

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: \$9,994,600.00 (in U.S Dollars Equivalent)

Project Formulation Grant Request: Yes ☒ No ☐

Amount of Requested financing for PFG: \$130,200

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: 2/18/2025

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 primary objective is to demonstrate transformative adaptation measures that protect communities from climate impacts threatening their livelihoods and safety. Additionally, the project emphasizes empowering local communities by establishing committees and strategies that enable them to design and implement coastal projects independently. By increasing the resilience of communities and ecosystems, these interventions will enhance their capacity to adapt to climate change, secure critical infrastructure, and improve socio-economic outcomes, fostering a more sustainable and prosperous future for Saint Kitts and Nevis. Through the successful implementation of these initiatives, the project seeks to directly benefit 32,500 individuals, approximately 60% of the national population, while an estimated 51,320 persons will indirectly benefit from the positive effects of project interventions on all sectors of the economy.

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

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

integrity and resilience. Escalating sea surface temperatures, ocean acidification, and intensified weather phenomena collectively imperil the delicate equilibrium of marine biodiversity.



Figure 1: Map of Saint Kitts and Nevis. (Source: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. Therefore, 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 which threatens infrastructure, livelihoods, and economic stability.

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

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

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, has 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.

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

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

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.

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.

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

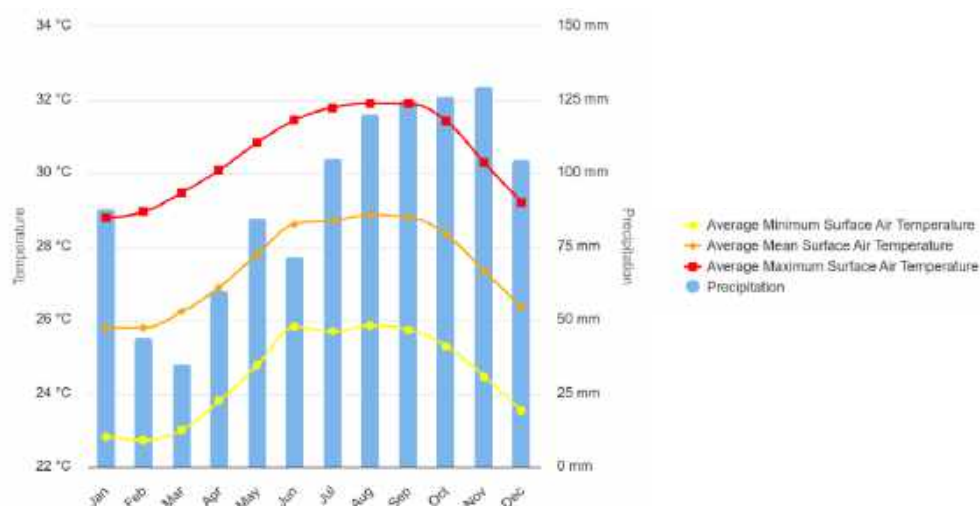


Figure 2: Monthly climatology of Average Minimum Surface Air Temperature, Average Mean Surface Air temperature, Average Maximum Surface Air Temperature & Precipitation in St. Kitts and Nevis spanning 1991-2020. (Source: World Bank Climate Knowledge Portal)

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.

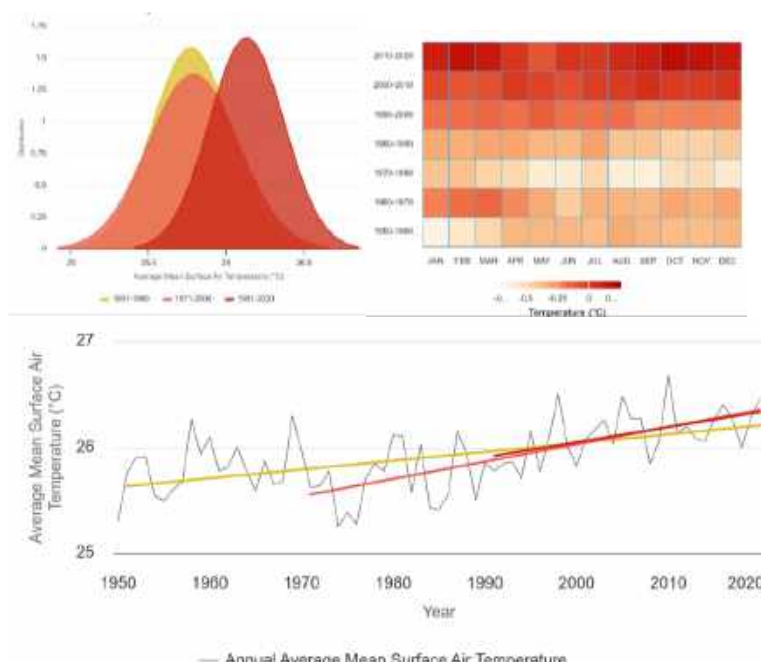


Figure 3: (i) Change in distribution of average mean surface air temperature, (ii) Changes in Average surface Air Temperature Anomaly, and (iii) Observed variation in Average surface Air Temperature in St. Kitts and Nevis, 1950-2020. (Source: World Bank Climate Knowledge Portal)

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.

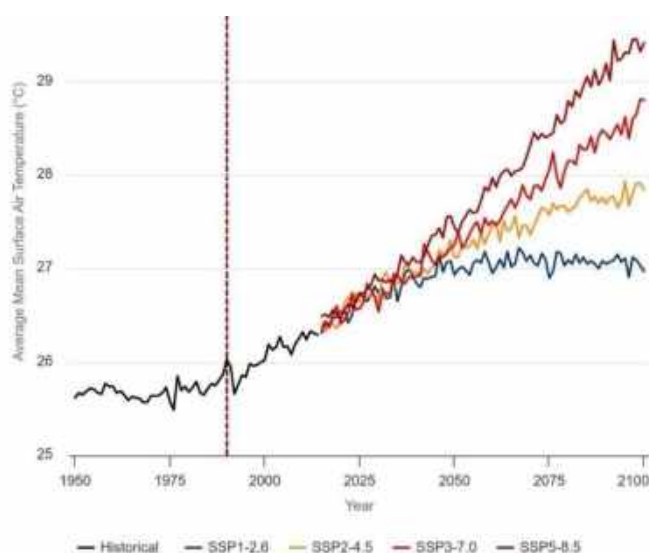


Figure 4: Projected Average Mean Surface Air Temperature St. Kitts and Nevis, Ref. Period: 1995-2014. (Source: World Bank Climate Knowledge Portal)

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.

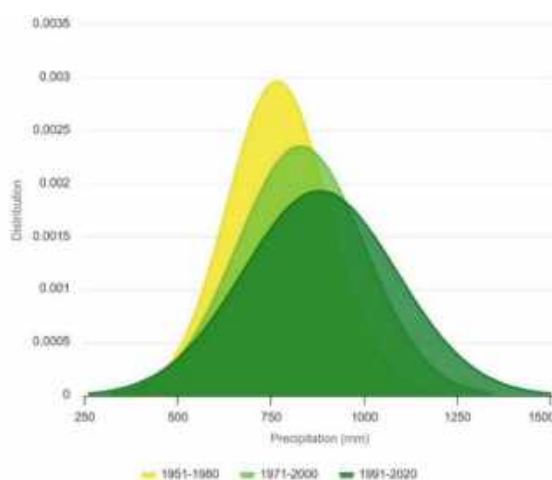


Figure 5: Change in distribution of average annual mean precipitation in St. Kitts and Nevis. (Source: World Bank Climate Knowledge Portal)

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.

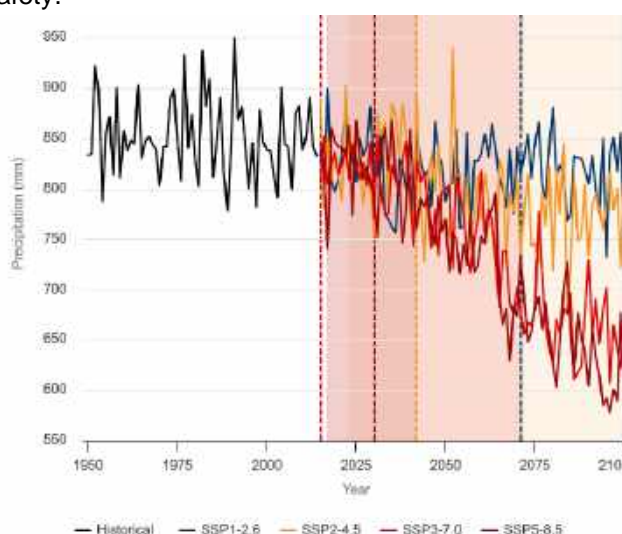


Figure 6: Projected departure from natural variability of precipitation in St. Kitts and Nevis. (Source: World Bank Climate Knowledge Portal)

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 coastal erosion and flash floods, posing significant threats to the islands' densely populated coastline and economy.

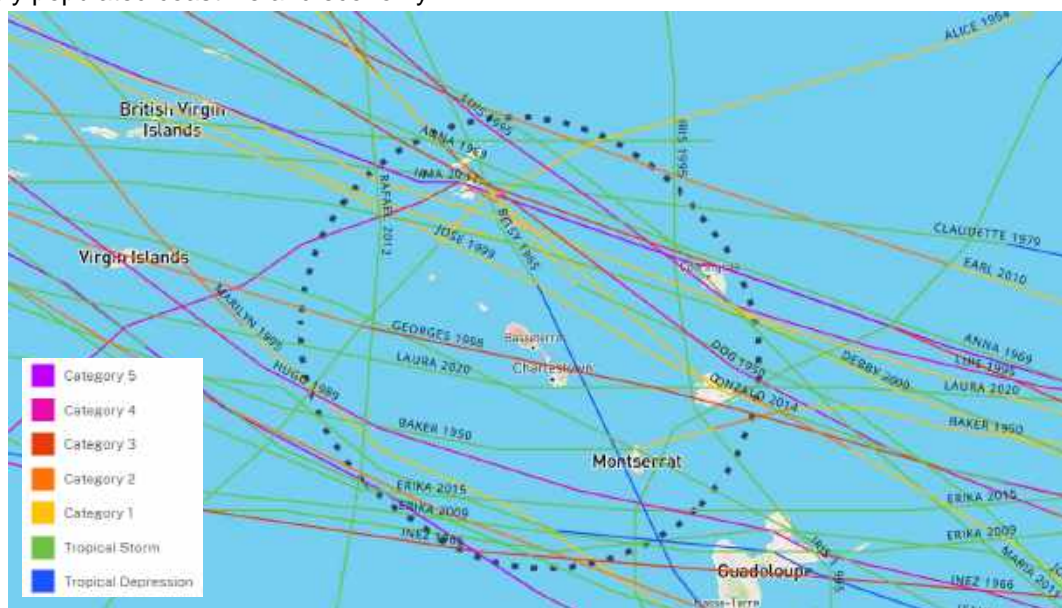


Figure 7: Tropical Cyclone and Hurricane tracks within 60 nautical miles of Saint Kitts and Nevis from 1970 – 2022. (Source: NOAA, Historical Hurricane Tracks)

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: Overview of economic and non-economic loss and damage due to extreme events in St. Kitts and Nevis

Extreme Event	Economic loss and damage (total estimated damages, USD)	Non-economic loss and damage (non-exhaustive)
Hurricane Hugo, 1989	\$41 Million	1 death, heavy shoreline erosion, cases of gastro-enteritis due to poor water quality
Hurricane Luis, 1995	\$197 Million	Soil erosion
Hurricane Georges, 1998	\$445 Million	5 deaths, ~3,000 people displaced from their homes
Hurricane Jose, 1999	\$3.8 Million	
Hurricane Lenny, 1999	\$41.9 Million	Coastal erosion, loss of personal effects, ~100 people displaced from their homes
Hurricane Omar, 2008	\$11 Million	54 people displaced, coastal erosion
Hurricane Earl, 2010	\$3 Million	Beach and coastal erosion
Subtropical Storm Otto, 2010	\$20.1 Million	Beach erosion
Hurricane Irma, 2017	\$19.7 Million	
Hurricane Maria, 2017	\$7.9 Million	Beach erosion, eroded cliffs, salt water intrusion into fresh water supply

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).

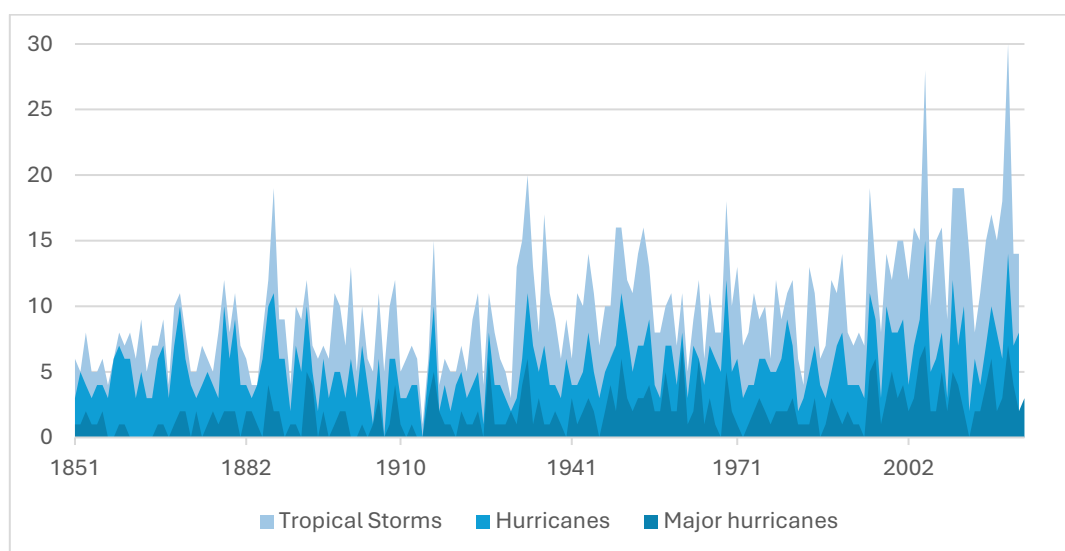


Figure 8: Total Number of Tropical Cyclones, Hurricanes, and Major Hurricanes Passing Through the North Atlantic Basin (1851-2022)

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

⁹ Climate Trends and Projections for the OECS Region, 2021

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

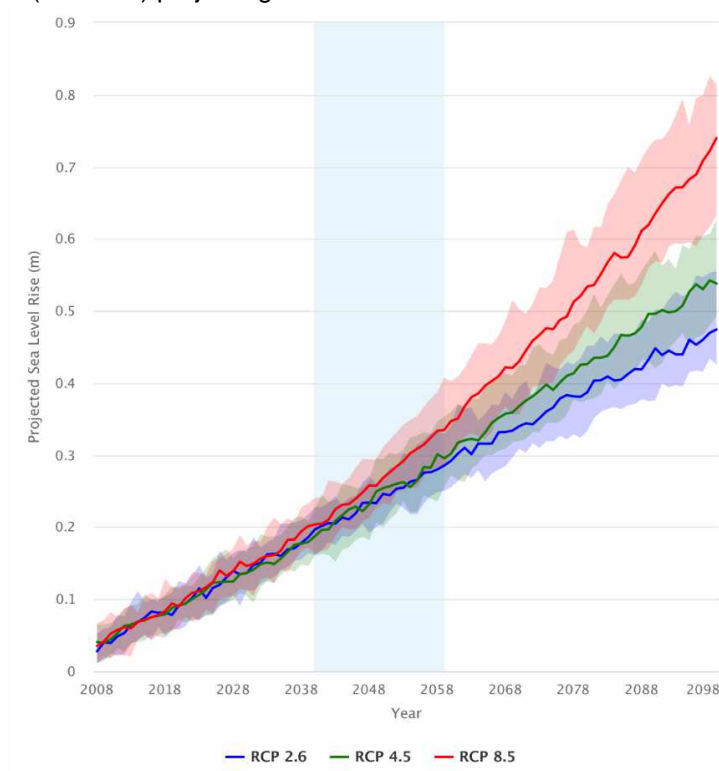


Figure 9: Projected Sea Level Rise along the coast of St. Kitts and Nevis under different scenarios. (Source: World Bank Climate Knowledge Portal)

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.

¹⁰ Climate Change Knowledge Portal (World Bank), 2024

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 CO₂ emissions, future SST trends in the Antilles and the wider Caribbean are expected to 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.

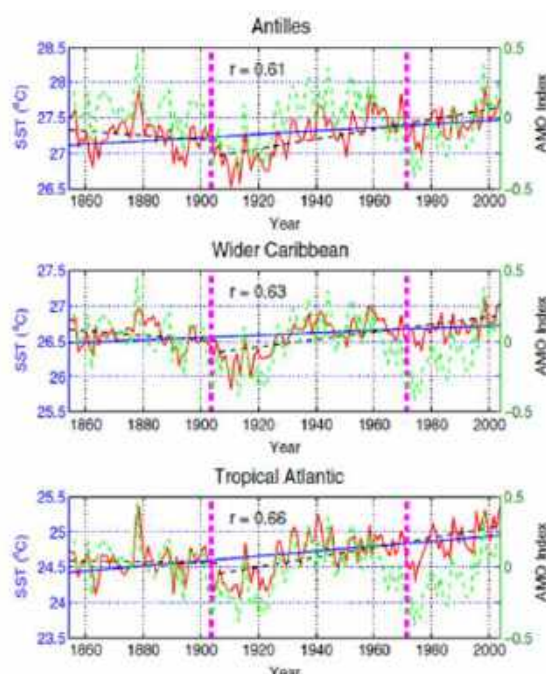


Figure 10: Annual area average of SST from observations for three tropical north Atlantic regions for the period 1854-2005.

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.

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

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

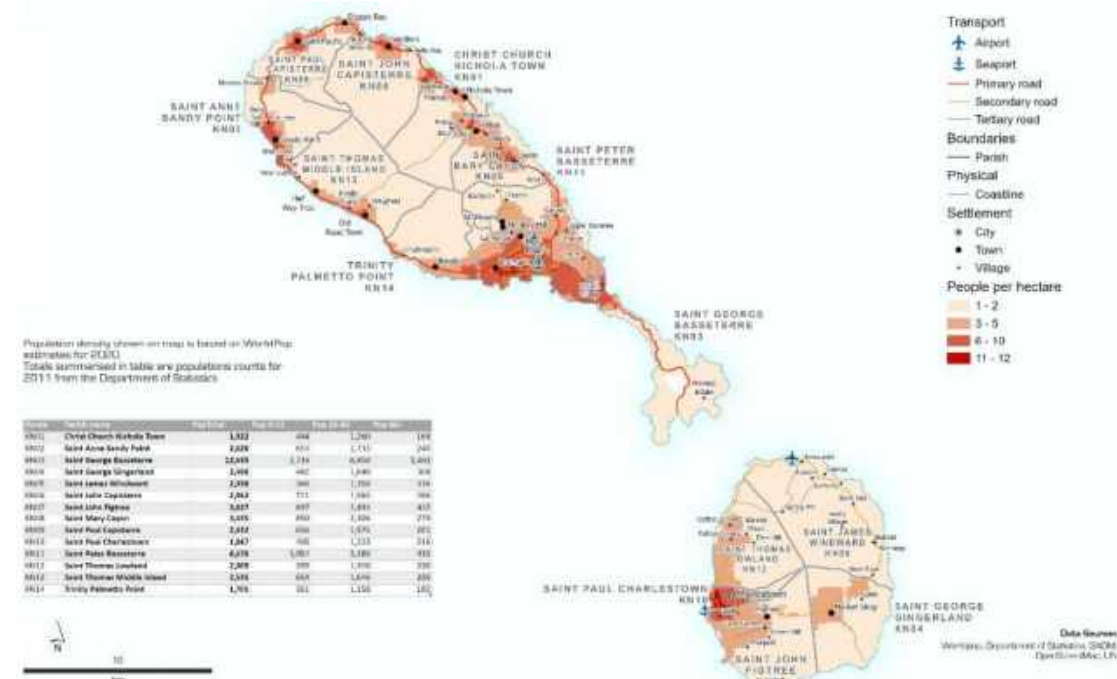


Figure 11: Population Density map for St. Kitts and Nevis.

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 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.

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

¹³ Urban Resilience Plan for Greater Basseterre, 2022

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

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

Table 2: 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 Nevis¹⁵, the Multi-hazard Risk Assessment for St. Kitts and Nevis¹⁶, the Climate and Ocean Risk Vulnerability Index (CORVI) Project¹⁷, and the Report of the vulnerability and capacity assessments in coastal and fishing communities in Saint Kitts and Nevis¹⁸. 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. 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 stipitacea 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

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.>

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



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

Currently, there is limited data on the condition of the coastline, particularly with respect to nearshore and onshore activities. By conducting a thorough mapping of coastal assets, the country can establish a baseline dataset for comparative analysis with data collected through a regular monitoring system. 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 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.

3. Project Rationale and Justification

The justification for the Coastal Adaptation and Resilience Initiative in Saint Kitts and Nevis is driven by the urgent need to safeguard lives and livelihoods, as well as protect the islands' natural ecosystems from escalating climate change impacts. Coastal communities in this small island nation are particularly vulnerable to the combined effects of sea-level rise, coastal erosion, and increasingly frequent and severe storms. These climate-related challenges have not only caused extensive damage to infrastructure and ecosystems but have also placed a heavy financial burden on the country, hindering long-term sustainable development.

Over the past 20 years, Saint Kitts and Nevis has expended over 1 billion dollars USD in climate-related recovery efforts, averaging approximately \$43 million per year. This cost is significant, representing a substantial percentage of the country's Gross Domestic Product (GDP) each year. This recurring financial outlay has severely strained national resources, diverting funds away from critical development initiatives and leaves the country in a constant state of recovery. The need for recovery after each climate event has undermined the country's ability to achieve steady economic growth and meet broader development goals, as resources that could otherwise be used for adaptation efforts are continually redirected toward rebuilding efforts. Therefore, the CARI-SKN project will include critical measures such as the construction of a coastal revetment system in Irishtown, which has been identified as a highly vulnerable area. Irishtown's coastline, which is impacted almost annually, faces significant risks from erosion, storm surges, and rising sea levels, endangering nearby infrastructure, ecosystems, and livelihoods. The implementation of a well-engineered revetment will stabilize the shoreline, reduce the rate of erosion, and serve as a protective barrier against future climate-related impacts, offering a sustainable solution to a long-standing issue in this community.

Despite efforts to integrate climate change considerations into national policies, the institutional capacity of Saint Kitts and Nevis to address the growing complexity and interconnectedness of climatic risks remains insufficient. The island faces overlapping challenges such as sea-level rise, coastal erosion, extreme weather events, and ecosystem degradation, which often exacerbate one another, creating cascading impacts on infrastructure, livelihoods, and natural resources. Limited financial and human resources, fragmented governance systems, and insufficient technical expertise further hinder the ability to implement and monitor critical adaptation measures. Coordination between government agencies and stakeholders is weak, and existing policies lack the comprehensive, data-driven approaches needed to address these interlinked risks effectively. In response to these challenges, this project seeks to establish a Coastal Zone Management Committee to improve inter-agency coordination and stakeholder engagement, ensuring an integrated approach to coastal resilience. Additionally, the project will develop an Integrated Coastal Zone Management (ICZM) Strategy and Plan to provide a cohesive framework for addressing the multifaceted impacts of climate change. This strategy will guide sustainable adaptation efforts, incorporating both scientific and local knowledge to protect ecosystems and communities. By addressing governance gaps and enhancing institutional capacity, the initiative aims to equip the country with the tools needed to proactively manage coastal risks and build long-term resilience.

The project will also strengthen Saint Kitts and Nevis's capacity to address future climate challenges by enhancing data monitoring, conducting vulnerability assessments, and improving knowledge management. Given increasingly unpredictable weather patterns, intensifying storms, and rising sea levels, robust climate data and effective knowledge-sharing mechanisms are essential for informed decision-making. By building stronger data systems and conducting targeted assessments, the government will be better equipped to identify at-risk areas, prioritize adaptation measures, and allocate resources effectively. Additionally, the project will generate and disseminate practical knowledge products, such as reports and policy briefs, to foster learning and collaboration across sectors. These efforts will support evidence-based interventions, improve coordination among stakeholders, and strengthen the country's ability to access international climate finance, ensuring long-term resilience and sustainable development.

In conclusion, this project is vital for breaking the cycle of recovery and rebuilding, allowing Saint Kitts and Nevis to proactively mitigate existing vulnerabilities, rather than merely reacting to each climate event. By focusing on building resilience and reducing risks before they materialize, this initiative will enable the country to safeguard its natural and human resources, ensuring long-term sustainable development. Through integrated adaptation measures, strengthening of institutional capacity, and alignment with international climate commitments, this project will provide a model for other SIDS and contribute to global efforts to build climate resilience in vulnerable regions.

4. Barriers and Root Causes Addressed by the Project

4.1. Limited Technical and Institutional Capacity for Coastal Zone Management.

Barrier analysis has revealed significant challenges related to the limited technical and institutional capacity for Coastal Zone Management (CZM) in St. Kitts and Nevis. Coordination among government agencies is insufficient, with fragmented responsibilities and weak inter-agency collaboration. This lack of alignment further complicates the effective integration of climate change considerations, ecosystem-based adaptation, and disaster risk reduction strategies into national legislation, regulations, and policies. At the ministerial and departmental levels, there is a notable absence of shared resources and mechanisms for effective policy implementation and management, which hinders the country's ability to respond to coastal resilience challenges in a coordinated manner. The Nationally Determined Contributions (NDC) report highlights that less than 50% of the coastal adaptation actions identified in the National Climate Change Adaptation Strategy (NCCAS) have been incorporated into annual operational plans or successfully implemented. This gap is largely due to limited financial resources, as well as a significant shortage of skilled human resources dedicated to carrying out these actions. Additionally, the country lacks a comprehensive, dedicated management regime to regulate, monitor, and enforce coastal zone activities, which further exacerbates the problem. Specifically, the Department of Environment in St. Kitts and the Department of Physical Planning and Environment in Nevis are under-resourced and unable to effectively track and assess the progress and impacts of adaptation measures. These institutional and technical capacity gaps create a substantial barrier to the effective management of the coastal zone and the sustainable implementation of climate adaptation actions.

4.2. Insufficient Awareness and Knowledge of Coastal Climate Vulnerabilities.

Insufficient awareness and knowledge of coastal climate vulnerabilities in St. Kitts and Nevis represent a significant barrier to effective coastal zone management and climate adaptation. A critical factor in shaping robust policies and ensuring their enforcement is the availability of reliable, detailed data on the local impacts of climate change. However, Saint Kitts and Nevis faces notable gaps in this area, with limited data on the specific vulnerabilities of coastal communities, ecosystems and infrastructure. The absence of a comprehensive database and mapping mechanisms to identify and assess coastal risks hinders the government's ability to accurately gauge the extent of climate impacts, such as sea-level rise, coastal erosion, and increased storm frequency and intensity. Where vulnerability assessments exist, they have typically been narrow in scope, focusing on specific sectors or communities rather than examining how external factors may compound vulnerabilities. This segmented approach fails to address the interconnectedness between social and environmental vulnerabilities, leaving gaps in understanding how climate risks impact community resilience and ecosystem health collectively. Moreover, where vulnerabilities are well understood, the information is not consistently shared at the community or non-institutional level. This lack of transparency and communication limits the ability of communities to recognize and respond proactively to climate risks. Without access to knowledge about local vulnerabilities, communities cannot fully participate in decision-making or take advantage of adaptation resources, leaving them unprepared for climate impacts such as storm surge, coastal and coastal flooding.

A major issue contributing to this gap is the lack of cohesive data management and sharing across key government entities. Currently, climate and environmental data are fragmented across different ministries and departments, such as the Department of Marine Resources, the Department of Environment, the Department of Environmental Health, and the St. Christopher Air and Sea Ports Authority (SCASPA). These departments collect valuable information on coastal ecosystems, such as beach erosion, mangrove health, and coral reef degradation, but the data remains siloed, making it difficult to form a comprehensive picture of the nation's coastal vulnerabilities. Additionally, there is a lack of integrated systems to monitor and track ongoing changes in coastal ecosystems, such as beach erosion, mangrove degradation, and coral reef health, as well as to conduct post-storm impact assessments. The Government of St. Kitts and Nevis also faces challenges in linking national data collection efforts with regional and international platforms, which could improve access to broader climate and environmental data. This gap in data sharing and collaboration undermines the capacity to develop informed, context-specific adaptation strategies that are aligned with global best practices and

regional priorities. Without robust data collection and monitoring systems, the country is unable to make informed decisions or implement adaptive measures that adequately address the

To effectively build resilience and protect vital coastal resources, St. Kitts and Nevis must enhance its data infrastructure by integrating data management across departments, establishing comprehensive monitoring systems, and improving linkages with regional data platforms. A robust, unified data approach will empower decision-makers to assess climate vulnerabilities holistically and implement adaptive measures that are responsive to the complex, interlinked nature of social and environmental risks faced by coastal areas.

4.4. Financial Constraints for Coastal Adaptation Initiatives.

Financial constraints represent a significant barrier to the successful implementation of coastal adaptation initiatives in St. Kitts and Nevis. While some vulnerabilities within the country's coastal zones are well-documented, there is a clear lack of financial resources required to undertake the necessary adaptation actions. This gap in funding is compounded by the absence of structured investment planning tools, which are crucial for mobilizing capital for climate action. St. Kitts and Nevis also faces challenges in effectively engaging the private sector and aligning private and public sector resources to address climate vulnerabilities in a coordinated manner. The absence of robust financial instruments, such as climate bonds or green financing mechanisms, further exacerbates the situation by limiting access to affordable funding for vital coastal protection measures and the development of climate-resilient infrastructure. Moreover, the lack of comprehensive data on the financial risks associated with climate change, along with the absence of clear risk assessment frameworks for sustainable investments, creates additional barriers to securing investment. Without these key components, it is difficult for potential investors, both public and private, to evaluate the long-term viability and benefits of coastal adaptation projects, leading to limited financial flows into the sector. Furthermore, the high upfront costs of adaptation measures, such as coastal defences and ecosystem restoration, deter investment due to perceived risks and long-term return uncertainties. To address these financial challenges, St. Kitts and Nevis needs to attract new funding structures, such as concessional finance, which can help reduce the risks associated with climate adaptation investments. These structures, combined with innovative and collaborative partnerships (particularly with international donors, development banks, and the private sector) will be essential for mobilizing the capital needed to finance large-scale adaptation projects. Establishing clear mechanisms for sustainable investment and building capacity to assess climate-related financial risks are also critical for creating a more conducive environment for financing coastal resilience and ensuring that adaptation measures are implemented at the scale required to safeguard the country's coastal ecosystems and communities.

4.4. Inadequate Mechanisms for Knowledge Sharing and Learning.

Inadequate mechanisms for knowledge sharing and learning represent a substantial barrier to effective coastal zone management and adaptation in St. Kitts and Nevis. Communication about coastal vulnerabilities, adaptation needs, and management approaches is essential for successful climate resilience efforts, yet the country faces significant gaps in this area. Key stakeholders, particularly those involved in coastal adaptation initiatives, are not adequately engaged or coordinated, which hinders the development of integrated, multi-sectoral strategies for resilience. The absence of a structured knowledge-sharing framework limits the dissemination of best practices, data, and lessons learned from past initiatives among decision-makers, local communities, and relevant institutions. This lack of cohesion in coastal zone management efforts leads to missed opportunities for synergies across sectors and weakens overall adaptation planning. Moreover, public awareness and access to disaster risk reduction measures, including insurance and sustainable coastal management practices, remain insufficient. Many coastal communities, especially those with limited resources that rely heavily on coastal and marine ecosystems for their livelihoods, are not fully aware of the risks they face or the tools available to mitigate those risks. The absence of targeted education and outreach leaves these communities vulnerable to climate impacts, as they are often less equipped to manage coastal hazards such as flooding, erosion, and storm surges. This educational gap is further compounded by a lack of resources to support locally led solutions that could serve as natural defences against climate impacts and promote long-term coastal resilience. To address this barrier, St. Kitts and Nevis must prioritize the creation of comprehensive knowledge-sharing platforms and community engagement strategies. These

should aim to boost public awareness of climate risks and adaptation options, facilitate the use of disaster risk reduction tools, and ensure the active involvement of all stakeholders, particularly vulnerable communities, in coastal zone management processes. By enhancing access to educational resources on coastal adaptation solutions and encouraging stakeholder engagement, local communities can be empowered to participate in and benefit from sustainable coastal management practices that will contribute to the country's long-term climate resilience.

5. Project Objectives

The Coastal Adaptation and Resilience Initiative for Saint Kitts and Nevis (CARI-SKN) aims to establish a robust coastal zone management framework that anticipates and addresses both current and future climate challenges facing the nation (see Annex 2). Recognizing the country's acute vulnerability as a Small Island Developing State (SIDS), CARI-SKN targets key barriers to effective coastal zone management, including limited technical and institutional capacity, insufficient awareness of coastal climate vulnerabilities, financial constraints, and the lack of mechanisms for knowledge sharing and collaboration. To comprehensively remove these barriers, and address current and future coastal climate vulnerabilities, the CARI-SKN project comprises four components:

Outcome 1 focuses on establishing and strengthening a Coastal Zone Management Committee to enhance governance and coordination for effective coastal adaptation and management.

Outcome 2 aims to improve coastal risk analysis and monitoring systems to support informed decision-making and enhance adaptation efforts through better data management.

Outcome 3 focuses on implementing a critical coastal adaptation measure along the Irishtown Bay Road, to strengthen community resilience and protect vital infrastructure from the impacts of storm surge, coastal erosion, and sea level rise.

Outcome 4 focuses on developing a knowledge management system to facilitate learning and sharing of best practices in coastal adaptation and protection.

Collectively, these four outcomes will help St. Kitts and Nevis build long-term resilience to climate impacts by strengthening institutional frameworks, fostering data-driven decision-making, implementing practical and prioritized adaptation actions, and supporting knowledge exchange. By addressing these critical components, the CARI-SKN project will empower local stakeholders, protect vital coastal resources and infrastructure, and equip the nation to better manage the evolving challenges posed by climate change.

6. Project Components and Financing

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Improved Institutional Coordination and Governance for Coastal Zone Management	1.1: A dedicated Coastal Zone Management Committee is established and operational.	The establishment and operationalization of a dedicated Coastal Zone Management Committee, strengthened with the necessary technical and organizational capacity, to effectively implement an Integrated Coastal Zone Management (ICZM) Strategy and Action Plan.	\$120,000.00
2. Strengthened Data Management and Monitoring for Coastal Zone Adaptation.	2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making. 2.2: Improved coastal monitoring and data	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	\$ 1,150,000.00

	management systems to support Integrated Coastal Zone Management.	future coastal adaptation interventions.	
3. Priority Coastal Adaptation Measures for Community Protection and Resilience Implemented.	3.1: Shoreline Protection and Resilience Enhancements for Basseterre Bay Road.	The implementation of shoreline protection measures along the Bay Road in Basseterre to ensure long-term resilience of the area.	\$7,000,000.00
4. Knowledge Management Systems for Coastal Adaptation and Protection Improved.	4.1: Enhanced learning and knowledge management systems.	The development of an enhanced knowledge management system that improves learning, facilitates the sharing of best practices, and strengthens coastal adaptation efforts through the creation and dissemination of knowledge products.	\$200,000.00
6. Project Execution cost			\$804,650.00
7. Total Project Cost			\$9,274,650.00
8. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			\$719,950.00
Amount of Financing Requested			\$9,994,600.00

Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	March 2026
Mid-term Review (if planned)	August 2028
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.

Outcome 1: Improved Institutional Coordination and Governance for Coastal Zone Management

This component is central to the Technical Assistance (TA) provided by the CARI-SKN project and is focused on strengthening the political and regulatory framework for integrated coastal zone management (ICZM). This enhancement has become critical, as the current framework in St. Kitts and Nevis does not fully account for the present and escalating climate risks affecting coastal zones, leaving the country extremely vulnerable to climate change impacts. The existing approach to managing these risks has been fragmented, with responsibilities divided across multiple ministries and departments, resulting in siloed efforts that limit effective coordination and, at times, has led to maladaptive actions. To address these issues, this component will begin with the establishment a Coastal Zone Management

(CZM) Committee, which will serve as a central coordinating body for integrated coastal zone management. The committee will oversee the development and implementation of an ICZM Strategy and Action Plan which will be informed by the vulnerability assessments conducted under Component 2.. This plan will provide a cohesive approach to managing climate risks, aligning efforts across sectors and ensuring that adaptation measures are informed by the latest insights into local vulnerabilities. Additionally, the technical capacity of the committee will be strengthened through a comprehensive assessment of current gaps, equipping it with the tools and knowledge needed to address the complex challenges of coastal adaptation. Through increased collaboration, stakeholder engagement, and knowledge-sharing, this component aims to empower local stakeholders to implement effective and sustainable coastal adaptation measures. These efforts will collectively enhance the climate resilience of St. Kitts and Nevis by protecting its coastal ecosystems and securing its most vulnerable populations against the mounting impacts of climate change. Through these initiatives, *Outcome 1* will lead to the following:

Alignment with AF Results Framework:

1. *Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses*
2. *Outcome 7: Improved policies and regulations that promote and enforce resilience measures*

Output 1.1: A dedicated Coastal Zone Management Committee is established and operational.

Activity 1.1.1: Establish a technical Coastal Zone Management Committee.

Establishing a technical Coastal Zone Management Committee has been identified as a high-priority action in both the National Climate Change Strategy and the 2023 Readiness Needs Assessment Report and Action Plan for St. Kitts and Nevis. This Committee will play a crucial role in strengthening the institutional capacity for coastal zone management by creating a unified and coordinated approach to managing climate risks. The Committee will comprise a diverse blend of members from government agencies, the private sector, non-governmental organizations (NGOs), and civil society organizations (CSOs). This cross-sectoral representation will bring together a wealth of perspectives and expertise which will foster a holistic approach to coastal management that balances economic, social, and environmental needs. As part of its establishment, the Committee will be equipped with a formal mandate and detailed Terms of Reference (ToR), outlining its responsibilities, operational framework, and specific goals. These will include providing technical guidance, promoting cross-departmental collaboration, supporting locally led coastal adaptation initiatives, and recommending best practices for sustainable coastal zone management. Moreover, this activity will also focus on drafting legislation and regulatory frameworks to formalize the establishment and governance structure of the Committee. These legal and regulatory instruments will provide the necessary authority and operational clarity for the Committee, ensuring its long-term effectiveness and sustainability in managing coastal zone risks. With a clear mandate and legislative backing, the Committee will play a central role in streamlining decision-making and implementing the Integrated Coastal Zone Management (ICZM) Strategy and Action Plan which will be developed in Activity 1.1.2. By leading the rollout of priority actions identified in the ICZM Strategy, the Committee will drive coordinated, data-driven responses to climate change impacts, ultimately enhancing the protection of coastal communities and ecosystems against future climate-related risks.

Activity 1.1.2: Develop an Integrated Coastal Zone Management Strategy and Action Plan.

Developing an Integrated Coastal Zone Management (ICZM) Strategy and Action Plan has emerged as a critical short-term priority in St. Kitts and Nevis, as highlighted in the country's National Climate Change Adaptation Strategy. St. Kitts and Nevis faces significant climate related challenges along its coastlines, which are vital to its economy, communities, and natural ecosystems. Coastal areas support major tourism assets, transportation networks, fisheries, and residential communities, making them highly vulnerable to sea-level rise, increased storm frequency, coastal erosion, and other climate impacts. Given the economic and social reliance on these coastal zones, the ICZM Strategy and Action Plan is essential to protect the country's critical resources and foster resilience in the face of intensifying climate threats. The ICZM Strategy will create a structured framework for managing coastal zones sustainably, integrating environmental, economic, and social considerations. The development of the

ICZM Strategy and Action Plan will be spearheaded by the Coastal Zone Management Committee, established under Activity 1.1.1. This committee will lead a collaborative process involving a wide range of stakeholders. These include representatives from key government agencies such as the Departments of Environment, Fisheries, Agriculture, Tourism, and Infrastructure, as well as local government bodies, community members, private sector actors, and civil society groups. This inclusive approach ensures that the strategy reflects diverse perspectives and expertise, enabling it to address the specific needs and vulnerabilities of different coastal communities. By incorporating the most recent data on vulnerabilities, coastal assets, and community needs, the plan will prioritize adaptation actions that address the specific risks faced by different coastal communities. This approach will balance the immediate need for protective infrastructure with longer-term strategies, such as habitat preservation and sustainable land use planning, to maintain the integrity of coastal ecosystems that naturally mitigate climate impacts. A key component of the ICZM Strategy will be the inclusion of a financing strategy for priority adaptation interventions. This financing strategy will identify potential funding sources, partnerships, and mechanisms that can support the implementation of high-impact projects identified in the Action Plan, allowing St. Kitts and Nevis to secure necessary investments for building coastal resilience. Through this holistic approach, the ICZM Strategy will not only provide a roadmap for reducing current and future climate vulnerabilities but will also position St. Kitts and Nevis to better access climate adaptation finance. This is vital for implementing the on-the-ground interventions needed to protect lives, livelihoods, and ecosystems.

Activity 1.1.3: Build the technical and organisational capacity of the Coastal Zone Management Committee.

To strengthen the technical and organizational capacity of the newly established Coastal Zone Management Committee, an initial capacity assessment will be conducted to pinpoint specific skill and knowledge gaps within the team. Following this assessment, a series of tailored training workshops will build expertise in key areas such as coastal zone monitoring, climate adaptation planning, risk assessment, and project development/management. By equipping committee members with these essential competencies, the initiative aims to foster a cohesive, skilled body prepared to drive effective coastal management and address complex climate-related challenges in St. Kitts and Nevis. Ultimately, these efforts will empower the Committee to guide the nation's integrated coastal zone management initiatives, ensuring that policies and actions are informed, coordinated, and sustainable.

Outcome 2: Strengthened Data Management and Monitoring for Coastal Zone Adaptation.

This Outcome significantly enhances St. Kitts and Nevis's capacity for climate change adaptation planning and responding effectively to extreme climate events that threaten coastal communities and ecosystems. 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 i) fragmented data collection/management systems, ii) insufficient monitoring capabilities and iii) 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 (Table 1) 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 to be collected 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 data management and monitoring capacities will feed into Output 1.1 and support the work of the established Coastal Zone Management Committee. This integration ensures that the data collected and

analysed will directly inform adaptive management strategies, and resilience-building efforts. 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, *Outcome 2* will lead to the following:

Alignment with AF Results Framework:

1. Outcome 1: Reduced exposure to climate-related hazards and threats

Output 2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making.

Activity 2.1.1: Conduct Coastal Asset Mapping.

This activity will focus on creating a comprehensive inventory of coastal assets along the shorelines of St. Kitts and Nevis, encompassing both natural and built features that are crucial to the community, economy, and environment. Natural assets, such as coral reefs, mangroves, beaches, and wetlands, will be mapped due to their vital role in providing ecosystem services like coastal protection, biodiversity support, and carbon sequestration. Built assets, including critical infrastructure like roads, bridges, seaports, and coastal housing, will also be included as they are essential for economic activities and the well-being of local communities. To ensure the accuracy and detail of this mapping effort, an integrated approach will be adopted, combining advanced remote sensing technologies with hands-on field surveys. High-resolution satellite imagery and Geographic Information Systems (GIS) will be used to capture a broad overview of coastal assets and their spatial distribution. Specifically, LiDAR (Light Detection and Ranging) technology will be utilized to create detailed three-dimensional models of coastal infrastructure and landscapes, capturing precise elevation data, structural dimensions, and terrain changes. This technology will provide an accurate understanding of where built assets are situated relative to potential flood zones, erosion-prone areas, and other climate-related hazards. For natural assets benthic and bathymetric surveys will be conducted to assess underwater features, depths, and the health of submerged assets such as coral reefs and seagrass beds. These surveys will provide essential data on the structure and extent of these underwater environments, helping to assess their vulnerability and potential for recovery. In addition to remote sensing techniques, field-based surveys will involve local community members, ensuring the inclusion of local knowledge, particularly for mapping built assets. Involving local community members in mapping exercises, particularly in their home communities, will foster a deeper connection to the coastal environment and enhance data accuracy through local knowledge. Moreover, local community participation in these mapping exercises will not only contribute to the accuracy of the inventory but also raise awareness about the value of coastal assets and the need for their protection. By incorporating community members in the mapping process, the activity will build sustainability by empowering residents to take an active role in safeguarding their coastal environments and infrastructure. The data gathered through this activity will serve as a critical resource for the Coastal Risk and Vulnerability Analysis conducted in Activity 2.1.2 and the CORVI to be updated in Activity 2.1.3.

Activity 2.1.2: Integrated Vulnerability Assessment of Coastal Communities in St. Kitts and Nevis.

A comprehensive vulnerability assessment of coastal communities in St. Kitts and Nevis will be conducted to evaluate both the socio-economic risks and physical vulnerabilities these areas face due to climate change. The assessment will cover all 13 coastal communities that are located within 2 km of the coastline. These communities include: Sandy Point, Old Road, Conaree, Frigate Bay, Trinity, Halfway Tree, Dieppe Bay, and Saddlers in St. Kitts as well as Charlestown, Newcastle, Cotton Ground, Vaughans, and Camps in Nevis. These communities have also been selected based on socio-economic factors, the extent of coastal development, and their reliance on the coastal environment for local livelihoods. This assessment will provide an in-depth analysis of exposure to climate hazards, including extreme weather events, sea-level rise, flooding, and coastal erosion, with a focus on how these risks impact both the infrastructure and the communities that rely on it. This activity will benefit from the data and insights generated in Activity 2.1.1, which includes detailed bathymetric and LiDAR surveys, as well as asset risk exposure categorization. These foundational studies will provide high-resolution spatial data on the coastal environment, such as the structure and extent of submerged assets (e.g., coral reefs and seagrass beds) and the topography of coastal infrastructure. The LiDAR surveys will offer detailed 3D models of built assets and terrain, helping to map vulnerable areas accurately, while

the bathymetric data will support storm surge and coastal erosion modelling. High-resolution digital elevation models (DEMs) will also be incorporated to map flood-prone zones accurately. These tools will allow us to model the spatial extent and depth of inundation under different storm and sea-level rise scenarios, providing a clear picture of which areas and assets are most vulnerable to these threats. The assessment will combine both qualitative and quantitative approaches, including surveys, interviews, and community consultations, to capture insights from residents, community leaders, and stakeholders. This participatory approach will ensure that the lived experiences of those most affected are central to the analysis. Socio-economic factors such as income levels, access to essential services, and housing conditions will be integrated into a vulnerability index to create a layered understanding of risk. Key local livelihoods will also be examined for climate sensitivity, given their heavy reliance on stable and resilient coastal environments. Critical infrastructure such as transportation, water supply, and health services will be assessed for exposure and adaptive capacity to ensure that community vulnerabilities and infrastructure weaknesses are both addressed in targeted adaptation strategies. The findings from this comprehensive analysis will form the basis for the development of locally tailored strategies for climate resilience, to be included in the Integrated Coastal Zone Management (ICZM) action plan developed in Activity 1.1.1. By identifying and documenting community-level vulnerabilities with data-driven clarity, this assessment will enhance the ability of St. Kitts and Nevis to secure climate adaptation finance and drive effective resilience-building efforts.

Activity 2.1.3: Update the Climate and Ocean Risk Vulnerability Index (CORVI) for Enhanced Risk Profiling.

The Climate and Ocean Risk Vulnerability Index (CORVI) will be updated to enhance risk profiling for coastal communities in St. Kitts and Nevis. While a CORVI profile has already been completed for the capital city of Basseterre in 2022, no other communities have undergone similar assessments since. The Basseterre CORVI assessment has been instrumental in identifying critical vulnerabilities and guiding priority adaptation measures within the city. Building on this success, the updated CORVI will expand the analysis to include all 13 coastal communities located within 2 km of the coastline, providing an island-wide risk assessment. These communities include: Sandy Point, Old Road, Conaree, Frigate Bay, Trinity, Halfway Tree, Dieppe Bay, Saddlers, Basseterre, Charlestown, Newcastle, Cotton Ground, Vaughans, and Camps. The data collected through Activity 2.1.1 and Activity 2.1.2 will serve as foundational inputs for the updated CORVI. These activities will provide valuable information on the vulnerability of coastal communities by identifying socio-economic risks, critical assets, and exposure to climate hazards. This data will ensure that the updated CORVI assessment is comprehensive and accurately reflects the diverse challenges faced by coastal populations across St. Kitts and Nevis. The updated CORVI analysis will provide a more complete understanding of climate and ocean risks across St. Kitts and Nevis, addressing key sectors like coastal infrastructure, livelihoods, and community well-being. The comprehensive risk profiles generated will inform integrated policy solutions, guide resource allocation, and help secure climate investment for the most vulnerable communities. By using the updated CORVI as a data-driven tool, the country will strengthen its ability to plan for and respond to the impacts of climate change, ensuring that adaptation strategies are tailored to the most urgent needs.

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

Activity 2.2.1. Develop a National Coastal Monitoring Network.

The National Coastal Monitoring Network aims to establish comprehensive data coverage across both islands to address existing gaps in coastal and marine monitoring. Currently, monitoring activities are largely limited to Basseterre and conducted by the St. Christopher Air and Sea Ports Authority (SCASPA) as part of seaport operations. In addition to SCASPA's monitoring at the main seaport, various ministries and departments, including the Department of Physical Planning, Department of Environment, and Department of Environmental Health, conduct irregular monitoring activities across different sites, contributing to a fragmented understanding of coastal and environmental conditions. Due to the sparse distribution of monitoring efforts across the islands, key oceanic and weather data remain unavailable for many regions. Therefore, this system will expand monitoring capacity to encompass a broader geographic scope and temporal resolution to ensure data collection across vulnerable areas and enable a thorough understanding of oceanic variations that impact the islands' coastal and marine ecosystems. To achieve this, the system will incorporate a range of advanced monitoring technologies

strategically placed to provide detailed, high-resolution data. Tide gauges will be positioned at multiple locations to monitor sea-level fluctuations and provide early warnings for coastal flooding due to storm surges, high tides, and rising sea levels. This data will be critical for understanding the local impacts of climate change on coastal communities and informing adaptive measures. An upgraded network of offshore weather stations will also be deployed, capturing meteorological variables such as air temperature, humidity, wind speed, and precipitation. These stations will enhance the existing inland network and create a complete picture of climate conditions affecting coastal and marine environments which will support both real-time forecasting and historical climate analysis. Specialized oceanographic instruments, including Conductivity, Temperature, and Depth (CTD) profilers, will be utilized to measure the salinity, temperature, and depth of surrounding waters. These measurements will provide essential insights into water chemistry, temperature dynamics, and seasonal changes, aiding in assessments of ocean health and the impacts of warming on marine life and ecosystems. Additionally, Acoustic Doppler Current Profilers (ADCPs) will be strategically located in shallow and deep-water zones to track ocean currents and sediment transport. This will enable precise monitoring of sediment movement patterns, offering valuable data for managing coastal erosion and understanding how storm events impact sediment flows, which are vital for coastal stability and habitat protection. To address water quality, both fixed and mobile sensors will be placed in sensitive coastal zones, such as popular beaches, fishing grounds, and areas near critical marine habitats. These sensors will measure dissolved oxygen, salinity, turbidity, nutrients, pH, and contaminants, providing continuous water quality assessments to protect marine biodiversity and safeguard public health. Together, these instruments will deliver comprehensive water quality data, helping detect pollution sources, seasonal fluctuations, and the effects of land-based activities on marine resources. All data from these instruments will be fed into the centralized data server which will be created under Activity 2.2.2. This database will be equipped with a robust network infrastructure to ensure real-time data access, efficient storage, and processing capabilities. By consolidating these inputs, the system will enable decision-makers to access high-quality, timely data critical for adaptive coastal management and climate resilience.

To enhance data richness and support long-term sustainability, the network will incorporate a Community-Based Data Collection Program with a strong focus on citizen science initiatives. These programs will engage residents, particularly in areas frequently used by the community, such as beaches and fishing zones, where they can play an active role in monitoring water quality and other ocean conditions. Training and simple data collection tools will be provided to community members under Activity 2.2.3, enabling them to contribute to this national monitoring effort. Additionally, the Clarence Fitzroy Bryant College will leverage this network to integrate real-world monitoring experiences into its environmental science curriculum. Students will participate in data collection and monitoring activities as part of their coursework. This academic involvement not only strengthens the data pool but also educates future environmental stewards in practical coastal management techniques. By establishing this island-wide monitoring network and integrating community involvement, this initiative will improve the capacity of St. Kitts and Nevis to assess, respond to, and manage its unique coastal challenges. This approach aligns with the country's national climate adaptation goals which have a strong focus on empowering women, youth, and marginalised communities to actively engage in resilience-building efforts.

Activity 2.2.2. Standardize Data Collection Methods and Enhance Database Management.

To support reliable and accessible coastal monitoring across St. Kitts and Nevis, this initiative will standardize data collection methods and enhance database management capabilities. Currently, data collection practices vary, resulting in inconsistencies that complicate effective monitoring and analysis. Establishing uniform protocols will ensure data compatibility across all monitoring sites, aligning with international standards and improving data reliability. A centralized database management system will also be implemented to organize and store data gathered from various sources, including the National Coastal Monitoring Network outlined in Activity 2.2.1. This system will provide easy access, sharing, and analysis capabilities for government agencies, researchers, and stakeholders, supporting informed, evidence-based decision-making. By improving data consistency and accessibility, the initiative aims to reinforce adaptive coastal management, enhance long-term monitoring quality, and support sound policy development for coastal resilience.

Activity 2.2.3. Conduct Capacity Building for Coastal Monitoring Stakeholders.

This activity will deliver a series of targeted training workshops for over 120 local stakeholders actively involved in coastal zone monitoring in St. Kitts and Nevis. These sessions will equip them with the skills needed to effectively use the new national coastal monitoring system and adopt the standardized data collection methods established. The sessions will be tailored to diverse groups, including personnel from the Department of Environment, the Department of Physical Planning, the Department of Marine Resources, SCASPA, and other local government officials with responsibilities in coastal management and environmental monitoring. The workshops will also target technical staff from relevant agencies, academic institutions like the Clarence Fitzroy Bryant College, community leaders in coastal areas, and representatives from NGOs engaged in environmental protection and disaster risk reduction. With the introduction of advanced equipment such as tide gauges, CTD profilers, Acoustic Doppler ADCPs, and water quality sensors, the workshops will ensure that all users have the knowledge and technical competence to operate, interpret, and manage the technology and data effectively. Each session will cover essential topics, including system functionality, data interpretation and visualization, troubleshooting, and best practices for achieving consistent and accurate data collection. By building local capacity to manage and maintain the monitoring infrastructure, this activity will enable stakeholders to independently leverage data for coastal planning, ecosystem management, and early warning systems. The practical skills gained through this initiative will foster sustainable, long-term coastal zone monitoring, enhance resilience to climate impacts, and empower stakeholders to make data-driven decisions that protect coastal communities, ecosystems, and local economies.

Outcome 3: Priority Coastal Adaptation Measures for Community Protection and Resilience Implemented.

This Outcome focuses on implementing essential coastal adaptation measures to protect the Irishtown Bay Road shoreline, which is centrally located in the country's capital city of Basseterre. The Irishtown Bay Road area was prioritized for intervention following a 2019 criticality assessment conducted by CEAC Solutions²². This assessment, based on a multi-criteria analysis, evaluated the vulnerability and importance of the island's main roads and categorized the Irishtown Bay Road as "catastrophic." This classification reflects its extreme susceptibility to damage and its vital socio-economic role as a key transportation corridor. The 550-meter-long roadway is an indispensable lifeline for St. Kitts and Nevis, situated within a 1 km radius of critical national infrastructure, including the main seaport, the national agricultural market, and the only tertiary-level college in the federation. Through the assessment, the proposed intervention is also deemed to be extremely cost-effective and will bring significant savings to the government and local communities by reducing damage and associated recovery costs. Its strategic location makes it essential for facilitating the movement of goods and services, ensuring access to education, and supporting economic activities such as trade, tourism, and agriculture. However, the road's proximity to the coastline has made it increasingly vulnerable to the impacts of climate change. Severe storms, rising sea levels, and intense rainfall in recent years have caused significant erosion and damage to the road and its surrounding area. The impacts of these events extend beyond physical damage. They have disrupted transportation networks, hindered access to essential services, and adversely affected local businesses, resulting in widespread economic repercussions. For nearby communities, the consequences are even more profound. Residents often bear the burden of physically demanding and emotionally draining tasks, such as clearing debris and undertaking emergency repairs to maintain connectivity. These repetitive cycles of damage, cleanup, and repair strain local resources and intensify feelings of vulnerability and helplessness among the affected population. Therefore, the government has prioritized the Irishtown Bay Road for intervention because the projected benefits for local communities far exceed those of other areas assessed during the study. The road's centrality and its role as a conduit for economic and social activities mean that safeguarding it will have far-reaching positive effects. Shoreline protection measures will reduce exposure to climate hazards, safeguard critical infrastructure, and alleviate the socio-economic and emotional burdens placed on local communities. By securing this vital link, the intervention will ensure continued access to essential services, strengthen regional connectivity, and support the resilience and prosperity of St. Kitts and Nevis.

²² CEAC SOLUTIONS LTD, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019



Figure 14: An impassable and severely damaged Irishtown Bay Road in the aftermath of Hurricane Omar (2008)

In response to these challenges, Outcome 3 of the CARI-SKN project focuses on strengthening the resilience of the Irishtown Bay Road through targeted measures to protect its shoreline from future climate impacts. The process begins with a detailed site assessment to identify the specific vulnerabilities and environmental conditions that contribute to the shoreline's susceptibility to coastal erosion and storm surges. Based on the findings, customized shoreline protection solutions will be designed, integrating both ecological sustainability and the needs of the local community. These solutions may include physical barriers, natural buffers, or engineered reinforcements to fortify the shoreline against future climate hazards. By implementing these measures, the project aims to reduce the frequent need for costly repairs and alleviate the emotional burden placed on the community. Protecting the Basseterre Bay Road shoreline will also ensure continued access to vital services and infrastructure, reduce the impact of climate risks on the local economy, and provide long-term relief to residents who are burdened by the aftermath of every climate event. Ultimately, these efforts will contribute to a more resilient and sustainable future for the region, enhancing both the economic stability and the well-being of its people. Successful implementation of Component 3 leads to the following Outcome:

Alignment with AF Results Framework:

1. Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets.

Output 3.1: Shoreline Protection and Resilience Enhancements for the Bay Road in Irishtown, St. Kitts.

Activity 3.1.1. Conduct a Detailed Site Assessment for Shoreline Protection along the Irishtown Bay Road in Basseterre, St. Kitts.

A comprehensive site assessment for shoreline protection along the 550-metre-long Bay Road shoreline will be conducted to build upon the preliminary work done by CEAC in 2019, which identified shoreline rehabilitation as the most feasible adaptation option (Table 2). This assessment will involve updating a series of technical surveys, including beach profile surveys, nearshore bathymetry, and wave transformation analyses, to better understand the dynamics of wave patterns and their impact on shoreline stability. Sediment transport and shoreline change modelling will also be utilized to predict the movement of sand and sediment along the coastline, providing valuable insights into long-term shoreline changes. In addition to assessing coastal factors, the evaluation will examine inland risks such as flooding and other environmental hazards that may affect the area's resilience. The assessment

will also consider surrounding environmental conditions, including the role of vegetation, marine ecosystems, and human activities, in either enhancing or diminishing the resilience of the area. This activity is particularly necessary because, in 2010, the government attempted to secure the shoreline; however, the lack of a detailed assessment led to an unsuccessful intervention, resulting in wasted resources. By integrating both environmental and socio-economic considerations, the assessment will offer a holistic understanding of the vulnerabilities along the Irishtown Bay Road and the surrounding communities. This will guide the development of tailored, sustainable shoreline protection measures aimed at enhancing the resilience of both the coastline and local infrastructure.

Table 3: Summary of Multi-Criteria Analysis (Source: CEAC (2019))

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 3.1.2. Design Shoreline Protection Solutions for the Irishtown Bay Road in Basseterre, St. Kitts.

Detailed engineering designs for shoreline protection along the Irishtown Basseterre Bay Road will be developed based on the findings from the comprehensive site assessment conducted in Activity 3.1.1. The goal of this activity is to create robust and sustainable solutions that will mitigate the risks posed by coastal erosion, storm surges, and sea-level rise, ensuring the long-term stability of the shoreline and surrounding infrastructure. The engineering designs will incorporate a range of protection strategies tailored to the specific needs of the Irishtown Bay Road shoreline, considering the unique environmental conditions, vulnerability factors, and community requirements identified during the assessment phase. The design process will integrate both structural and natural approaches to shoreline protection. Drawing from successful interventions at other sites in the country, such as Old Road Bay, this

assessment will consider the potential use of a steel-reinforced cantilever retaining seawall combined with an armoured stone revetment. This combination has proven effective in enhancing coastal resilience and is recognised by stakeholders as an accepted method for shoreline protection. In addition, the designs will also address the potential for flooding, accounting for inland water flow and drainage patterns to ensure that any protection measures do not inadvertently exacerbate other environmental risks. Furthermore, the engineering solutions will prioritize sustainability, ensuring that the interventions are environmentally compatible, cost-effective, and resilient to the projected climate impacts over the coming decades. The designs will be developed in close consultation with local stakeholders, ensuring that the proposed solutions align with community needs and priorities while minimizing disruption to local businesses, residences, and ecosystems. This approach will offer a durable and impactful solution for Basseterre Bay Road, ensuring long-term resilience to coastal hazards.

Activity 3.1.3. Implement Shoreline Protection Measures along the Bay Road.

The implementation of shoreline protection measures along Basseterre Bay Road focuses on translating the engineered designs produced in Activity 3.1.2 into effective, on-the-ground solutions to safeguard the shoreline and surrounding communities. This involves the construction and installation of various protective structures, including seawalls, revetments, and groynes, as well as the establishment of natural buffers like vegetation restoration, depending on the specific design needs. The work will prioritize minimizing environmental disruption by ensuring that construction methods are sustainable and compatible with the local ecosystem. Efforts will also be made to preserve marine life, protect the adjacent beach, and maintain biodiversity. In addition to the shoreline protection itself, the implementation will address inland flooding risks by enhancing drainage systems and potentially incorporating flood barriers. These measures aim to provide comprehensive protection for both the road and the surrounding areas, ensuring the safety and resilience of the infrastructure. The implementation of these measures will also support local job creation, providing employment opportunities throughout the construction process. Furthermore, the use of locally available natural resources will be prioritized, enhancing sustainability and promoting the use of materials that are familiar to the community. Local communities and stakeholders will be actively engaged throughout the process to ensure that the solutions meet their needs and minimize negative impacts. Ultimately, the completed protection measures will strengthen the resilience of Basseterre Bay Road, securing long-term protection for the shoreline, local economy, and the communities that depend on it.

Outcome 4: Knowledge Management Systems for Coastal Adaptation and Protection Improved.

Coastal adaptation projects are inherently challenging due to the dynamic nature of the land-sea interface, which increases the complexity of developing effective adaptation solutions. The constant interaction between land and sea, influenced by factors such as sea-level rise, coastal erosion, and extreme weather events, requires highly adaptable and context-specific approaches. These challenges necessitate highly adaptable and context-specific approaches, making it difficult to track the effectiveness of coastal zone management (CZM) initiatives over time. One of the most significant barriers to successful adaptation is the lack of robust knowledge management systems to monitor, evaluate, and disseminate information on what works in these complex environments. Without structured systems for capturing and sharing knowledge, lessons learned from previous initiatives can remain inaccessible or fragmented, preventing the replication of successful strategies and the avoidance of common pitfalls.

This output will address these challenges by enhancing learning and knowledge management systems to support coastal adaptation efforts. It will establish frameworks that systematically monitor and evaluate the impact of Integrated Coastal Zone Management (ICZM) initiatives and provide structured avenues for knowledge sharing. By creating robust knowledge management and dissemination systems, it will overcome the barrier of inaccessible or fragmented knowledge on best practices and lessons learned from past projects. This will empower stakeholders with the information needed to replicate successful strategies and avoid common pitfalls, particularly in dynamic coastal settings.

The development of a comprehensive monitoring, evaluation, and learning (MEL) framework will allow for tracking the progress and outcomes of coastal adaptation projects, ensuring that adaptive management strategies are in place. This framework will focus on key areas such as coastal resilience,

ecosystem protection, and community engagement, providing the necessary data for continuous improvement. Furthermore, documenting lessons learned and best practices from existing ICZM initiatives will offer valuable insights for other Small Island Developing States (SIDS) facing similar challenges. The knowledge compiled into accessible reports, fact sheets, and multimedia content will be shared regionally, fostering greater collaboration and innovation in coastal adaptation efforts.

Through these enhanced systems, this output will help overcome barriers to effective coastal zone management by facilitating the sharing of knowledge, improving decision-making, and fostering a regional network of SIDS committed to building resilience and protecting vulnerable coastal communities from climate change impacts.

Alignment with AF Results Framework:

1. Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level

Output 4.1. Enhanced learning and knowledge management systems

Activity 4.1.1. Develop an MEL Framework for Knowledge Management

This activity involves the development of a comprehensive Monitoring, Evaluation, and Learning (MEL) framework designed to track and assess the implementation of activities related to Coastal Zone Management (CZM), particularly those outlined in the Integrated Coastal Zone Management (ICZM) Strategy and Action Plan. The framework will establish a set of clear indicators and gender disaggregated performance metrics for each action in the ICZM plan, allowing for the systematic collection of data on progress, outcomes, and challenges. It will also define the methodologies and tools for monitoring the success of CZM interventions, including but not limited to shoreline protection, coastal resilience measures, and community engagement efforts. Through regular evaluations and feedback mechanisms, the MEL framework will ensure adaptive management, enabling the project to adjust its approach based on emerging needs and lessons learned. This framework will provide a comprehensive mechanism for assessing the impact of ICZM strategies on coastal ecosystems, infrastructure, livelihoods, and resilience, helping to inform future coastal management decisions and promote sustainable practices.

Activity 4.1.2. Knowledge Sharing and Dissemination of ICZM Best Practices

In alignment with the priorities outlined in the National Climate Change Adaptation Strategy, this activity focuses on documenting and disseminating lessons learned, best practices, and innovations from past and ongoing Integrated Coastal Zone Management (ICZM) initiatives in St. Kitts and Nevis. The government of St. Kitts and Nevis has recognized the importance of knowledge sharing among Small Island Developing States (SIDS) as a key strategy for addressing climate change challenges. Therefore, this initiative will involve the creation of a range of knowledge products, including detailed reports, fact sheets, policy briefs, multimedia content, and informational brochures, all designed to capture the key insights gained from ICZM efforts. These products will highlight successful strategies, challenges faced, and lessons learned. Specifically, the lessons will include: (i) effective methods for integrating local knowledge with scientific data in coastal adaptation initiatives, (ii) strategies for overcoming challenges in multi-stakeholder collaboration, (iii) approaches to enhancing community engagement and ensuring that local populations play an active role in decision-making, (iv) the identification of cost-effective, scalable coastal resilience measures tailored to small island contexts, and (v) overcoming common barriers in monitoring and evaluating coastal adaptation actions, such as data gaps and lack of capacity. The goal is to compile this information into practical guides to support stakeholders involved in implementing similar coastal resilience projects. The guide will facilitate knowledge transfer, promote the replication of successful initiatives, and provide ongoing evaluation to identify 'best practices' through continuous feedback. Dissemination of these knowledge products will leverage both traditional written formats and modern information and communication technologies (ICTs) such as the CCCCC data clearing house and the GovSKN website to ensure broad accessibility to relevant stakeholders across the region. By sharing these insights, St. Kitts and Nevis will contribute to regional capacity-building efforts, foster the exchange of innovative approaches to coastal adaptation, and enhance collaboration among SIDS facing similar climate challenges.

Activity 4.1.3: Develop and Implement a Communication Strategy to Raise Awareness of Climate-Related Risks for Vulnerable Coastal Populations.

A comprehensive communication strategy will be developed to raise awareness of climate-related risks for vulnerable coastal populations, based on the vulnerability assessments conducted in Activity 2.1.2 and using the knowledge products produced in Activity 4.1.2. The strategy will aim to inform coastal communities about their specific risks from climate change, including sea-level rise, coastal erosion, and extreme weather events. By utilizing a variety of communication tools, such as community workshops, social media campaigns, fact sheets, and policy briefs, the strategy will engage these populations with tailored, accessible messaging. The communication efforts will empower communities to understand their vulnerabilities and encourage the adoption of adaptive measures to build resilience, including strengthening infrastructure, protecting natural ecosystems, and implementing sustainable practices. Key local stakeholders, including government representatives, NGOs, and community leaders, will be engaged to help disseminate information and ensure that messages resonate with target audiences. The MEL mechanism developed in Activity 4.1.1 will be integrated into the strategy to assess its impact and refine the approach as needed. This effort will provide coastal communities with the necessary knowledge to actively participate in climate adaptation actions and improve their resilience to climate risks.

B. Describe how the project 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 will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

Economic Benefits

The CARI-SKN project offers substantial economic benefits to both the government and local communities by significantly reducing the financial burden associated with extreme weather events. With an estimated annual savings of \$1.9 million in avoided damages, the project enables the government to redirect funds previously allocated for disaster recovery and infrastructure repair toward other critical development priorities. Considering that the current capital project budget for the entire Ministry of Public Infrastructure, Energy, Utilities, and Domestic Transport is \$22 million USD, these savings represent a significant opportunity to alleviate fiscal pressures and reallocate resources toward transformative national development. This reduction in storm-related expenses enhances fiscal stability, allowing for more strategic investments in national growth and resilience-building initiatives.

The project's inclusion of vulnerability assessments and real-time monitoring equipment represents another significant economic benefit, as these tools will provide critical data to inform evidence-based coastal adaptation measures. Historically, financial constraints have forced the government to implement interventions without the benefit of comprehensive studies, leading to unsuccessful outcomes and maladaptive practices. For example, along the Irish Town shoreline, a three-foot wall was constructed to secure the roadway. However, due to the absence of a thorough vulnerability assessment to guide the intervention, the wall soon collapsed, exacerbating the issue and significantly increasing clean-up costs. The primary lesson learned from this collapse is the critical importance of integrating comprehensive multi-hazard vulnerability assessments into the engineering design to ensure sustainable and effective outcomes. Therefore, the assessments and monitoring devices included in the CARI-SKN project will eliminate such costly trial-and-error approaches, enabling the design of robust, sustainable solutions. By reducing the financial risk of investments and ensuring that resources are allocated effectively, the project will maximize the return on adaptation expenditures while minimizing future recovery costs. This approach not only enhances fiscal responsibility but also strengthens community trust in the government's capacity to address pressing climate challenges effectively.

The project delivers economic benefits to local communities that go beyond just reducing government expenses. Prioritizing local contractors and locally sourced materials for all associated work will ensure that the project directly supports the local economy by creating jobs and opportunities for local

businesses. By reducing damage to private properties, the initiative also alleviates the financial burden on families and small businesses, who often bear the costs of repairs and losses following storms. Protecting critical public infrastructure, such as roads, ports, and transportation hubs, safeguards the continuous delivery of essential goods and services, which are indispensable to local commerce and economic stability. Together, these measures enhance economic resilience and foster an environment where communities and businesses can thrive despite the mounting challenges of climate change.

Social Benefits

The CARI-SKN project is set to deliver significant social benefits by building stronger community resilience and fostering deeper engagement in coastal adaptation efforts. Through targeted interventions such as shoreline restoration, enhanced protective infrastructure, and real-time monitoring systems, the project will directly reduce the risks faced by vulnerable communities, particularly those most exposed to the impacts of extreme weather events. By involving local stakeholders in the planning and implementation phases, the project promotes a sense of ownership and empowerment among community members which will ensure that the interventions are both inclusive and aligned with local needs. Furthermore, the project will facilitate capacity-building initiatives, equipping residents with the knowledge and tools to actively participate in and sustain long-term adaptation measures. These efforts not only protect lives, livelihoods, and critical infrastructure but also strengthen social cohesion by fostering collaborative efforts toward resilience and sustainability.

With a focus on building sustainable protections against climate-related risks, the project will directly benefit 30,792 individuals, including 14,890 males and 15,902 females, with a gender distribution reflective of the country's demographics²³. In addition, the project will impact 51,320 indirect beneficiaries, comprising 25,084 males and 26,320 females who depend on the country's coastal infrastructure and services. The age breakdown of the indirect beneficiaries (Table 4) further demonstrates that the project will benefit all age groups, with the largest proportion falling within the working-age population (15-64), emphasizing the wide-reaching socio-economic importance of this intervention. Moreover, by building resilience at the community level the project provides a platform for future generations to inherit a safer, more adaptive communities capable of withstanding climate-related challenges.

Table 4: CARI-SKN Beneficiaries by Broad Age Groups

Age	Direct Beneficiaries	Indirect Beneficiaries
Under 15	5,843	9,740
15 - 64	21,908	36,518
65 plus	3,041	5,062
Total	30,792	51,320

A key aspect of the project is the inclusion of local residents in vulnerability mapping (Outcome 2), which will not only enhance the accuracy of risk assessments but also build a greater sense of awareness and ownership among community members. By incorporating a broad spectrum of community members in the vulnerability mapping and needs assessment processes, the project ensures that the unique needs of marginalized groups, including women, elderly individuals, persons with disabilities, and low-income households, are identified and addressed. This inclusive approach will help target interventions where they are most needed and ensure that no group is left behind.

Shoreline restoration in Irish Town (Outcome 3) will deliver significant social value to the local community of approximately 1,128 residents, including 531 males and 597 females. The area encompasses 447 households, with approximately 50% headed by either sex. Irish Town, located along a low-lying, vulnerable stretch of coastline in the country's capital city of Basseterre, faces extreme exposure to climate risks, including storm surges, coastal erosion, and flooding caused by hurricanes

²³ The Population and Housing Census Summary Report St. Kitts and Nevis, 2024

and tropical storms. The Irish Town McKnight area, as cited in the 2007-2008 Country Poverty Assessment (CPA), had 23.7% of its residents identified as 'poor,' with a significant proportion of the overall poor population residing there. This socio-economic vulnerability is compounded by visible signs of underdevelopment, such as dilapidated houses, galvanize fencing, above-ground drains, and abandoned properties. However, the area also houses essential services and infrastructure, including the West Basseterre Health Center, government low-income housing, the University of the West Indies distance campus, the Technical Division of the Clarence Fitzroy Bryant College, and a community center (Figure 15). These critical facilities serve not only Irish Town but also the broader Basseterre area, making their protection vital to regional resilience. Community consultations have highlighted the disproportionate physical and economic impacts of extreme weather events on marginalized groups, particularly low-income households and women-headed families. These groups often lack the financial resources and social safety nets necessary for rapid recovery. The constant threat of storm surges and wave overtopping places an ongoing strain on these vulnerable households, who are forced to repeatedly repair their homes and properties. The emotional toll is equally significant, as residents face the trauma of frequent disruptions to their daily lives.



Figure 15: Vulnerable households in Irish Town and their proximity to the coastline. Photo taken during community walk-through in November 2024.

Community consultations have highlighted the disproportionate physical and economic impacts of extreme weather events on marginalized groups, particularly low-income households and women-headed families. These groups often lack the financial resources and social safety nets necessary for rapid recovery. The constant threat of storm surges and wave overtopping places an ongoing strain on these vulnerable households, who are forced to repeatedly repair their homes and properties. The emotional toll is equally significant, as residents face the trauma of frequent disruptions to their daily lives. Past events, such as damage caused by Hurricane Beryl in June 2024 despite being over 600 kilometres away, illustrate the precariousness of the community's situation, with even distant storms causing significant disruptions. Despite the storm's distance, the damage it caused to homes and infrastructure in Irish Town serves as a stark reminder of the exposure the community faces. Therefore, by stabilizing the shoreline through this project, the community will experience a transformative reduction in their exposure to these risks. This intervention will protect lives, properties, and critical infrastructure, enabling residents to restore normalcy more quickly after extreme weather events. It will also foster a greater sense of security and well-being, while reducing the recurring financial burden on already strained households. Moreover, by reducing exposure to climate risks, the project will enhance the area's attractiveness for investment. Stabilizing the shoreline and protecting infrastructure will make Irish Town a safer and more viable location for both public and private sector investments. This, in turn, can spur local economic development, create jobs, and foster sustainable growth. The increased stability will also encourage businesses to expand, thereby promoting long-term prosperity for the community. For a community that is among the most exposed and vulnerable to climate change impacts, this project offers a pathway to enhanced resilience, sustainability, and economic opportunity.

It ensures that future generations can benefit from a safer, more stable environment, free from the recurring burdens of climate-related disasters.

The project also includes a robust knowledge management component (Outcome 4), highlighted by a communication strategy designed to raise awareness of climate-related risks among vulnerable coastal populations. This strategy will address gaps identified during community consultations, where some individuals expressed limited awareness of their current vulnerabilities, noting that “times have changed.” Based on the vulnerability assessments conducted in Outcome 2, the project will use targeted campaigns and educational initiatives to ensure that all segments of the population, including marginalized groups, are better informed about the evolving risks posed by climate change. This heightened awareness will equip communities with the knowledge needed to adapt to these changes, strengthening their collective ability to respond to and recover from future climatic events. Furthermore, the Monitoring, Evaluation, and Learning (MEL) Framework, also under Component 4, will be established to track the distribution of benefits and ensure that the project interventions are reaching the intended beneficiaries. This will allow for adjustments to be made during implementation to address any disparities that may arise which will ensure that the benefits are equitably shared across all vulnerable groups. By integrating community involvement with educational outreach and continuous monitoring, the CARI-SKN project lays a foundation for more inclusive, resilient, and socially cohesive coastal adaptation measures.

The social benefits of the CARI-SKN project, including its impacts on community resilience and engagement, will be further detailed in the full funding proposal. This analysis will offer additional insights into how the project promotes inclusivity and long-term social sustainability.

Gender Benefits

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

A more detailed assessment of these gender benefits will be conducted during the preparation of the full funding proposal. This comprehensive analysis will ensure that the project not only mitigates climate risks but also promotes gender equity through inclusive adaptation strategies that empower women and marginalized groups while strengthening community resilience.

Environmental Benefits

Outcome 1 focuses on establishing and operationalizing the Coastal Zone Management (CZM) Committee, a cornerstone for sustainable coastal resource management and enhanced environmental protection in St. Kitts and Nevis. Currently, coastal zone management is fragmented across various ministries and departments, with limited involvement from community members, which often leads to disjointed and less effective interventions. The establishment of the Coastal Zone Management (CZM) Committee will address this gap by creating a dedicated, multi-stakeholder platform that brings together government, private sector, civil society, and local communities to ensure more coordinated and inclusive coastal management practices. Guided by the Integrated Coastal Zone Management (ICZM) strategy and plan which will be developed under this project, this committee will serve as a platform for coordinated decision-making and action among key stakeholders, including government agencies, private sector representatives, civil society, and local communities. The CZM Committee will play a pivotal role in developing and implementing the ICZM strategy, which will provide a framework for addressing complex coastal challenges such as erosion, habitat degradation, and the impacts of climate change. By encouraging collaboration across sectors and integrating scientific data with traditional knowledge, the committee will ensure that coastal management practices are not only sustainable but also inclusive of diverse perspectives. Therefore, the operationalization of the CZM Committee will enhance the government's capacity to monitor and manage coastal zones effectively and ensure that interventions are evidence-based and adaptive to changing environmental and socio-economic conditions. It will also create a mechanism for addressing competing demands on coastal resources, thereby reducing conflicts and promoting equitable access to these vital resources. A key function of

the committee will be to oversee the implementation of policies and programs that mitigate risks to coastal ecosystems while promoting their restoration and conservation. For example, the committee will coordinate efforts to reduce shoreline erosion, protect critical habitats such as mangroves and coral reefs, and enhance the resilience of coastal communities to extreme weather events. The establishment of the CZM Committee also supports long-term environmental stewardship by creating opportunities for public education and community engagement. Through outreach and capacity-building initiatives, the committee will also empower local communities to take an active role in protecting their coastal resources. In aligning its objectives with national development goals and international frameworks such as the Sustainable Development Goals (SDGs), the CZM Committee will be instrumental in ensuring that coastal management strategies contribute to broader sustainability and resilience objectives. By prioritizing integrated and participatory approaches, Outcome 1 lays the foundation for the effective and sustainable management of the country's coastal resources, benefiting current and future generations.

The construction of a retaining wall along the Irishtown Bay Road will deliver significant environmental benefits (Outcome 3), particularly for vulnerable communities reliant on surrounding ecosystems for their livelihoods and well-being. By mitigating shoreline erosion and stabilizing the coast, the wall will reduce sediment displacement which will help to preserve the ecological balance of the coastal environment. This stabilization will also diminish the need for frequent road repairs, curtailing the use of heavy machinery and reducing emissions of particulate matter (PM_{2.5}), nitrogen oxides (NO_x), and greenhouse gases. The resulting improvement in air quality will be especially beneficial for nearby residents, including marginalized groups who are disproportionately affected by respiratory and cardiovascular issues linked to dust and pollutants from road repairs. Additionally, the reduction in repair related construction activity will lower noise pollution which will result in a healthier and quieter environment for both human populations and wildlife dependent on undisturbed habitats. By prioritizing locally sourced materials, the project will further reduce the carbon footprint associated with material transportation, conserve the island's finite natural resources, and promote sustainable practices. The retaining wall will also play a vital role in protecting marine environments from debris and pollutants during extreme weather events which is a critical issue raised by local fishers and conservation groups.

At the national level, the deployment of enhanced monitoring systems and real-time water quality sensors (Outcome 2) significantly bolsters efforts to protect and conserve coastal ecosystems. By providing continuous data on pollutants, turbidity, pH levels, and nutrient content in coastal waters, these systems enable targeted interventions to improve marine and coastal ecosystem health. Healthier ecosystems, in turn, support critical sectors such as fisheries, biodiversity conservation, and tourism, which are vital to the national economy and the well-being of local communities. Vulnerable groups, including small-scale fishers and low-income households, are among the primary beneficiaries. These groups often rely on coastal and marine resources for food security, income, and protection from extreme weather events. Improved coastal water quality can lead to social benefits by enhancing opportunities for recreational activities such as swimming and fishing, thereby contributing to community well-being and local livelihoods. The detailed data from these systems also supports vulnerability assessments that can guide the development of additional interventions, such as those planned under Outcome 3. These future interventions are expected to deliver similar environmental benefits, including reduced pollution, enhanced ecosystem resilience, and the conservation of natural resources. As vulnerability assessments identify critical areas of need, targeted measures can be implemented to further reduce environmental degradation, strengthen ecosystem services, and enhance the adaptive capacity of communities. By ensuring that interventions are data-driven and evidence-based, the project creates a framework for sustainable, scalable environmental improvements that align with long-term resilience objectives.

The preliminary environmental benefits associated with the project will be comprehensively modelled and further detailed in the full funding proposal. This expanded analysis will provide a robust evidence base, highlighting the project's potential to enhance ecosystem resilience, reduce environmental degradation, and support sustainable development goals.

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

The coastal adaptation project represents a highly cost-effective investment in the long-term resilience of Saint Kitts and Nevis, with an estimated total cost of \$8.47 million. This initiative is strategically designed to mitigate the economic impacts of extreme weather events, which have historically inflicted severe damage on coastal infrastructure, ecosystems, and local economies. Between 1995 and 2017, major storms caused total losses of \$717.2 million USD, equating to an average annual loss of \$32.6 million USD. Notable events include Hurricane Georges (1998), which caused \$445 million USD in damage, and Hurricane Irma (2017), resulting in \$19.7 million USD in losses.

The economic analysis of the project highlights its cost-effectiveness and long-term benefits in reducing infrastructure damage along the coastline. As calculated in CEAC's 2019 assessment, infrastructure damage costs to coastal assets in the project area, calculated using a probabilistic approach, indicate an Average Annualized Loss (AAL) of USD \$1,940,118.15²⁴, representing the amount the Government of St. Kitts and Nevis (GOSKN) would need to allocate annually to offset future storm surge-induced damages. By implementing the proposed interventions under this project, these recurring losses can be significantly mitigated, with the project showing a strong Net Present Value (NPV) of USD \$6.4 million to \$30.4 million and a Benefit-Cost Ratio (BCR) of 1.38 to 6.70²⁵. The project also demonstrates an Internal Rate of Return (IRR) ranging from 11.2% to 26%, reflecting its economic viability²⁶.

Through a comprehensive assessment conducted by CEAC, multiple approaches to address the coastal risks in Outcome 3 were evaluated. The analysis examined various options, including natural and nature-based solutions, before concluding that the proposed coastal revetment was the only economically viable option capable of effectively addressing the recurrent storm surge and erosion challenges in the project area (Table 3). The proposed revetment, with an estimated annual recurrent maintenance cost of USD \$13,142.38, represents a modest investment when compared to the substantial benefits and cost savings from avoided damages. The intervention not only ensures the protection of vulnerable coastal assets in Basseterre but also delivers critical economic benefits by reducing the financial burden on the government and enhancing the resilience of communities to extreme weather events. Given the increasing intensity and frequency of such events due to climate change, the actual cost savings and societal benefits may surpass initial projections, further reinforcing the importance of this investment.

Beyond its financial benefits, this adaptation project offers significant long-term value by enhancing the country's resilience against climate change. The project's focus on coastal protection, real-time monitoring systems, and capacity-building measures ensures that critical infrastructure and coastal ecosystems are better protected from storm surges, flooding, and erosion. These efforts will not only safeguard livelihoods but also strengthen the country's ability to respond to and recover from future climate-related disasters. The long-term savings in recovery costs, coupled with the enhanced adaptive capacity of coastal communities, will far outweigh the initial investment. As a result, this project represents a crucial step toward a more sustainable, resilient, and economically secure future for the country, addressing both the immediate and long-term challenges posed by climate change.

D. Describe how the project 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

²⁴ Feasibility Report (Revised Report) - CEAC Solutions Limited, 2019

²⁵ Ibid

²⁶ Ibid

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 due to a number of barriers. 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.

In addition to alignment with government policies, the CARI-SKN project is also aligned with current government budgeting, which underscores coastal adaptation as a national priority. This priority is reflected in the strategic focus of three key ministries: i) the Ministry of Public Infrastructure, Energy, Utilities, and Domestic Transport, ii) the Ministry of Agriculture, Fisheries, and Marine Resources, and iii) the Ministry of Tourism, Civil Aviation, and International Transport. These ministries have allocated funding for capital projects aimed at mitigating the impacts of climate change on coastal environments, highlighting a unified recognition of the urgent need to safeguard these critical areas. However, despite these proactive measures, fiscal constraints inherent to the small budget of St. Kitts and Nevis have limited the scale and scope of interventions. Therefore, while capital projects and recurrent budgets address minor issues, they are insufficient to implement large-scale, transformative initiatives required to address the escalating impacts of climate change effectively. The CARI-SKN project directly responds to this gap by providing the additional financing needed to scale up interventions and implement comprehensive solutions.

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 also aims to leverage lessons learned from recently completed projects to maximize its impact and effectiveness in addressing climate resilience challenges in Saint Kitts and Nevis.

Specifically, the CARI-SKN project will complement and build upon the ongoing efforts within the government's current pipeline of projects. One such project is the Rehabilitation of Old Road Bay Road, which is expected to be completed in 2025. As highlighted in previous sections, the CARI-SKN project will learn from the successful implementation of coastal revetments along the Old Road coastline. The Old Road Bay Rehabilitation project cost approximately 9 million USD and was funded largely by the Republic of China Taiwan and the Caribbean Development Bank, along with government revenue. To date, Old Road Bay is one of the most comprehensive capital projects to have been undertaken in St. Kitts and Nevis in recent history. The construction work was carried out by local company Rock & Dirt Construction Ltd and supervised by the Department of Public Works. The Old Road Bay Road has been extended on reclaimed land and is approximately 24 feet apart from the old road. It has also been elevated some 15 feet above the current road level with guard rails on both sides. The seaside protection includes strong rock armouring similar to the method proposed for the Irishtown Bay Road. Key lessons from the Old Road Bay Rehabilitation include the importance of integrating local contractors and expertise into project execution to foster ownership and build capacity within the country. These insights will be instrumental in guiding the successful implementation and sustainability of the Irishtown Bay Road intervention.

In addition to the coastal protection efforts around Old Road Bay, the Ministry of Public Infrastructure has allocated funds for the Construction of Coastal Area Revetments, which aligns with Outcome 3 of the CARI-SKN project. The Government of St. Kitts and Nevis has budgeted 8 million XCD (2.9 million

USD) in 2025 for the coastal area revetment projects at Fortlands and New Guinea, intending to implement an incremental adaptation approach due to financial constraints. While this phased approach allows for the gradual improvement of coastal protection, it introduces significant risks that could affect the long-term success and resilience of the interventions. In contrast, recognizing the critical importance of the Irishtown Bay Road to both infrastructure and the local community, the government is seeking support from the Adaptation Fund to implement a comprehensive, concrete adaptation solution for this site. This approach will ensure a more immediate and robust response to the ongoing challenges of coastal erosion and storm surges, providing long-term protection for the community. The two projects will complement each other, with the incremental interventions at Fortlands and New Guinea addressing longer-term needs, while the more urgent, large-scale adaptation at Irishtown Bay Road addresses the immediate vulnerability of this critical infrastructure.

Furthermore, the Ministry of Tourism et al is advancing a project focused on Coastal Erosion Mitigation at South Frigate and Friars Bay, which focus specifically on beach restoration at two critical beaches. The CARI-SKN project will complement these initiatives by incorporating broader coastal zone management measures, providing a more integrated approach to coastal protection, and enhancing the long-term resilience of these areas. Through strategic alignment with these government initiatives, the CARI-SKN project will help to close existing financing gaps and enhance the scale and effectiveness of climate adaptation efforts in Saint Kitts and Nevis.

The CARI-SKN project will also build on the insights and achievements of recently completed coastal zone management initiatives in St. Kitts and Nevis (SKN), integrating best practices into its design and implementation. These projects have delivered valuable outcomes that align with specific components of the CARI-SKN project, enhancing its effectiveness and impact.

- The **iLand Resilience Programme**, funded by the European Union and implemented by the Caribbean Natural Resources Institute (CANARI), focused on educating the public about climate change and promoting sustainable land management practices. In addition to raising awareness, the program provided technical assistance to develop institutional frameworks for improved environmental management. The lessons learned from this project will directly contribute to the development of the Integrated Coastal Zone Management Strategy and Action Plan (Outcome 1) by offering valuable insights into institutional strengthening, governance frameworks, and community engagement strategies.
- The **Eastern Caribbean Marine Managed Areas Network (ECMMAN) Project** focused on establishing and strengthening Marine Managed Areas (MMAs), enhancing the capacity of fishers and coastal communities, and improving marine conservation decision-making tools. The CARI-SKN project will adopt best practices from ECMMAN to support the design of community-based coastal interventions and marine conservation efforts under Outcomes 2 and 3, specifically focusing on community engagement and the promotion of sustainable livelihoods.
- The **Climate and Ocean Risk Vulnerability Index (CORVI) Project**, which recently expanded to Basseterre, addressed data gaps on climate-related risks. The data and insights generated by CORVI will inform vulnerability mapping and risk assessment activities under Outcome 2.

By leveraging the best practices and lessons learned from these completed projects, the CARI-SKN project will enhance its capacity to deliver transformative outcomes and address the unique challenges faced by SKN's coastal zones while building a foundation for sustainable and inclusive resilience.

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

Outcome 4 of the CARI-SKN project focuses on enhancing learning and knowledge management systems for coastal adaptation and protection. Given the challenges posed by the dynamic nature of coastal environments, it is essential to develop systems that track, analyse, and share knowledge about effective coastal zone management practices. Therefore, this component aims to enhance the collection, analysis, and dissemination of lessons learned from past and ongoing Integrated Coastal Zone Management initiatives. By establishing a structured approach for monitoring, evaluating, and sharing information, the project aims to close knowledge gaps which will ensure that successful strategies are replicated, and common pitfalls are avoided in future coastal resilience efforts. It is important to note that all activities under the CARI-SKN project have been articulated based on

community needs, and where possible, the community will play a significant role in project implementation. However, due to the technical nature of the project's main intervention, implementation will be largely led by the Government of St. Kitts and Nevis. In spite of this, communities will remain central to the project, actively engaging in key aspects of design, monitoring, and knowledge-building. Specifically, under Outcome 3, community members will be actively involved in designing and approving the coastal area revetment to ensure that interventions align with local priorities and environmental considerations. Additionally, under Outcome 2, communities will play a crucial role in assessing and monitoring their environmental conditions, helping to build local knowledge and resilience to climate risks.

A critical activity under this outcome is the development of a comprehensive Monitoring, Evaluation, and Learning (MEL) framework, which will systematically track the progress and outcomes of CZM activities. The MEL framework will incorporate performance indicators and data collection methods to provide continuous feedback on the effectiveness of coastal adaptation interventions. By assessing the impacts of ICZM strategies, this framework will facilitate adaptive management which will enable the project to adjust its approach based on emerging challenges and lessons learned. This iterative process of evaluation will ensure that strategies are refined, decision-making is improved, and interventions remain aligned with the evolving needs of coastal communities, ecosystems, and infrastructure.

In addition to the MEL framework, Outcome 4 will focus on documenting and disseminating best practices, innovations, and lessons learned from coastal adaptation efforts. The knowledge generated will be compiled into accessible formats such as reports, fact sheets, policy briefs, and multimedia content, which will be widely shared with regional stakeholders, including government agencies, NGOs, and community leaders. To ensure broad accessibility, these knowledge products will be distributed through platforms such as the CCCCC data clearinghouse and the GovSKN website. Furthermore, the project will develop a communication strategy to raise awareness about climate-related risks for vulnerable coastal populations. This strategy will empower these communities with the information needed to make informed decisions and adopt adaptive measures. Through this approach the CARISKN project will promote a collaborative regional network committed to improving coastal resilience and sharing knowledge across Small Island Developing States (SIDS).

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 (Table 5) between August 2023 and December 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
- St. Christopher Air and Seaport Authority (SCASPA)

Recognizing the importance of inclusivity, the concept note development process also incorporated separate consultations specifically focused on gender considerations and marginalized or vulnerable groups. These discussions ensured that the needs and perspectives of these groups were directly addressed within the project. A key reference for these consultations was the *2019 Community Vulnerability Assessment (CVA)*, which provided valuable insights into hazards, coping mechanisms, and vulnerabilities. More recent consultations built upon these findings, identifying gender-differentiated needs and responses. Separate discussions were held with male and female participants to ensure gender-responsive project design, alongside targeted engagements with vulnerable groups, including low-income families, small business owners, and residents in at-risk coastal areas.

Following Working Group Meeting 10 and the Gender-Focused Discussion with institutional partners, the Government of St. Kitts and Nevis recommended that direct engagement with community members be avoided at this stage due to concerns about stakeholder fatigue. Initial consultations with communities began in 2019 (see *attached Final CRVA Report and Final Technical Specifications Report*), but to date, no tangible outcomes have materialized from these discussions. To manage the reputation of both the Government of St. Kitts and Nevis and the Caribbean Community Climate Change Centre (CCCCC), an adaptive approach to engagement was taken. Rather than formal consultations, an **informal community walk-through** was conducted in the Irishtown Bay Road area, where small business owners and individuals traversing the area were engaged in a more organic manner. This approach provided valuable feedback while respecting stakeholders' time and avoiding overburdening them.

These insights have been directly integrated into the project's components, ensuring that interventions not only improve resilience but also foster equitable economic opportunities for all members of society. Additionally, by employing a flexible, context-sensitive approach to stakeholder engagement, the project maintains its commitment to participatory decision-making while remaining responsive to evolving community dynamics.

A summary of all consultations, including those focused on gender and marginalized/vulnerable groups, is provided in the table below:

Table 5: Summary of Stakeholder Consultations

Date	Discussion Topic
23/08/2023	Working Group Meeting 1: Introduced the concept note idea and outlined the scope of the working group. Initial discussions focused on identifying barriers and needs for addressing coastal protection and advancing the blue economy in St. Kitts and Nevis.
30/08/2023	Working Group Meeting 2: Continued the exploration of barriers and needs, providing further insights into the challenges and opportunities for integrated coastal zone management and blue economy development.
13/09/2023	Working Group Meeting 3: Presented a draft structure of the concept note components for discussion. Participants provided input on further needs and challenges to refine the project framework.
27/09/2023	Working Group Meeting 4: Focused on elaborating activities to be included under the concept note. Stakeholders engaged in detailed discussions to clarify the scope and refine proposed interventions.
25/10/2023	Working Group Meeting 5: Addressed the budget and demonstration projects under Component 3. Priority projects were discussed with the PSIP and the Department of Marine Resources. Additional exchanges were held with the PSIP, Department of Public Works, and Department of Marine Resources on ongoing coastal initiatives.
28/10/2023	Working Group Meeting 6: Reviewed and discussed comments from group members on the draft concept note. Final clarifications were made regarding Component 3 activities and risk categorization.

18/11/2023	Working Group Meeting 7: The seventh working group meeting was convened to validate the CARI-SKN project concept note and secure consensus from all stakeholders. This meeting marked the culmination of the initial consultation and review process that shaped the concept note.
23/05/2024	First Submission to the Adaptation Fund
21/06/2024	Working Group Meeting 8: The eighth working group meeting focused on addressing feedback received from the Adaptation Fund's initial technical review of the CARI-SKN project concept note. The objective was to analyse the comments, identify areas requiring revision, and agree on an action plan for incorporating the necessary changes.
17/07/2024	Working Group Meeting 9: The ninth working group meeting was dedicated to validating the revised version of the CARI-SKN project concept note before its resubmission to the Adaptation Fund. The primary goal of this meeting was to ensure that all revisions had been addressed appropriately, the updated document aligned with all stakeholder inputs, and it met the technical and strategic requirements outlined by the Adaptation Fund.
22/07/2024	Second Submission to the Adaptation Fund
14/08/2024	Working Group Meeting 10: The tenth working group meeting was convened to address the comments received from the Adaptation Fund's second technical review on the CARI-SKN project concept note, with a specific focus on the Coastal Resilience Fund (formerly Outcome 4) and the selection of a priority area for Outcome 3. The goal of this meeting was to refine key project components in light of AF feedback and ensure that the revised concept met all necessary criteria for resubmission.
07/09/2024	Gender Focused Discussion: The working group convened a focused discussion with the Permanent Secretary (PS) within the Ministry of Social Development and Gender Affairs to ensure that the CARI-SKN project adequately addresses gender equality and the inclusion of marginalized groups in its design and implementation. The session aimed to align the project's objectives with national policies on gender, inclusion, and social development, ensuring that vulnerable populations are considered in the project's adaptation strategies. Specific actions were identified to ensure the active participation of women, youth, and marginalized groups in coastal adaptation measures.
29/11/2024	<p>Community Consultation: The Irishtown community walkthrough and informal discussions with residents served as a pivotal engagement activity for the CARI-SKN project. This approach allowed project staff to gather firsthand insights from community members about their experiences with climate vulnerabilities, the impacts on their livelihoods, and their perspectives on potential adaptation interventions to enhance their resilience, all without the formality of convening a structured session.</p> <p>During the walkthrough, staff members from the Caribbean Community Climate Change Centre (CCCCC) visited several small businesses and key community establishments along the Irishtown Bay Road. These included Jac's Grill, Jewelle's Beauty Salon, La Muchachona, Royal Food House, Daily Food Chinese Supermarket, and the Basseterre Market. The team engaged directly with business owners and residents, many of whom shared personal stories about the longstanding challenges posed by recurring damage to the road and adjacent coastal areas.</p> <p>A recurring sentiment expressed during these conversations was the deep frustration over the persistent road damage, which has plagued the community for years without any meaningful action to resolve it. Residents highlighted that the issue has not only caused significant disruptions to daily life and business operations but has also worsened over time due to extreme weather events and coastal erosion. Many expressed that the lack of intervention has exacerbated the financial and emotional strain on the community, leaving them feeling neglected. Most individuals agreed that a robust and comprehensive solution is long overdue. These insights strongly reinforced the urgency of implementing the proposed shoreline restoration and coastal revetment under Outcome 3, as a necessary step to address the long-standing challenges faced by the Irishtown community.</p>
02/12/2024	Working Group Meeting 11: The finalization and validation of the revised concept note for the CARI-SKN project was completed in this meeting, with a focus on confirming Irishtown Bay Road as the priority location for Outcome 3. The working group validated the removal of the Coastal Resilience Fund and policy revisions under Outcome 1 and emphasized the integration of a knowledge management component. Stakeholders unanimously agreed on the revised concept note's alignment with government priorities and national climate strategies, and the document was approved for final submission.
06/12/2024	Third Submission to the Adaptation Fund
20/01/2025	Working Group Meeting 11: The Working Group convened to review and discuss the comments from the third technical review in detail, with a focus on addressing the

	<p>recommendations provided. All relevant documents from the CEAC consultancy were shared and analyzed to determine how best to incorporate the information into the concept note. Key topics included necessary revisions to the cost-effectiveness analysis, emphasizing the environmental and social benefits of the primary project intervention, and refining the consultative process for project development.</p> <p>Stakeholders also revisited the engagement strategy, reaffirming their collective decision not to engage directly with community groups at this stage. The meeting concluded with actionable steps to address the feedback and integrate the consultancy findings.</p>
22/01/2025	Fourth Submission to the Adaptation Fund

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 steadfast in its commitment to improving coastal zone management and reducing the country's inherent vulnerability to escalating climate impacts. The CARI-SKN project activities are directly aligned with interventions identified in key policy documents, including the Nationally Determined Contributions (NDCs) and the SKN Climate Change Adaptation Strategy. These documents highlight the urgent need for action, stating that over 50% of identified priority interventions have yet to be implemented. This shortfall is primarily due to limited resources, including insufficient public investment capital and a lack of adequate human resources.

As a Small Island Developing State (SIDS), St. Kitts and Nevis faces disproportionate vulnerabilities to climate change, compounded by financial and structural constraints. The country's limited public budget is unable to fully address the scale and urgency of necessary adaptation measures, particularly in the coastal areas that are most at risk. Furthermore, the country's debt position restricts its ability to engage in deficit spending, as maintaining sustainable debt levels remains critical. These challenges are exacerbated by the economic fallout from the COVID-19 pandemic, which eroded government surpluses and GDP while imposing significant socio-economic hardships. The pandemic caused an estimated 14% annual decline in GDP and a fiscal deficit of 4.7% of GDP in 2021, leaving the country in a precarious financial position. The looming threat of a major climatic event could further strain public finances, potentially increasing the national debt burden.

In this context, the escalating impacts of climate change, such as sea level rise, coastal erosion, and increasingly frequent and severe extreme weather events, underscore the urgent need for external financial support. These climate challenges disproportionately affect the most vulnerable communities, including low-income households, women, and those residing in at-risk coastal and agricultural areas, as well as critical infrastructure essential for the nation's resilience. Without timely interventions, the adaptive capacity of these communities and the nation's ability to protect vital assets will remain compromised. Therefore, the Adaptation Fund's support is crucial for enabling St. Kitts and Nevis to implement transformative climate adaptation measures that directly address these challenges. This funding will cover the full cost of adaptation through evidence-based, concrete interventions that are in line with the priorities identified by local stakeholders and supported by government policy and budgeting. Such support would empower the government to build resilience, particularly in vulnerable coastal zones, through innovative and large-scale adaptation initiatives. It would also help to fill critical resource gaps, reduce the economic strain on the public sector, and ensure that adaptation priorities outlined in national policies can be realized. The proposed interventions are designed to address these pressing needs while ensuring that the benefits are equitably distributed, particularly among marginalized and vulnerable populations.

b. Baseline scenario and the additionality by project component.

Outcome	Baseline Scenario	Additionality by Project Component
1. Improved Institutional Coordination	Currently, St. Kitts and Nevis lacks an integrated and coordinated framework for managing its coastal zones in the	The CARI-SKN Project will directly address these gaps by establishing a Coastal Zone Management (CZM) Committee, which will serve as the central body for integrated

<p>and Governance for Coastal Zone Management</p>	<p>face of escalating climate risks. The existing approach is fragmented, with multiple ministries and departments responsible for different aspects of coastal zone management, leading to disjointed efforts and occasional maladaptive actions. The lack of a cohesive strategy and the absence of a dedicated institutional body have hindered the country's ability to effectively address the climate challenges faced by its coastal areas. Coastal zones, which are critical to the economy, livelihoods, and natural ecosystems, are highly vulnerable to sea-level rise, increased storm frequency, and coastal erosion. However, the country's current institutional and regulatory frameworks have not kept pace with the urgency of these risks. This has left the country's coastal zones inadequately protected, with limited capacity to implement long-term adaptation measures. There is also a significant gap in technical capacity among key stakeholders responsible for managing these areas, further impeding effective decision-making and adaptation planning.</p>	<p>coastal zone management (ICZM). This new institutional framework will be empowered to coordinate efforts across sectors, streamline decision-making, and ensure that adaptation measures are well-aligned with the latest vulnerability assessments. By creating a unified platform for coordination, the project will foster collaboration among ministries, local stakeholders, and other relevant actors, ensuring that climate adaptation strategies are both effective and inclusive. The development of an Integrated Coastal Zone Management (ICZM) Strategy and Action Plan is a key deliverable that will provide a clear roadmap for sustainable coastal management, integrating environmental, economic, and social considerations. This strategy will address the immediate needs for protective infrastructure while also prioritizing long-term goals such as habitat preservation and sustainable land use planning. Additionally, the project will focus on strengthening the technical and organizational capacity of the newly established CZM Committee through training and capacity-building activities. This will ensure that the committee is equipped with the necessary skills and knowledge to manage coastal risks and drive sustainable adaptation actions. With these interventions, the project will significantly enhance the governance structure for coastal zone management, empowering stakeholders to implement more coordinated and effective adaptation measures and ultimately improving the resilience of the nation's coastal areas.</p>
<p>2. Strengthened Data Management and Monitoring for Coastal Zone Adaptation.</p>	<p>St. Kitts and Nevis faces significant gaps in its coastal data management and monitoring systems, which impedes effective climate adaptation planning and response. Data collection efforts are fragmented across various ministries and organizations, including the Department of Environment, Department of Physical Planning, and SCASPA, but these efforts are often disjointed, inconsistent, and limited in scope. Monitoring is mostly concentrated around Basseterre, with only sporadic and ad-hoc data collection in other coastal areas. There is also a lack of centralized systems for storing and analyzing the collected data, hindering its integration and accessibility for decision-makers. Additionally, existing mapping efforts are outdated or incomplete, and there is no systematic, real-time monitoring of vital parameters like sea surface temperature, coastal erosion, and marine biodiversity. As a result, the country struggles to understand its coastal</p>	<p>The project will address the data gaps by significantly enhancing the capacity for data collection, monitoring, and analysis. By establishing a National Coastal Monitoring Network, integrating advanced technologies such as tide gauges, offshore weather stations, CTD profilers, and water quality sensors, the project will ensure comprehensive, real-time data coverage across both islands. This will provide high-resolution information on coastal conditions, including sea-level fluctuations, ocean currents, water quality, and climate impacts such as coastal erosion and flooding. In addition, the project will enhance data management through the creation of a centralized database, improving access and processing capabilities for decision-makers. Furthermore, the project will support community-based data collection programs, empowering local residents, particularly women, youth, and marginalized communities, to contribute to monitoring efforts. This participatory approach not only strengthens the data pool but also builds local capacity for climate adaptation. The enhanced data management and monitoring systems will feed directly into coastal vulnerability assessments, ensuring that adaptation strategies are informed by accurate, up-to-date information. By improving data availability and</p>

	<p>vulnerabilities, which impacts its ability to prioritize adaptation measures effectively. Without a cohesive data management framework, the understanding of coastal risks remains inadequate, limiting the capacity to respond to extreme climate events such as flooding, storms, and sea-level rise. This has led to significant social, environmental, and economic losses that could have been mitigated with better data-driven insights.</p>	<p>accessibility, this outcome will support better decision-making, more effective adaptation planning, and stronger climate resilience. Additionally, with enhanced data-driven evidence, St. Kitts and Nevis will be better positioned to access climate finance, as donors increasingly prioritize projects with robust data and monitoring systems that demonstrate clear, evidence-based needs for adaptation investments.</p>
<p>3. Priority Coastal Adaptation Measures for Community Protection and Resilience Implemented.</p>	<p>The Irishtown Bay Road shoreline in Basseterre is a critical transportation route that links vital infrastructure such as the main seaport, the national agricultural market, and the only tertiary-level college in St. Kitts and Nevis. However, this 550-meter stretch of road is increasingly vulnerable to the impacts of climate change, including rising sea levels, severe storms, and intense rainfall. Over recent years, these climate events have caused substantial erosion and damage to the shoreline, disrupting transportation, access to services, and local businesses. In the aftermath of these events, the community is often left to deal with the physical and emotional burdens of road repairs, which are typically inadequate due to limited resources. This ongoing cycle of damage and repair not only strains the community but also exacerbates feelings of vulnerability. Additionally, the lack of sufficient shoreline protection measures exacerbates the risk to critical infrastructure and the local economy, further underscoring the need for immediate and comprehensive coastal adaptation actions. The absence of a detailed vulnerability assessment and coordinated, long-term protection strategy has left the Bay Road at constant risk of climate-induced disruptions.</p>	<p>The project will bring significant additional value by implementing targeted coastal adaptation measures to protect the Irishtown Bay Road shoreline. The planned interventions will reduce the vulnerability of the road to future climate impacts by installing robust, sustainable shoreline protection solutions. The first step will involve a comprehensive site assessment, building upon previous work to understand the dynamics of coastal erosion, wave patterns, and sediment movement. Based on the findings, tailored protection measures, including physical barriers, natural buffers, and engineered reinforcements, will be designed to address both coastal and inland risks such as flooding. The construction phase will implement these designs, ensuring minimal environmental disruption and enhancing resilience to storm surges, sea-level rise, and erosion. The inclusion of natural elements, such as vegetation restoration, will further promote ecological sustainability. This process will also involve community engagement to ensure the solutions align with local needs and priorities. By providing long-term protection, the project will reduce the need for costly repairs, mitigate the social and emotional toll on residents, and safeguard critical infrastructure, enhancing the overall resilience of the area. Additionally, the successful implementation of these measures will strengthen the adaptive capacity of the local community and the surrounding infrastructure, contributing to the broader goal of increasing resilience to climate impacts in St. Kitts and Nevis. This intervention will not only protect vital infrastructure but also create employment opportunities, support the local economy, and improve the well-being of the affected communities.</p>
<p>4. Knowledge Management Systems for Coastal Adaptation and Protection Improved.</p>	<p>At present, there is no formalized monitoring, evaluation, and learning (MEL) framework in place for coastal adaptation and protection efforts in St. Kitts and Nevis. Coastal zone management (CZM) efforts are largely uncoordinated and lack systematic tracking of progress, outcomes, or lessons learned. The absence of a comprehensive MEL system makes it difficult to</p>	<p>The additionality of this Outcome lies in its ability to introduce critical improvements in the knowledge management systems for coastal adaptation and protection, particularly through the development of a tailored Monitoring, Evaluation, and Learning (MEL) framework. Currently, there is no systematic, structured mechanism to monitor and evaluate the impact of coastal adaptation efforts, which limits the ability to assess progress, identify challenges, and adjust strategies accordingly. This project will fill that gap by creating a MEL</p>

	<p>assess the effectiveness of interventions and adapt strategies accordingly. Knowledge-sharing mechanisms are also fragmented, and there is no consolidated platform for capturing, disseminating, and utilizing lessons from past or ongoing coastal adaptation efforts, leading to inefficiencies and missed opportunities for replication or scaling of successful practices.</p>	<p>framework that will track the effectiveness of coastal protection measures, provide ongoing assessments, and ensure that adaptive management practices are based on evidence and lessons learned.</p> <p>Additionally, the project will enhance the capacity for knowledge sharing by developing practical, accessible knowledge products such as reports, policy briefs, and multimedia content. These products will compile best practices, lessons learned, and scientific data into a format that can be easily disseminated through regional networks and digital platforms. This structured knowledge dissemination will ensure that stakeholders across the region can access and apply valuable insights, something that is currently lacking in many coastal adaptation efforts. The project will also implement a communication strategy to raise awareness among vulnerable coastal communities about the specific climate risks they face, empowering them to engage in adaptation efforts. These efforts to build local awareness and participation in resilience-building are essential, as there is currently no coordinated, targeted communication strategy to inform and involve these communities.</p>
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c. Alternative funding options

Alternative funding options for adaptation projects are very limited, primarily due to the absence of private sector finance, which is hindered by the lack of incentives, missing information, high perceived investment risks, and low or absent returns on investment. This issue is compounded by the country's classification as a 'High-Income' country based on Gross Domestic Product (GDP) per capita, a metric that does not accurately reflect the nation's true economic standing. In reality, the country's small size and vulnerability to climate change mean that its economic capacity is overstated, and the financial resources required for large-scale adaptation efforts remain difficult to secure.

d. Justification of concessionality

St. Kitts and Nevis contributes minimally to global greenhouse gas emissions, yet it bears the brunt of the adverse impacts of climate change. The country's most vulnerable communities, including those in low-income and at-risk coastal areas, disproportionately experience the effects of rising sea levels, coastal erosion, and increasingly severe extreme weather events. These climate-related impacts threaten their livelihoods, safety, and well-being, while also jeopardizing critical infrastructure. It is inherently unjust for a nation with such a negligible role in driving global climate change to face mounting adaptation costs without adequate international support. Given this disparity, St. Kitts and Nevis requires grant-based financing to address its climate vulnerabilities without exacerbating fiscal constraints or compromising the socio-economic development of its people.

The country should not have to choose between pursuing sustainable development and building climate resilience. As a Small Island Developing State (SIDS), St. Kitts and Nevis already faces structural challenges such as limited economies of scale, high dependency on tourism, and susceptibility to external shocks. Allocating scarce public resources to adaptation measures diverts funding from other critical sectors such as education, healthcare, and infrastructure development, thereby slowing progress toward national development goals. Grant-based financing from the Adaptation Fund is essential to bridge this gap, ensuring that St. Kitts and Nevis can enhance its adaptive capacity while continuing to pursue its broader development agenda. This support also aligns with the principles of climate justice, recognizing the moral imperative for the global community to assist vulnerable nations in addressing a crisis they did little to create.

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, particular attention has been given to the sustainability of its outcomes. As such, the project has been thoughtfully developed to ensure that its immediate achievements translate into lasting benefits through strategic arrangements and robust frameworks. By integrating capacity building, strategic planning, and knowledge management into its core design, the project aims to create long-term resilience that persists well beyond its lifecycle and the withdrawal of support from the Adaptation Fund.

To achieve this, the project operates on multiple fronts to bolster sustainability. Firstly, it seeks to dismantle institutional barriers and foster deeper cooperation in coastal zone management among governmental institutions, civil society, and the private sector. A key component of this effort is the establishment of a new Coastal Zone Management Committee, which will utilize established professionals already employed in relevant fields, ensuring that their participation does not require additional salary or resources beyond their regular duties. This committee will inject political support, expertise, and regulatory enforcement capabilities into coastal management. Additionally, the project focuses on enhancing the capacities of key stakeholders, strengthening coordination and expertise to ensure continued impact. In parallel, the CARI-SKN project is developing a comprehensive Integrated Coastal Zone Management Plan and Strategy which will lay the groundwork for securing additional financing for critical coastal adaptation measures.

Another major aspect of this initiative is the enhancement of monitoring infrastructure and the inclusion of local communities in vulnerability assessments, which will continuously generate valuable data to inform future resilience efforts and provide a sustainable model for local coastal management practices. The Department of Marine Resources will oversee the maintenance of the coastal monitoring equipment, supported by its existing budget allocation for such tasks. Furthermore, key stakeholders will receive training on operating and maintaining the new equipment to ensure the sustainability of monitoring systems beyond the project's conclusion.

The project also includes the design of the Coastal Area Revetment along Irishtown Bay Road which has prioritized the utilization of low-maintenance materials (locally sourced) and techniques that reduce upkeep demands. This approach minimizes the financial and operational burden on local authorities which will increase long-term functionality. Although the revetment is designed to require minimal financial resources for maintenance, the Department of Public Works has an operational budget allocation of over \$500,000 USD per year for maintaining critical infrastructure. Additionally, as the Department of Public Works will be executing the project, their engineers will be well-versed in the requirements for maintaining the infrastructure. This ensures that the department has the necessary expertise to oversee the continued operability of the revetment with minimal additional resources.

Finally, the project's knowledge management component ensures the long-term adoption of successful strategies by documenting lessons learned, best practices, and effective coastal adaptation measures. This information will be accessible to regional stakeholders, including government agencies, NGOs, and local communities, empowering them to continue scaling and adopting effective resilience strategies even after the project ends. Through this, the CARI-SKN project contributes to broader regional resilience and sustainability.

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*.

As part of the development of the full funding proposal, a comprehensive Environmental and Social Impact Assessment (ESIA) will be conducted to thoroughly evaluate both the risks associated with the project activities and potential risks that may extend beyond the desired project outcomes. This

assessment will ensure that any unintended consequences, such as displacement, unequal benefits, or unforeseen social impacts, are identified and addressed. Additionally, an Environmental and Social Management Plan (ESMP) will be developed to guide the implementation and monitoring of these mitigation strategies.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	The project has been designed to comply with relevant national laws, regulations and policies.	
<i>Access and Equity</i>		<p>Project Risk:</p> <ul style="list-style-type: none"> i.) Unequal Distribution of Benefits ii.) Limited Participation and Representation. <p>Risk Level: Low</p> <p>Impact: Unequal distribution of project benefits, such as access to enhanced infrastructure or resources, could create social tensions and erode trust among stakeholders. If marginalized groups feel excluded from activities under Outcomes 2 and 3, they may disengage, reducing their participation in vulnerability assessments or adaptation planning. This could result in solutions that fail to address diverse community needs, diminishing the effectiveness of proposed climate adaptation measures. Limited engagement risks undermining community ownership, negatively impacting the project's reputation, long-term sustainability, and its ability to foster inclusive climate adaptation.</p> <p>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 <i>Access and Equity</i>. 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.</p>
<i>Marginalized and Vulnerable Groups</i>	Consultations with local stakeholders reveal that marginalized groups are already significantly affected by climate variability. In response, this project is designed to improve their resilience. Specifically, the site for the physical intervention under Outcome 3 was selected to strengthen the capacity of marginalized groups to endure extreme weather events. Additionally, under Outcome 2, vulnerability assessments will identify other at-risk groups and develop targeted adaptation strategies. These strategies will be integrated into the broader Integrated Coastal Management Plan under Outcome 1 to ensure inclusivity and address climate vulnerabilities comprehensively.	
<i>Human Rights</i>	St. Kitts and Nevis generally upholds a positive	


	human rights track record ²⁷ , having ratified key international treaties and implemented measures to protect human rights domestically. This project is committed to respecting these standards and will not infringe on anyone's human rights. Additionally, the CCCCC, known for promoting and safeguarding human rights, provides an accessible online grievance redress mechanism for the public to log complaints or concerns related to project activities.	
<i>Gender Equality and Women's Empowerment</i>		<p>Risk:</p> <ul style="list-style-type: none"> I. Gender disparities in decision-making and project benefits. II. Impact to livelihood of women and other vulnerable groups. <p>Risk Level: Medium</p> <p>Impact: Gender disparities in decision-making and the distribution of project benefits could result in unequal resource allocation, limiting diverse perspectives in the planning and implementation phases. This could affect activities under Outcome 2, where vulnerability assessments and adaptation strategies may not fully consider gender-specific needs. Such imbalances could perpetuate existing inequalities, hinder meaningful community participation, and reduce the effectiveness of interventions like storm surge resilience measures. Ultimately, this could undermine the project's impact, sustainability, and its goal of inclusive climate adaptation.</p> <p>Next Steps: The development of the full funding proposal will ensure informed engagement with Women's representatives 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).</p>
<i>Core Labour Rights</i>	St. Kitts and Nevis has ratified 11 International Labour Organization (ILO) conventions, including 8 fundamental ones addressing issues such as freedom of association, collective bargaining rights, and the elimination of forced labour, child labour, and discrimination. These conventions support the establishment of equitable labour standards. Accordingly, this project will adhere to these conventions alongside existing national labour laws to uphold workers' rights and maintain compliance with international and local standards.	
<i>Indigenous Peoples</i>	St. Kitts and Nevis do not have any formally recognized indigenous groups within their population.	

²⁷ Saint Kitts and Nevis 2021 Human Rights Report.

<i>Involuntary Resettlement</i>	The proposed project components do not entail the displacement of individuals from their residences or land.	
<i>Protection of Natural Habitats</i>	The proposed project does not intend to impact the protection of natural habitats. The activities, particularly the shoreline stabilization measures under Outcome 3, are designed to enhance resilience without disrupting natural habitats. Careful planning and mitigation measures will ensure that the integrity of coastal ecosystems and habitats is maintained throughout the project's implementation.	
<i>Conservation of Biological Diversity</i>	The project will not negatively impact the conservation of biological diversity. On the contrary, through improved monitoring of marine ecosystems, the project aims to enhance biodiversity by identifying key areas for protection and ensuring better management practices	
<i>Climate Change</i>	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.	
<i>Pollution Prevention and Resource Efficiency</i>		<p>Risk(s):</p> <ul style="list-style-type: none"> I. Contamination of coastal waters and ecosystems due to inadequate waste management practices. II. Inefficient use of limited natural resources <p>Impacts: Under Outcome 3, there is potential for inadequate waste management, particularly by contaminating coastal waters and ecosystems which could harm marine habitats and water quality. Additionally, due to St. Kitts and Nevis' limited natural resources, inefficient use of water, energy, and materials such as rocks for shoreline stabilization is also a risk.</p> <p>Risk Level: Medium</p> <p>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.</p>
<i>Public Health</i>		<p>Risk(s):</p> <ul style="list-style-type: none"> I. Health risks from marine pollution and toxins. II. Air and Noise Pollution <p>Risk Level: Medium</p> <p>Impact: The shoreline stabilization activity under Outcome 3 may have public health implications during the construction phase, particularly in terms of air and water quality. Dust, noise, and the use of heavy machinery could affect local residents, while construction activities might temporarily disturb coastal</p>


		ecosystems. Next Steps: The proposed project is committed to safeguarding public health by carrying out all activities and interventions with careful consideration for the well-being of local communities. This focus on public health will be thoroughly assessed in the ESIA and detailed in the ESMP, outlining measures and protocols to address any potential risks or impacts on public health.
<i>Physical and Cultural Heritage</i>	The project includes no activities that will impact cultural or physical heritage.	
<i>Lands and Soil Conservation</i>	The project does not intend to negatively impact lands and soil conservation. Instead, under Component 3, shoreline protection measures will be implemented to conserve coastal land and soil.	

A. Record of endorsement on behalf of the government

<i>Mrs. Colincia Levine, Permanent Secretary, Ministry of Environment, Climate Action and Constituency Empowerment</i>	Date: 23/05/2024 
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B. Implementing Entity certification

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	



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,

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





Revised PFG Submission Form¹
Project Formulation Grant (PFG)

Submission Date: February 18, 2025

Adaptation Fund Project ID: AF00000393

Country: Saint Kitts and Nevis

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

Type of IE (NIE/RIE/MIE): Regional Implementing Entity (RIE)

Implementing Entity: Caribbean Community Climate Change Centre (CCCCC)

Executing Entity: Caribbean Community Climate Change Centre (CCCCC)

A. Project Preparation Timeframe

Start date of PFG	May 2025
Completion date of PFG	March 2026

B. Proposed Project Preparation Activities (\$)

List of Proposed Project Preparation Activities	Output of the PFG Activities	US\$ Amount	Budget note²
1. Conduct Environmental and Social Impact Assessment (ESIA) and Develop Environmental and Social Management Plan (ESMP)	A comprehensive Environmental and Social Impact Assessment (ESIA) report and an Environmental and Social Management Plan (ESMP) developed in accordance with Adaptation Fund environmental and social policy requirements.	\$60,000	The Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) will be conducted by a consultant at a daily rate of \$500 for 120 workdays over the contract period. This budget covers fees for conducting assessments, stakeholder consultations, data collection, and report preparation. It also

¹ As presented in AFB/PPRC.33/40 Annex 1.

² The proposal should include a detailed budget with budget notes indicating the break-down of costs at the activity level. It should also include a budget on the Implementing Entity management fee use.

			includes costs for travel, logistics, and engagement with affected communities and key stakeholders to ensure compliance with Adaptation Fund environmental and social policy requirements.
2. Conduct Gender Assessment and Develop Gender Action Plan	A comprehensive Gender Assessment and Gender Action Plan tailored to the project's objectives, identifying gender-specific vulnerabilities, roles, and opportunities in climate adaptation.	\$60,000	The Gender Assessment and Gender Action Plan will be conducted by a consultant at a daily rate of \$600 for 120 workdays over the contract period. This budget covers fees for conducting assessments, stakeholder consultations, data collection, and report preparation. It also includes costs for travel, logistics, and engagement with affected communities and key stakeholders to ensure compliance with the Adaptation Fund Gender Policy.
3. <i>Implementing Entity Fee (8.5%)</i>		<i>\$10,200</i>	
Total Project Formulation Grant		\$130,200	

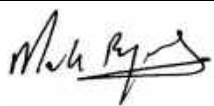
Please describe below each of the PFG activities and provide justifications for their need and for the amount of funding required:

Activity 1: The Environmental and Social Impact Assessment (ESIA) and the Environmental and Social Management Plan (ESMP) are integral to the full funding development process for the Coastal Adaptation and Resilience Initiative - Saint Kitts and Nevis. The ESIA will assess potential environmental and social risks associated with the proposed project interventions, evaluating factors such as land use, biodiversity, community health, and potential displacement. It will ensure that these interventions are designed to minimize negative impacts while promoting long-term sustainability. The ESMP will complement the ESIA by outlining mitigation measures, monitoring frameworks, and institutional responsibilities to ensure compliance with national and international environmental and social safeguards. These assessments will provide a comprehensive evaluation of the potential environmental and social impacts of the proposed interventions to ensure that they are aligned with the environmental and social safeguards policy of the Adaptation Fund. The \$60,000 allocated will support a thorough assessment process, including data collection, stakeholder consultations, and the development of actionable strategies that guarantee the project's environmental and social integrity.

Activity 2: The Gender Assessment and the development of the Gender Action Plan (GAP) are crucial to ensuring the inclusivity and equity of the proposed interventions under the Coastal Adaptation and Resilience Initiative - Saint Kitts and Nevis. The assessment will explore the gendered vulnerabilities and opportunities within the coastal communities of Saint Kitts and Nevis, focusing on disparities in access to climate-resilient resources, participation in decision-making processes, and the equitable distribution of project benefits. This will ensure that that women and men are equally represented in decision-making processes and have equitable access to the benefits of the project. The Gender Action Plan will outline specific strategies to address these disparities, including targeted recommendations, interventions, and capacity-building measures to ensure gender-responsive project implementation. This approach will foster social inclusion and alignment with the Adaptation Fund’s Gender Policy. The \$60,000 allocated for this activity will support detailed assessments, community consultations, and the formulation of a comprehensive Gender Assessment and a Gender Action Plan.

C. Implementing Entity

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

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Dr. Mark Bynoe		19/02/2025	Ryan Phillip	+5016058078	rphillip@caribbean climate.org

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 persons²⁸. 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)²⁹.

Saint Kitts and Nevis is classified by the UN As a high-income, high human development country.³⁰ 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 poverty³¹. 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”³².

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.³³ 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 posts³⁴.

Within the fisheries sector, a key income earner in coastal communities, women are often in the lowest underpaid or informal, temporary, or part-time positions³⁵. 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 involved³⁶. 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 processes³⁷. 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

²⁸ Department of Statistics, The Population and Housing Census Summary Report Saint Kitts and Nevis, 2024

²⁹ GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

³⁰ GOSKN, Saint Christopher (St. Kitts) And Nevis Voluntary National Review Of 2030 Agenda for Sustainable Development, 2022

³¹ *Ibid*

³² Basch and Associates, Country Gender Assessment, 2014

³³ GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

³⁴ *Ibid*

³⁵ *Ibid*

³⁶ *ibid*

³⁷ GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

household decision making processes that affect their lives”³⁸. 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 women. The BUR puts forward that measures should consider the vulnerability and needs of female-headed low-income households³⁹. Notwithstanding female vulnerability to climate impacts, it is worth noting that older women often fare better than older men who live alone post disasters⁴⁰. This is explained as being stemmed from men having multiple families in their youth, therefore being unable to form solid ties with these households⁴¹.

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”.⁴² 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 fishers⁴³. This is a result of outdated approaches to data collection, analysis and management⁴⁴. 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.⁴⁵ 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.⁴⁶

³⁸ Adapted from GoSKN, National Gender Equality Policy and Action Plan for Saint Kitts and Nevis, 2021

Ibid

³⁹ GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

⁴⁰ Basch and Associates, Country Gender Assessment, 2014

⁴¹ *Ibid*

⁴² GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

⁴³ GoSKN, St Kitts and Nevis Agricultural Transformation and Growth Strategy 2022-2031, 2022

⁴⁴ *ibid*

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

⁴⁶ CEAC SOLUTIONS LTD, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019

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*⁴⁷:

- 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
- 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.⁴⁸ 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 business⁴⁹. 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”⁵⁰. Floods also result in damaged roads and houses resulting in displacement, disruption of school, emotional trauma, and lack of access to businesses⁵¹.

⁴⁷ Information sourced directly from CEAC Solutions Ltd, Road Sector Hazard Risk and Vulnerability Assessment Report SKN (Revised Report), 2019

⁴⁸ *Ibid*

⁴⁹ *ibid*

⁵⁰ *ibid*

⁵¹ *idib*

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 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 plans⁵².

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 internet⁵³. 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 variability⁵⁴. 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.

⁵² GEF, <https://news.iwlearn.net/empowering-women-for-sustainable-coastal-management>, accessed 11/07/2024

⁵³ GoSKN, St. Kitts and Nevis First Biennial Update Report, 2023

⁵⁴ *ibid*

Climate Risk	Pathway	Impact	Proposed Adaptation Measure
Extreme Rainfall	Coastal Flooding	Inability to address the increased flooding risk due to fragmented governance.	Output 1.1: A dedicated Coastal Zone Management Committee is established and operational.
		Insufficient vulnerability data hinders the design of effective flood control measures.	Output 2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making.
		Lack of coordinated monitoring of rainfall and coastal conditions exacerbates flood risks.	Output 2.2: Improved coastal monitoring and data management systems to support Integrated Coastal Zone Management.
		Vulnerability to flooding due to inadequate shoreline protection, particularly during heavy rainfall.	Output 3.1: Shoreline Protection and Resilience Enhancements for the Bay Road in Basseterre, St. Kitts.
		Lack of knowledge about flood risks and effective adaptation strategies leads to poor community resilience.	Output 4.1: Enhanced learning and knowledge management systems
Intensified Tropical Cyclones	Increased Storm Intensity and Frequency	Delayed response and uncoordinated actions to mitigate storm impacts.	Output 1.1: A dedicated Coastal Zone Management Committee is established and operational.
		Lack of data leads to poor forecasting and response to extreme storm events.	Output 2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making.
		Damage to coastal infrastructure, including the Bay Road, leading to service disruptions.	Output 3.1: Shoreline Protection and Resilience Enhancements for the Bay Road in Basseterre, St. Kitts.
		Limited knowledge dissemination leads to inadequate community preparedness for extreme weather.	Output 4.1: Enhanced learning and knowledge management systems
Increased Temperatures	Rising Sea Surface Temperatures	Limited understanding of marine ecosystem impacts due to rising sea temperatures.	Output 2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making.
Sea Level Rise	Increased Coastal Flooding and Erosion	Increased coastal erosion, flooding, and loss of infrastructure without cohesive management.	Output 1.1: A dedicated Coastal Zone Management Committee is established and operational.
		Uncertainty in sea level rise projections due to inadequate data systems for risk profiling.	Output 2.1: Enhanced Coastal Risk and Vulnerability Analysis for Improved Adaptation Decision-Making.
		Shoreline erosion threatens the Bay Road, increasing the risk of infrastructure collapse.	Output 3.1: Shoreline Protection and Resilience Enhancements for the Bay Road in Basseterre, St. Kitts.
		Inadequate knowledge sharing on best practices for managing sea level rise impacts.	Output 4.1. Enhanced learning and knowledge management systems

Annex 2 – Climate Impact Chain Analysis

Annex 3 – Theory of Change

If the Coastal Adaptation and Resilience Initiative establishes effective institutional coordination, strengthens data management and monitoring, and implements targeted coastal adaptation measures, **THEN** the resilience of coastal communities to climate-related risks will be significantly improved **BECAUSE** informed decision-making, resource allocation, and proactive planning will reduce vulnerabilities, enhance protection of coastal ecosystems, and foster sustainable, community-centered adaptation solutions.

