1.2:*** Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems.	USD $550,000.00
3.1: A coastal project implementation toolbox is developed to ensure structured, effective project implementation with sustainable impacts and meaningful up-scaling potential		***Output 8:*** Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	USD $150,000.00
3.2: Priority actions for bolstering coastal resilience are undertaken.		***Output 5:*** Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	USD $5,775,000.00

3.3: Lessons learned from project interventions collected and provided on dissemination platform		**Output 3.2:** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	USD $75,000.00
4.1: Develop a national 'payment for coastal resilience' (PCR) strategy and act, including a prioritization system for allocation of resources and monitoring framework.		**Output 7:** Improved integration of climate-resilience strategies into country development plans	7.2. No. of targeted development strategies with incorporated climate change priorities enforced	USD $150,000.00
4.2: Set-up of 'Coastal Resilience Fund' under the Ministry of Finance (GovSKN), which manages and allocates revenues from taxes under the PCR act.		***Output 8:*** Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.2. No. of key findings on effective, efficient adaptation practices, products and technologies generated	USD $200,000.00
4.3: Develop a PCR communication strategy, including local, regional and tourism-tailored communication		**Output 3.2:** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	USD $50,000.00

A. **Record of endorsement on behalf of the government**[2]

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

Mrs. Colincia Levine, *Permanent Secretary,* *Ministry of Environment, Climate Action and Constituency Empowerment*	Date*: 23/05/2024* 

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 proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans(National Climate Change Adaptation Strategy for Saint Kitts and Nevis and St. Kitts and Nevis' Nationally Determined Contributions to the UNFCCC) and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy and the Gender 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.

Mark Bynoe, PhD

Implementing Entity Coordinator

Date: *April 22, 2024*	Tel. and email: +592 620 0559 and mbynoe@caribbeanclimate.bz
Project Contact Person: Mr. Ryan Phillip	
Tel. And Email: +501 605 8078 and rphillip@caribbeanclimate.bz	

ST. CHRISTOPHER AND NEVIS
MINISTRY OF ENVIRONMENT, CLIMATE ACTION AND CONSTITUENCY EMPOWERMENT
UNIT C21 SANDS COMPLEX
BASSETERRE

Letter of Endorsement by Government

23 May 2024

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

Subject: Endorsement for Coastal Adaptation and Resilience Initiative – St. Kitts and Nevis (CARI-SKN)

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

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 Community Climate Change Center and executed by Ministry of Public Infrastructure et. al.

Sincerely,

Colincia Levine (Mrs.)
Permanent Secretary
Ministry of Environment, Climate Action and Constituency Empowerment

Annex 1

Preliminary Gender Analysis

Saint Kitts and Nevis Coastal Adaptation and Resilience Initiative – St. Kitts and Nevis (CARI-SKN)

Context

The 2022 Census Federation of St Kitts and Nevis has a population of 51,320 persons. This total represents an 8.7% increase over the 2011 census count of 47,195 persons[35]. There are more females than males with a sex ratio of 95.3. There are more females than males in most parishes including in Basseterre (the Capital City).

The Constitution sets the legal basis for gender equality. The country recognizes international conventions such as the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (accession in 1985) and Convention of Belem do Pará (became a party to in 1995)[36].

Saint Kitts and Nevis is classified by the UN As a high-income, high human development country.[37] In the past decade, the country's socio-economic position improved as reflected in statistical improvements in the standard of living, improvements in social services, and expanded social protection reach to households living in poverty[38]. The Country has a relatively high percentage of Female- headed households (over 40%). These households represent 57% of all households living in poverty. The Country Poverty Assessment however revealed that "while more women were poor, in the age category of sixty-five and older, there were more poor men than women"[39].

The National Gender Policy showed that there is income disparity between men and women. Women occupy the lowest-paid jobs and have lower labour force participation rates and higher unemployment rates.[40] The Gender wage gap is visible even within the private sector where it was highlighted in a study done by the Chamber of Commerce for ILO that women in managerial positions receive less pay than men in the same posts[41].

Within the fisheries sector, a key income earner in coastal communities, women are often in the lowest underpaid or informal, temporary, or part-time positions[42]. The Gender Policy and Action Plan for Saint Kitts and Nevis puts forward that women are unlikely to pursue loans for agriculture, fisheries, and related activities. Within coastal communities there are norms that dictate women's role in supporting fisheries but not going out to sea due to the perceived dangers involved[43]. These factors have implications for adaptive capacities to respond to climatic events.

The country's first Biennial Update Report (BUR) to the UNFCCC (United Nations Framework Convention on Climate Change) undertook an assessment of the current level of engagement regarding gender issues and social inclusion in climate change planning engagement and processes[44]. The BUR highlighted that … "women are more exposed and vulnerable to climate change because they are often poorer and are not involved in political and household decision making processes that affect their lives"[45]. The high number of female-headed households also means that the ability to cope and recover from climatic events has a disproportionately high impact on

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[35] Department of Statistics, The Population and Housing Census Summary Report Saint Kitts and Nevis, 2024

[36] GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

[37] GOSKN, Saint Christopher (St. Kitts) And Nevis Voluntary National Review Of 2030 Agenda for Sustainable Development, 2022

[38] *Ibid*

[39] Basch and Associates, Country Gender Assessment, 2014

[40] GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

[41] *Ibid*

[42] *Ibid*

[43] *ibid*

[44] GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

[45] Adapted from GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021
Ibid

women. The BUR puts forward that measures should consider the vulnerability and needs of female-headed low-income households[46]. Notwithstanding female vulnerability to climate impacts, it is worth nothing that older women often fare better than older men who live alone post disasters[47]. This is explained as being stemmed from men having multiple families in their youth, therefore being unable to form solid ties with these households[48].

Project Footprint

The major urban area of Saint Kitts is Basseterre (the Capital). The Project's major physical interventions will occur in the McKnight Cluster of communities (Basseterre area). The BUR identified that "while the population is concentrated in the capital and surrounding suburban areas, a considerable portion of the population is in coastal areas, with many villages located along coastal roads". [49] The presence of population centres along the coast enhances the vulnerability of St. Kitts and Nevis to the impacts of climate change. Coastal communities are socio-economically dependent on key sectors that are sensitive to climate impacts, such as tourism, agriculture, and fisheries. Coastal communities face risks from rising sea levels, coastal erosion, and extreme weather events which threaten their lives and livelihoods.

Much of the gender data for Saint Kitts and Nevis is not disaggregated at the community level. Additionally, there is a recognized paucity of detailed and up-to-date sex-disaggregated data on age, household composition, access to land and other factors of production, production activities and income of farmers and fishers[50]. This is a result of outdated approaches to data collection, analysis and management[51]. Therefore, general assumptions are made about roles, norms, and mores within coastal communities based on national level statistics. Further assessments using primary data collection instruments will allow for a deeper understanding of the gender context as it relates to care and productive roles within coastal communities.

Coastal community livelihoods are also bolstered by tourism. Within the tourism industry, there is segmentation of work based on gender (tour operators-Male, hospitality, and custodian staff-female). The national gender policy highlights that the Ministry responsible for tourism does not collate or use sex-disaggregated data on employment in the tourism sector (formal or informal) nor on specific issues for policy analysis such as gender pay gaps.[52] The range of activities proposed by the CARI-SKN project builds resilience to ensure continued periods of work, especially during peak seasons for all categories of tourism workers, including albeit without quantification informal employees within the sector.

Initial Stakeholder Consultations

Community feedback was captured in conducting the Road Sector Hazard Risk and Vulnerability Report which has informed this project's interventions. A Community Vulnerability Assessment (CVA) was undertaken in 2019 to collect data from the community on hazards, coping mechanisms, capacities and vulnerabilities and use this information to gain their perspective on how hazards can be mitigated. There were separate consultations with males and females within communities that supported identified gender differentiated needs and perceptions and solutions.[53].

The CVA identified that residences and businesses were at risk of being impacted by climatic events. Communities suggested a mix of approaches to reduce their vulnerability to hazards. These included *inter alia*[54]:

- Ecosystem Services (Soft engineering) – Utilize the natural protective barrier of coastal vegetation.
- Relocation – Businesses and residences in high vulnerability zones along the water's edge
- should be relocated out of harm's way

[46] GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

[47] Basch and Associates, Country Gender Assessment, 2014

[48] *Ibid*

[49] GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

[50] GoSKN, St Kitts and Nevis Agricultural Transformation and Growth Strategy 2022-2031, 2022

[51] *ibid*

[52] Adapted from GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

[53] CEAC SOLUTIONS LTD, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019

[54] Information sourced directly from CEAC Solutions Ltd, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019

- Early Warning System – installation of EWS along ghauts
- Training and awareness raising – These will assist in changing behaviours towards a culture
- of safety and awareness raising
- Hard infrastructure – Construction of coastal protection, drainage and landslide infrastructure works.

Gender Differentiated Climate Change Solutions within McKnight Cluster

The CVA identified that the climate changes most observed by women include sea level rise and temperature extremes, while men observed the impacts resulting from these occurrences such as flooding, droughts, forest fires, and water erosion.[55] Based on these identified hazards to communities, the following are recognized preferred solutions for adaptation differentiated by gender:

Table 1: Community Identified Solutions to Climate Vulnerabilities by Gender

Hazards	Sustainable Solutions (M)	Sustainable Solutions (F)
Hurricanes	Build effectively, education and adherence as well as running cables underground should, evolve into a system that incorporates building codes for hurricane preparedness and ongoing education.	Maintain properties so that they withstand hazards, manage waterways and move fishing equipment to higher ground. Resilient building construction, flood hazard maps and training and education on securing fishing equipment for fisherfolk.
Storm Surge	Improve storage areas and enforce building codes.	Build sea wall and secure fishing equipment
Flooding	Undertake drain clearing ahead of flooding, restrict building in flood prone areas and placing cables underground	Move equipment further inland or to higher ground and install flood hazard maps and early warning systems. The long-term goal is to cultivate an environment of education on securing equipment and early warning systems.

Source: Information adapted from CEAC Solutions Ltd, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019

Based on the women reports, vulnerability to hurricanes is associated with poor socio-economic conditions such as the need for shelters and loss of business[56]. Similarly, for women, "economic losses related to income, goods and employment are the primary drivers of vulnerability to storm surge in the community with loss of shore area and damage to fishing equipment being the immediate impacts arising from surge events. Secondary effects are observed as lack of access to roads and loss of income"[57]. Floods also result in damaged roads and houses resulting in displacement, disruption of school, emotional trauma, and lack of access to businesses[58].

Components 1,2,4

The CARI-SKN project will have national reach primarily through Components 1, 2 and 4. Gender equality is a fundamental aspect of integrated coastal zone management. However, there are recognised gaps in integrating inclusive and gender responsive approaches to coastal zone management, and assessment of climate vulnerabilities. In mapping and assessing climate risks on coastal areas, social and gender risks, and mapping should continue to be developed to ensure that vulnerable populations, including those who live and work

[55] *Ibid*
[56] *ibid*
[57] *ibid*
[58] *idib*

informally are not overlooked in broader sector analyses. Moreover, climate change highlights inequalities and the need for improved sex-disaggregated data collection and gender-sensitive coastal plans[59].

The BUR identified that the use of early warning systems (EWS), digital technologies and citizen science may be challenging where communities and households lack access to mobile phones or internet[60]. The BUR further highlights that priorities should be placed on ensuring that there are public access points (like schools, libraries, and internet cafes) for community members to access early warning systems and other climate-related information services. This aids in more adequate preparation and recovery from weather-related impacts and predicted longer term climate change effects or variability[61]. Considerations for social inclusion, particularly of the most vulnerable will need to be interwoven into the update of a national EWS. Importantly, further assessment is necessary to identify how the current EWS allows for improved access of the genders and vulnerable groups to timely and useful information.

Gender Equality Solutions CARI-SKN Project

The Approach of CARI-SKN should be aligned with recommendations from both the country's Gender and Climate Change Policies to ensure close integration of social and gender response in climate science activities. Additionally, there is a need to understand where different genders work along the value chain in the respective sectors to ensure that climate information services provide information that is useful to men and women along the sectoral value chains.

The project will prioritize inclusion of the Bureau of Gender, and representative Agencies for community affairs/social inclusion, within committees and discussion on coastal zone management systems, Early warning systems and financing mechanism for the maintenance of coastal resilience. This ensures that a social vulnerability lens is built into the conversation and considerations for coastal zone management at a national level and at the local level. Additionally, any technical support mechanism for aiding policy makers in understanding climate risks and economic sector resilience should incorporate a inclusion and gender responsive lens to ensure that sector resilience will consider socio-economic vulnerability and coping mechanisms. This in turn will inform public and private policy, planning and decision-making on climate sensitive sectors.

The Project will need to incorporate capacity development in the areas of gender and social inclusion. An understanding of how climatic vulnerability is overlayed by socio-economic vulnerability in coastal communities is important. A training programme for stakeholders in providing climate information services which considers the importance of gender sensitivity and social inclusion is required. Capacity building may also support improved integration of inclusive and gender responsive approaches to coastal zone management. Equally there is an expected gap in capacity to ensure that gender is mainstreamed in the activities subsumed under component 3- Strengthening coastal resilience and enhancing the protection and rehabilitation of coastal ecosystems. Gender training and support to the Ministry of Public Works is recommended to ensure inclusive and equitable application of component

[59] GEF, https://news.iwlearn.net/empowering-women-for-sustainable-coastal-management, accessed 11/07/2024

[60] GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

[61] *ibid*