



ECOLOGICAL CONNECTIVITY
COMMUNITY RESILIENCE

ENHANCING COMMUNITY RESILIENCE THROUGH ECOSYSTEM-BASED ADAPTATION IN GRENADA

August 2025

A legal and policy assessment
to determine opportunities for an
ecosystem-based adaptation intervention



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based on a decision of
the German Bundestag

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Executive Summary

This report presents a comprehensive legal and policy assessment of the Woburn Clarke's Court Bay Marine Protected Area (WCCBMPA) in Grenada, undertaken as part of the Ecological Connectivity and Community Resilience (ECCR) Project. The assessment aims to evaluate the enabling environment for implementing an Ecosystem-based Adaptation (EbA) intervention, with a focus on mangrove restoration as a strategy to reduce disaster risk and enhance resilience for communities reliant on marine resources. The WCCBMPA, home to Grenada's largest intact mangrove ecosystem, is an ecologically and economically significant zone. However, it is increasingly threatened by unregulated development, pollution, climate change impacts, and fragmented governance.

The assessment applies a mixed-methods approach, combining legal and policy analysis with an Applied Political Economy Analysis (APEA), and draws on international best practices and local stakeholder insights. It identifies a diverse network of stakeholders including fishers, community members, private sector entities, civil society organizations, academic institutions, and government agencies; with varying degrees of power and engagement in MPA governance. While many actors express support for conservation and EbA, challenges such as land tenure uncertainty, limited funding, weak enforcement, and data gaps hinder effective implementation.

Grenada has a foundational legal framework that supports marine conservation, but most national laws and policies fall short of systematically embedding EbA or nature-based solutions (NbS) into disaster risk reduction (DRR) and climate change adaptation (CCA) planning. Although the country has ratified key international conventions such as the Convention on Biological Diversity (CBD), UNFCCC, and Ramsar Convention, their principles are not yet fully operationalized at the national or local levels. Opportunities exist to mainstream EbA through legal reforms, updated Environmental Impact Assessment (EIA) regulations, enhanced stakeholder co-management, and the development of a national EbA policy framework.

The report outlines a clear set of legal and policy recommendations to support EbA, including clarifying coastal land tenure, revising the Fisheries Act and Marine Protected Area (MPA) regulations, institutionalizing community-based stewardship, and enabling ecosystem service valuation tools such as blue carbon credits. Additionally, it proposes a multi-tiered advocacy strategy that positions EbA as an economic and climate risk reduction measure, builds diverse coalitions, leverages legal reform windows, and mobilizes community knowledge and climate finance.

In sum, this assessment underscores the urgent need and strong potential for an integrated, inclusive, and legally supported approach to EbA in the WCCBMPA. If implemented, these recommendations could transform the area into a national model for climate-smart coastal governance that secures both ecological integrity and sustainable livelihoods for the people of Grenada.

Glossary of Terms

Applied Political Economy Analysis (APEA)

A method used to understand the influence of political, economic, and social factors on policy decisions and institutional behaviour, often used to inform governance and development strategies.

Blue Carbon

Carbon captured and stored in coastal and marine ecosystems such as mangroves, seagrasses, and salt marshes as these ecosystems play a vital role in climate change mitigation.

Co-Management

A shared governance approach where decision-making responsibilities are divided between government authorities and local stakeholders, such as community groups or fisherfolk.

Coastal Zone Management (CZM)

A process that seeks to balance environmental, economic, cultural, and recreational interests in coastal areas through sustainable planning and regulatory tools.

Disaster Risk Reduction (DRR)

Strategies and actions aimed at preventing or reducing the damage caused by natural hazards, such as floods, hurricanes, and sea-level rise.

Ecosystem-Based Adaptation (EbA)

The use of biodiversity and ecosystem services, like mangrove forests that help to communities adapt to the adverse effects of climate change.

Environmental Impact Assessment (EIA)

A process that evaluates the likely environmental impacts of a proposed development before decisions are made, ensuring that they are addressed in the planning phase.

Fisheries Act / Marine Protected Areas Regulations

Grenada's legal framework that governs marine resource use and establishes rules for protected marine zones.

Green Infrastructure

Infrastructure solutions that mimic natural processes to provide environmental benefits, such as reducing flood risk or improving water quality (e.g., vegetated buffers, bioswales).

Integrated Coastal Zone Management (ICZM)

A coordinated strategy to manage coastal areas holistically, addressing land-sea interactions, ecosystems, and stakeholder needs.

Mangrove Rehabilitation

The restoration or replanting of mangrove forests to enhance ecosystem services such as shoreline protection, carbon storage, and nursery habitat for marine species.

Marine Protected Area (MPA)

A designated marine zone managed for the long-term conservation of biodiversity and natural resources, often with restrictions on human activity.

Nature-Based Solutions (NbS)

Approaches that use nature and natural processes to address environmental, social, and economic challenges, such as using mangroves for coastal protection.

Resilience

The ability of a system, such as a community or ecosystem to withstand, recover, and adapt to shocks like natural disasters or climate change.

Sargassum

A type of brown seaweed that can accumulate along coastlines, causing environmental and economic problems when present in large quantities.

Sediment Runoff

Soil and debris washed into water bodies from land, typically during heavy rains or construction activities, which can damage marine ecosystems.

Stakeholder Engagement

The process of involving individuals, groups, or organizations with an interest or role in a project or policy, ensuring transparency and inclusive decision-making.

Tenure Insecurity

Uncertainty or disputes over land ownership or use rights, which can impede conservation, development, or restoration initiatives.

UNFCCC (United Nations Framework Convention on Climate Change)

An international treaty that addresses global climate change, guiding countries in reducing greenhouse gas emissions and adapting to its impacts.

Zoning

The division of land or marine areas into specific zones for designated uses, such as conservation, tourism, or fishing, to ensure sustainable management.

Acronyms

APEA	Applied Political Economic Analysis
BSAP	Biodiversity Strategy and Action Plan
CBD	Convention on Biological Diversity
CCA	Climate Change Adaptation
CDM	Comprehensive Disaster Management
CDRI	Coalition for Disaster Resilient Infrastructure
CCA	Climate Change Adaptation
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CITES	Convention on International Trade in Endangered Species
CSO	Civil Society Organization
DRR	Disaster Risk Reduction
EbA	Ecosystem-based Adaptation
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GEF	Global Environment Facility
GRCS	Grenada Red Cross Society
IAGDO	Inter-Agency Group of Development Organisations
IFRC	International Federation of Red Cross and Red Crescent Societies
IUCN	International Union for Conservation of Nature
MPA	Marine Protected Area
NAP	National Adaptation Plan
NbS	Nature-based Solution
NBSAP	National Biodiversity Strategy and Action Plan
OCES	Organization of Eastern States
ROP	Ramsar Convention on Wetlands ("Ramsar Site" designation)
RI	Resilient Islands by Design (Project)
SIDS	Small Island Developing States
SOP	Standard Operating Procedure
SOPs	Standard Operating Procedures
SGU	St. George's University
TNC	The Nature Conservancy

UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar

1. Introduction

1.1. Contextual and Methodological notes

Grenada's geographic and ecological landscape plays a defining role in shaping its development trajectory and climate resilience priorities as the country consists of three main islands—Grenada, Carriacou, and Petite Martinique—situated in the southeastern Caribbean Sea, within the hurricane belt.¹ The main island, Grenada, is characterized by volcanic topography, rugged hills, narrow coastal plains, and an extensive coastline dotted with bays, mangroves, coral reefs, and seagrass beds.^{2 3} These ecosystems are vital to national biodiversity and coastal protection, particularly in low-lying communities like Woburn Clarke's Court Bay. The area is part of Grenada's leeward southeast coast, where shallow inshore waters support traditional fisheries and emerging marine tourism. The island's location makes it highly susceptible to tropical storms, sea-level rise, and coastal erosion, underscoring the critical need for integrated marine and terrestrial management in national development strategies.⁴

Additionally, Grenada is a small, upper-middle-income island economy of just over 113,000 people with a per-capita GDP of approximately USD 9,000⁵—celebrated its 50th anniversary of independence in 2023. Tourism and services together account for more than 60 percent of GDP, while fisheries and agriculture—key to communities around Woburn Clarke's Court Bay—contribute about 5 percent. Despite relatively high literacy (over 98 percent) and a Human Development Index of 0.78, some 38 percent of Grenadian households live below the national poverty line⁶, with coastal villages often experiencing the highest rates of food insecurity and youth unemployment (IHS, 2019).

In the presentation of the Vision 75 in 2023- a strategy for Grenada for the next 25 years- the present Prime Minister, Dickon Mitchell, stated the following: "Grenada, for Vision 75, that says to the world, the same way we did 50 years ago, that we are prepared to go out on a limb, we are prepared to make a difference, we are prepared to create and curate a future, in our own image, in our own likeness as we continue to aspire, build, and as one people, so that 25 years from now, when we look back, we can definitely say that we went up, up, up." However, "going up" will require a resilient natural, physical and social society.

¹ Government of Grenada. (2020). Grenada Blue Growth Coastal Master Plan. Ministry of Climate Resilience. Retrieved from <https://clmeplus.org/doculibrary/grenada-blue-growth-coastal-master-plan/#:~:text=Blue%20Grenada%20Master%20plan%20is,the%20coastal%20zone%20that%20takes>

² UNEP. (2014). The Importance of Mangroves to People: A Call to Action. UNEP-WCMC. Retrieved from <https://www.unep.org/resources/report/importance-mangroves-people-call-action>

³ Spalding, M., McIvor, A., Tonneijck, F., Tol, S., & van Eijk, P. (2014). Mangroves for coastal defence. Wetlands International and The Nature Conservancy. Retrieved from <https://www.wetlands.org/publication/mangroves-for-coastal-defence/>

⁴ IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Sixth Assessment Report. Retrieved from <https://www.ipcc.ch/report/ar6/wg2>

⁵ World Bank. (2022). Grenada Data. Retrieved from <https://data.worldbank.org/country/grenada>

⁶ IHS. (2019). Grenada Country Poverty Assessment. Ministry of Social Development, Housing and Community Empowerment.

According to the INFORM Risk⁷ database Grenada has marginally improved its aggregate scores in the climate risk index to 1.8 in 2020 down from 1.9 in 2016 but rose to 2.2 in 2022. Data for Grenada is not available for 2023 and 2024, however in 2024, Hurricane Beryl, a category 5 hurricane hit the outer island of Carriacou. The severe impact of Hurricane Beryl on Carriacou illustrates the growing climate vulnerability of Grenada's infrastructure, underscoring the urgent need for climate-resilient planning and disaster risk reduction measures.^{8 9} According to the World Bank (2024) the total estimated economic damages from the event amount to approximately US\$218 million (equivalent to XCD 589 million), representing 16.5 percent of Grenada's Gross Domestic Product (GDP) for 2023. This figure does not include damage to marine vessels such as fishing or recreational boats. The northern islands of Carriacou and Petite Martinique experienced the most severe impacts, accounting for approximately US\$134 million, or 82 percent of the country's total damage excluding the agriculture sector. Structural damage to buildings—both residential and non-residential—comprised nearly 50 percent of the total direct damage to physical assets. Additionally, infrastructure losses are estimated at 30 percent of the total damages, affecting essential systems such as electricity, telecommunications, water supply, jetties, and coastal infrastructure.¹⁰ The damages of Hurricane Beryl, however, was not comparable to Ivan in 2024, which still retains the title of the most devastating storm. Hurricane Ivan by comparison were equivalent to 130 percent of 2003 GDP despite wind speeds being similar.¹¹

Infrastructure accounts for approximately 43% of the National Adaptation Plan's (NAP)¹² estimated budget, and this investment is reflected in Grenada's consistently low hazard and exposure scores in global risk indices.

Despite its high level of exposure and vulnerability to climate-related hazards, Grenada is home to several important natural ecosystems that can serve as protective barriers and reduce risks of climate-related disasters. The Woburn Clarke's Court Bay Marine Protected Area ("Woburn Clarke's") contains the largest intact mangrove ecosystem in Grenada. The mangroves provide critical habitat and erosion protection over three miles of coastline. The area is an important nursery for commercial fish species. It provides nesting, roosting, and feeding areas for resident and migratory birds. It is also habitat for native iguanas, snakes, and a variety of terrestrial wildlife.¹³ It is located on Grenada's southeastern

⁷ INFORM is a collaboration of the Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness and the European Commission. The aim of the regional adaptation of the global INFORM GRI model for the Latin America and Caribbean region (LAC-INFORM RI) is to count with a risk tool that incorporates a set of risk indicators that capture the realities of the Latin America and Caribbean region (LAC) and provide a realistic comparison of the countries within the region: <https://DRRkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Results-and-data/moduleId/1782/id/386/controller/Admin/action/Results>

⁸ INFORM Risk Index. (2022). Global Risk Data Platform. Retrieved from <https://drmkc.jrc.ec.europa.eu/inform-index>

⁹ UNDRR. (2023). Regional Assessment of Disaster Risk in the Caribbean.

¹⁰ World Bank. (2024, August 1). Global Rapid Post-Disaster Damage Estimation (GRADE) Report: Hurricane Beryl 2024 – Grenada. <https://www.gfdr.org/en/publication>

¹¹ Ibid

¹² Government of Grenada. (2021). National Adaptation Plan (2020–2030). Ministry of Climate Resilience.

¹³ <https://www.seacology.org/project/35-grenada/>

coast, with fishing being one of the main economic earners. However, mangroves, and fringing reefs are being degraded resulting in coastal erosion and loss of property.

Grenada, therefore, has an opportunity to utilize **nature-based solutions** (NbS) to reduce risk against climate-related impacts on its vital infrastructure.¹⁴ The International Federation of Red Cross and Red Crescent Societies (IFRC) in collaboration with the Grenada Red Cross Society (GRCS) and other partners such as The Nature Conservancy (TNC) have implemented various projects in NbS in Grenada that demonstrate the potential of this methodology to reduce risk against climate-related impacts.¹⁵

One such project was a regional project, Resilient Islands by Design (RI)¹⁶ carried out in Jamaica, the Dominican Republic, and Grenada with the stated objective of the achieving resilient islands with empowered communities and governments that significantly increase investments in the protection of key ecosystems. The RI project used community-based vulnerability capacity assessments to identify vulnerable communities and developed a portfolio of locally tailored NbS (e.g., mangrove planting).

This report is an activity of the Ecological Connectivity and Community Resilience (ECCR) Project led by the International Federation of Red Cross and Red Crescent Societies (IFRC) in collaboration with National Societies and funded by the Caribbean Biodiversity Fund. The project aims to promote the sustainable management and restoration of ecosystems to enhance community resilience, reduce climate-related risks, and support biodiversity conservation and climate change mitigation in targeted communities across Jamaica and Grenada.¹⁷ The consultancy aims to conduct a legal and policy assessment of the Woburn Clarke's Court Bay Marine Protected Area to:

- i. Understand the situational analysis including the legal, policy, environmental, social, economic and political environment at the national level and local level (of Woburn Clarke's).
- ii. Determine the rights and interests of all stakeholders of the Woburn Clarke's area including private sector, public sector, civil society and community members.
- iii. Examine the potential benefits, opportunities and barriers for an ecosystem-based adaptation (EbA)¹⁸ intervention to rehabilitate and/or restore the mangroves in the Woburn Clarke's area with a view to reducing disaster risk and helping people adapt to the impacts of climate change.

¹⁴ IUCN. (2020). Global Standard for Nature-based Solutions. Retrieved from <https://www.iucn.org>

¹⁵ IFRC & TNC. (2020). Resilient Islands by Design: Project Overview. Retrieved from <https://resilient-islands.org>

¹⁶ Ibid.

¹⁷ IFRC (2025) TOR **Consultancy to conduct a legal and policy assessment of the Woburn Clarke's Court Bay Marine Protected Area in Grenada to determine the opportunities for an ecosystem-based intervention (EbA)**

¹⁸ CBD Secretariat. (2009). Connecting Biodiversity and Climate Change Mitigation and Adaptation. Retrieved from <https://www.cbd.int/doc/publications/cbd-ts-41-en.pdf>

- iv. Provide legal and policy recommendations to support the development of an advocacy strategy for an EbA intervention in Woburn Clarke's.
- v. The assessment should build on the previous learnings of the Grenada Synthesis Report, taking into account the policy and legislative framework at the national and local levels and the recommendations identified by stakeholders.

1.2. Methodology

Effective stewardship of Woburn Clarke's Court Bay hinges on a clear understanding of the legal and policy currents that govern its waters. This legal and policy assessment began by mapping Grenada's key legislative instruments through a comprehensive mapping of laws, policies, Standard Operating Procedure (SOPs), and practices, that subsequently led to their review to pinpoint barriers and opportunities for disaster risk reduction (DRR), NbS, and ecosystem-based adaptation (EbA).

The documents were catalogued to include all DRR/NbS/EbA-related policies, adding prior IFRC outputs especially the [International Disaster Response Law in Grenada: A Desk Review on Legal Preparedness for International Disaster Response](#). Each document was assessed against the IFRC benchmarking tools of the Disaster Risk Governance Guidelines¹⁹ and the Checklist on Law and Disaster Risk Reduction,²⁰ capturing internal/external implementation factors via an adapted tool (Appendix 1)

The tool emphasized checklist items specific to NbS & EbA to flag gaps and opportunities. The desk review was extended to national/local laws on environmental conservation, marine/coastal management, sustainable development, land-use planning, and natural-resource management, DRR legislation, plus international benchmarks (CBD, IUCN NbS Standards, UNEP, FAO, UNFCCC). EbA/NbS provisions in the policies were systematically extracted and grouped by theme (definitions, implementation, M&E, finance, stakeholder roles). A comparison matrix aligning national provisions with international best-practice criteria to highlight strengths, gaps, and deviations.

The legal and policy analysis was supplemented by an abbreviated Applied Political Economic Analysis. An APEA, according to the United Kingdom foreign, Commonwealth and Development Office, offers concepts, questions, and tools to better understand the political context of development work. It reveals the real dynamics behind policies and decisions—often counter-intuitive—and helps identify practical entry points, constraints, and realistic strategies for engagement.²¹ The APEA dimensions examined in the analysis are presented in Box 1.

¹⁹ International Federation of Red Cross and Red Crescent Societies (IFRC). (n.d.). *Guidelines on disaster risk governance*. IFRC Disaster Law. <https://disasterlaw.ifrc.org/DRMguidelines> and

²⁰ International Federation of Red Cross and Red Crescent Societies (IFRC). (2020). *Checklist on law and disaster risk reduction (Pilot version)*. <https://disasterlaw.ifrc.org/media/1354>

²¹ Whaites, A., Piron, L.-H., Rocha Menocal, A., & Teskey, G. (2023). *Thinking and working politically: Learning from practice*. Foreign, Commonwealth & Development Office (FCDO) and the Thinking and Working Politically Community of Practice.

Box 1: APEA Dimensions for Woburn Clarke's MPA

Environmental Dimension

Condition and trends of critical ecosystems relevant to EbA (e.g., coral reefs, seagrass beds, mangroves).

Pressures and threats (e.g., coastal development, pollution, overfishing, climate change impacts).

Social Dimension

Community dependence on marine resources for livelihoods (fishing, tourism, etc.).

Social cohesion, cultural values, and local attitudes toward conservation and EbA.

Vulnerable groups and equity considerations.

Compile demographic, economic, and environmental data from national statistical offices, international organizations (e.g., FAO, UNDP, IUCN), and NGOs working in Grenada.

Economic Dimension

Economic sectors influencing MPA governance (fisheries, tourism, coastal development).

Public and private financial flows (funding sources, investment in MPA infrastructure, etc.).

Incentives and disincentives for adopting EbA at both the national and local levels.

Political and Institutional Dimension

National political priorities (e.g., climate change policies, environmental protection strategies, disaster risk reduction) and how they translate into local practice.

Formal and informal institutions (laws, regulations, customary norms) that govern the MPA.

Power relations among key actors (government agencies, civil society, private sector, local communities).

2. Situational Analysis

2.1. History of the Woburn Clarke's Court Bay MPA

The Woburn Clarke's Court Bay Marine Protected Area (MPA) in Grenada was initiated in the 1990s by the Fisheries Division of the Ministry of Agriculture, Forestry, and Fisheries through a participatory process involving consultations with the local community. It was officially declared as an MPA in 2001 under statutory rules and orders.^{22 23} Originally the purpose of the Woburn Clarke Court Bay MPA emphasized marine stock-recruitment sanctuary to conserve habitats such as mangroves, sea grass beds, and shallow coral reefs, effectively creating a protected zone free from exploitation.²⁴

During the early 2000s, the management focus began to shift from strict conservation toward a multi-use approach balancing both natural resource conservation and utilization. Economic development pressures led to the introduction of infrastructure such as marinas, a large-scale tourist hospitality facility, and plans for a desalination plant within the MPA. This evolution transformed the site from a marine sanctuary into a multi-user area where traditional fishers, residents, tourism operators, and marina communities interacted, sometimes contentiously (Ibid).

Despite this transformation, the conservation value of the area remained notable, as it contains Grenada's largest intact mangrove ecosystem and important coastal habitats that support fisheries and protect biodiversity. Approximately 4.2 square kilometres are designated under protection, covering significant coral reef and seagrass areas.

2.1.1. Geography and Ecology of the Woburn Clarke's Court Bay Marine Protected Area (WCCBMPA)

The **WCCBMPA** is located on the southeastern coast of **Grenada**, encompassing approximately 4.6 square kilometres of nearshore marine space, including Woburn Bay, Clarke's Court Bay, and adjacent coastal environments.²⁵ The MPA lies within St. George Parish, bordered by the communities of Woburn, Calivigny, and Fort Jeudy to the north and west, and extends seaward to encompass a complex mosaic of **mangroves, seagrass beds, coral reefs, and coastal wetlands**.²⁶

The area is characterized by:

²² Government of Grenada. (2001). *Fisheries (Marine Protected Areas) Order*, SRO 77 of 2001.

²³ Government of Grenada. (2006). *Management Plan for the Woburn Clarke's Court Bay MPA*. Fisheries Division, Ministry of Agriculture.

²⁴ Ibid (Government of Grenada. (2006)).

²⁵ Government of Grenada (2006), 6.

²⁶ Finlay, J. (2012). *Marine Protected Areas and Community Engagement in Grenada: Case Study of Woburn Clarke's Court Bay MPA*. University of the West Indies.

- Shallow bays and inlets that offer natural harbourage for yachts and fishing boats;
- Low-lying coastal plains with increasing development pressure from tourism and residential housing;
- Volcanic bedrock and alluvial soils, typical of Grenada's terrain, influencing sediment runoff and erosion patterns;
- A mix of public and privately held lands, including tourism developments and small-scale agriculture along the shoreline.

This region is ecologically and economically significant due to its proximity to the capital, St. George's, and its importance as a hub for artisanal fishing, yachting, and recreational tourism.

The WCCBMPA hosts diverse and interconnected ecosystems, including:

- Mangrove forests (primarily *Rhizophora mangle* and *Avicennia germinans*), which provide critical nursery habitat for juvenile fish, buffer storm surges, and stabilize the shoreline.²⁷
- Seagrass beds (*Thalassia testudinum* and *Syringodium filiforme*) that support herbivorous species like sea turtles and are essential for sediment stabilization and carbon sequestration.²⁸
- Fringing coral reefs with species such as *Acropora palmata* and *Montastraea annularis*, offering rich biodiversity and protective services against coastal erosion.²⁹

These ecosystems support a wide array of marine species, including commercially important fish (e.g., snapper, grunt, parrotfish), lobsters, sea urchins, and migratory birds. Additionally, the WCCBMPA provides ecosystem services essential to livelihoods, such as fisheries productivity, shoreline protection, and tourism appeal.

Despite its ecological richness, the area is under pressure from coastal development, pollution from land-based sources, anchor damage from yachts, and climate-related impacts such as coral bleaching and sea-level rise.³⁰ As such, the area has been designated for zoning, management planning, and stakeholder co-management under Grenada's broader marine spatial planning framework.

WCCBMPA's ecological complexity underscores its importance for ecosystem-based management and nature-based solutions (NbS). The intricate interactions among the area's ecosystems enhance the area's capacity to provide essential ecosystem services such as shoreline protection, carbon sequestration, and water quality regulation. As such, it is a strategic site for advancing ecosystem-based management approaches that consider the interdependence of species, habitats, and human activities. Its ecological features also make it an ideal candidate for implementing NbS aimed at

²⁷ Kathiresan, K., & Bingham, B. L. (2001). *Biology of mangroves and mangrove ecosystems*. *Advances in Marine Biology*, 40, 81–251.

²⁸ UNEP. (2009). *Seagrass Ecosystems: A Brief Review for the Caribbean*. United Nations Environment Programme – Caribbean Environment Programme.

²⁹ Burke, L., Reyter, K., Spalding, M., & Perry, A. (2011). *Reefs at Risk Revisited*. World Resources Institute. Retrieved from <https://www.wri.org/research/reefs-risk-revisited>

³⁰ Ince, D. (2015). *Status of Coral Reefs in Grenada: Impacts and Management Responses*. Ministry of Agriculture, Lands, Forestry, Fisheries and the Environment, Government of Grenada.

building climate resilience, reducing disaster risk, and supporting sustainable development in surrounding communities. NbS related activities can include mangrove restoration, community-managed fishing zones, and integrated monitoring systems that draw on both scientific data and traditional ecological knowledge. Effective governance requires collaboration among public agencies, local fishers, researchers, and the tourism sector to maintain ecological health while supporting sustainable use.³¹

2.2. Social and Power Dynamics

The WCCBMPA is influenced by a complex network of actors spanning community groups, civil society, private sector entities, and public institutions—each with distinct interests and varying degrees of formal and informal power. These actors are described in detail below.

2.2.1. Community Members (Residents, Men, Women, Youths)

The WCCBMPA is situated on Grenada's southeastern coast and is bordered by several communities that interact with and depend on the marine and coastal resources within the protected area. The key communities include:

- **Woburn:** A traditional fishing village directly adjacent to the MPA, with a strong cultural connection to the bay and its resources.
- **Calivigny:** Located to the east of the MPA, this community is experiencing growth in residential and tourism development.
- **Clarke's Court Bay / Egmont:** This area includes marina developments and residential communities, with increasing private sector investments.
- **Westerhall:** Positioned north of the MPA, Westerhall is a mix of residential and agricultural land uses, with potential impacts on the bay through watershed runoff.
- **Mount Hartman / L'Anse aux Épinés** while not directly adjacent, these communities are ecologically connected to the MPA through shared coastal ecosystems and are important for broader conservation efforts. A community profile matrix of the communities is outlined below in Table 1.

Table 1: Community Profiles of the WCCBMPA

Community	Population	Key Characteristics	Primary Livelihoods	Engagement with MPA
Woburn		Traditional fishing village; strong cultural ties	Fishing, sea moss farming	High; active participation

³¹ Cox, C., Gray, S., & Boodram, L. (2020). *Community-based Governance of Marine Protected Areas in the Caribbean: Lessons from Grenada*. *Coastal Management*, 48(3), 210–229. <https://doi.org/10.1080/08920753.2020.1766932>

Calivigny		Growing residential and tourism area	Tourism, small-scale agriculture	Moderate; emerging involvement
Clarke's Court Bay / Egmont		Marina developments; residential communities	Yachting services, tourism	Moderate; private sector-led
Westerhall		Residential and agricultural mix	Agriculture, commuting workforce	Low; indirect environmental impact
Mount Hartman / L'Anse aux Épinés		Ecologically connected areas	Tourism, conservation activities	Variable; conservation-focused

The community members have customary rights of access, access to marine resources;³² participation in decision-making through consultations and community meetings.³³ As can be seen in Table 1, the interests of the communities are varied but includes sustainable livelihoods (fishing, sea moss farming), shoreline protection, clean water, youth opportunities, and cultural preservation. In terms of power dynamics, communities and their members hold significant moral and experiential authority but limited institutional power. Community members are often underrepresented in formal marine governance.^{34 35}

However, there are also cross-cutting community power relations. Grenada, like many Caribbean nations, is shaped by a post-colonial history, deeply rooted cultural norms, and evolving gender dynamics. While the country has made notable strides in promoting gender equality—particularly in education and public sector participation—structural inequalities and persistent stereotypes continue to affect the lived experiences of women, men, and non-binary individuals.³⁶ At the national level, Grenada has achieved the highest percentage of women in parliament in the Caribbean Community (CARICOM) countries and globally-46.67 percent in 2018.³⁷ Whilst that number has declined to 31.3 percent in 2025, the percentage is still considerable regionally and globally. Women are also very prominent in the public service management with a high number of permanent secretaries. For the past 10 years, women are the majority of permanent secretaries.³⁸ The Minister and permanent secretary of the Ministry of Climate Resilience, The Environment and Renewable Energy are both females.

³² Key Informant Interview 2025

³³ Findlay, James (2018) *Task 4 Report Part 1–4 Consolidated II: Ecological connectivity and community resilience in Grenada and Jamaica*. Woburn Clarke's Court Bay Marine Protected Area (WCCBMPA) ecological profile and policy assessment.

³⁴ Ibid citing 2015

³⁵ Key Informant Interview 2025

³⁶ UN Women. (2021). *Barbados and Eastern Caribbean Gender Equality Profile: A Review of the Situation in Grenada*. United Nations Entity for Gender Equality and the Empowerment of Women. Retrieved from <https://caribbean.unwomen.org>

³⁷ Inter-Parliamentary Union. (2025). Grenada: House of Representatives. *Parline database*. Retrieved June 22, 2025, from <https://data.ipu.org/parliament/GD/GD-LC01/>

³⁸ Government of Grenada (2025), www.gov.gd

According to the Government of Grenada, the gender composition of Statutory Bodies and State Boards as of April 2019 is 285 total board members, 219 (77%) are male and just 66 (23%) are female. The most pronounced gender imbalances occur in the Ministries of Health, Infrastructure, and Agriculture. By contrast, the Ministry of Social Development, Housing & Community Empowerment demonstrates the strongest representation of women, with females comprising 46% of its board members.³⁹

Structural inequalities and persistent stereotypes are also constant in natural resources management and MPA governance. In general women and youth voices are underrepresented in marine governance, despite being primary users and affected groups. Women, especially in rural areas, face greater vulnerabilities to climate shocks due to livelihood dependence on natural resources and limited adaptive capacity.⁴⁰ While Grenada has made notable strides in gender equality within the public sector—achieving one of the highest parliamentary representation rates in the Caribbean (31.3% in 2025)—women remain underrepresented in marine governance.⁴¹ Only 23% of board members on statutory bodies are female, and participation in MPA decision-making processes is typically limited to supportive rather than leadership roles.⁴² This disparity is particularly stark in coastal and rural areas, where women depend heavily on climate-sensitive natural resources but face systemic barriers to land ownership, finance, and institutional voice.⁴³

Stakeholder Power and Interest Matrix		
Power or Influence	High Power, Low Interest	High Power, High Interest
	Keep Satisfied - Public Sector Ministries not directly involved in daily MPA governance - Tourism Development Board	Manage Closely - Fisheries Division - Ministry of Climate Resilience - Private Marina Operators - Key Local Government Representatives

³⁹ Division of Gender and Family Affairs, Ministry of Social Development, Housing and Community Empowerment. (2019, May). Grenada comprehensive national review on implementation of the Beijing Declaration and Platform for Action (Beijing + 25). https://www.cepal.org/sites/default/files/informe_beijing25_grenada_final.pdf

⁴⁰ UNDP. (2022). *Gender and Climate Change in the Caribbean: Policy Brief for Resilience and Inclusion*. United Nations Development Programme, Barbados and the Eastern Caribbean. Retrieved from <https://www.undp.org/barbados>

⁴¹ Inter-Parliamentary Union. (2025). Grenada: House of Representatives. Parline: the IPU's open data platform. Retrieved June 22, 2025, from <https://data.ipu.org/parliament/GD>

⁴² Division of Gender and Family Affairs, Ministry of Social Development, Housing and Community Empowerment. (2019). Grenada comprehensive national review on implementation of the Beijing Declaration and Platform for Action (Beijing +25). Retrieved from https://www.cepal.org/sites/default/files/informe_beijing25_grenada_final.pdf

⁴³ Finlay, Marine Protected Areas and Community Engagement in Grenada, 6.

	Low Power, Low Interest	Low Power, High Interest
	Monitor with Minimum Effort - Media outlets covering marine topics - General public not residing near WCCBMPA	Keep Informed - Local Residents near the WCCBMPA - Artisanal and Small-Scale Fishers - Environmental NGOs - Academic Institutions (e.g., SGU)
Level of Interest		

Table 2: Stakeholder Power and Interest Matrix.

Stakeholder Group	Power	Interests
Community Members	Low formal/institutional power; high moral and experiential authority	Sustainable livelihoods, shoreline protection, youth inclusion, cultural preservation
Civil Society Organizations (CSOs)	Moderate soft power through community trust and donor backing; limited formal decision-making authority	Environmental stewardship, community development, education, gender equity
Private Sector Stakeholders	High financial and political influence; lobbying capacity and strategic partnerships	Economic returns, coastal access, infrastructure, ecosystem services, regulatory clarity
Fishers (Artisanal and Small-Scale)	Low institutional power; high ecological knowledge; variable based on organization strength	Access to fishing grounds, infrastructure, inclusion in decision-making, sustainable stocks
Public Sector Stakeholders	High regulatory and legal authority; control over planning, funds, and compliance	Sustainability, treaty compliance, blue economy, disaster risk reduction, public-private partnerships
Academic and Technical Institutions	High epistemic authority; advisory influence dependent on partnerships and donor alignment	Research, policy advising, capacity building, marine monitoring, scientific application

2.2.2. Civil Society Organizations (CSOs) (NGOs, Faith-Based, Environmental Groups)

Civil society organizations play a crucial role in participatory governance structures. Many CSOs in Grenada have a formal right to participate in environmental and development decision-making processes, particularly where co-management frameworks or multi-stakeholder committees are in place. When formally recognized or engaged by national agencies or MPA authorities, CSOs can contribute to policy development, community outreach, and oversight mechanisms. Their rights are also grounded in regional agreements and national policies that promote inclusive governance and public participation in environmental management.

CSOs often advocate for sustainable and equitable use of natural resources. Their primary interests within the WCCBMPA include:

- **Environmental stewardship:** Promoting biodiversity conservation, sustainable fisheries, and restoration of marine ecosystems such as mangroves and coral reefs.
- **Community development:** Supporting coastal livelihoods, food security, and sustainable tourism that benefits residents.
- **Education and awareness:** Raising public understanding about marine protection, ecosystem services, and climate resilience.
- **Gender equity and inclusion:** Advocating for the empowerment of women, youth, and marginalized groups in coastal governance and livelihood initiatives.

These interests often intersect with international agendas on sustainable development (e.g., SDG 14 – Life Below Water) and climate adaptation.

Civil society organizations possess significant soft power through their grassroots presence, community trust, and convening ability. They often serve as intermediaries between local communities and state institutions, translating technical language into culturally relevant knowledge and ensuring that vulnerable voices are heard.

However, their actual influence is context dependent. UN Agencies such as UNDP and civil society organisations (CSOs) with strong donor backing (e.g., from The Nature Conservancy (TNC), Global Environment Facility, the Inter-Agency Group of Organisations (IADGO) or international NGOs) may have more leverage in advocacy, project implementation, and shaping policy dialogues. Conversely, their capacity to influence state decisions or formal marine spatial planning processes may be limited without active partnerships with government ministries or statutory recognition.

In some cases, CSOs must navigate political sensitivities, particularly when advocating for accountability, environmental justice, or rights-based approaches that may challenge entrenched interests. Nonetheless, their role is indispensable in ensuring bottom-up support for MPA initiatives and in bridging the gap between science, policy, and local realities.

Key CSOs include the Woburn Community Development Association with its mission to empower the residents of Woburn and surrounding communities by fostering inclusive, sustainable social and economic development. WCDA aims to:

- Mobilize local resources and expertise to improve quality of life.
- Advocate for community needs in planning and infrastructure projects.
- Promote environmental stewardship and resilience.
- Build social cohesion through cultural, educational, and recreational initiatives.

By combining grassroots participation with structured governance, the Woburn Community Development Association strives to catalyse local leadership, attract partnerships, and deliver tangible improvements for all residents.^{44 45}

The Grenada Red Cross Society (GRCS) enjoys a distinctive legal standing in national law as an auxiliary to the public authorities, a status conferred by the International Federation's statutes and reinforced through domestic legislation. As an officially recognized partner of government in humanitarian and disaster management efforts, the GRCS is uniquely empowered to design and deliver nature-based solutions (NbS) programmes—such as coastal mangrove rehabilitation, community reforestation, and urban green-space restoration—under the same mandate that guides state agencies. This auxiliary role not only streamlines coordination with line ministries (e.g., Environment, Agriculture, and Disaster Management) but also grants the Red Cross privileged access to government resources, data, and emergency response frameworks, ensuring that its NbS interventions are both technically robust and fully integrated into Grenada's broader resilience and adaptation strategies.

2.2.3. Private Sector Stakeholders

Private sector actors operating within or adjacent to the WCCBMPA hold a range of legal and regulatory rights. These typically include land ownership or long-term leases, business operation permits, and in some cases, exclusive concessions or special use agreements authorized by the government. In Grenada, such rights are particularly relevant to marina operators, hotel and villa developers, and tourism service providers, many of whom depend directly on coastal and marine ecosystems to sustain their businesses. These rights are governed under national laws such as the *Physical Planning and Development Control Act* and the *Fisheries Act (2013)*⁴⁶ and are sometimes reinforced by investment incentives or tourism development frameworks.

Private enterprises in and around the MPA have strong interests in:

- Economic returns and business continuity, particularly in sectors tied to coastal aesthetics and marine recreation.

⁴⁴ Woburn Community Development Association. (2022). *Constitution and By-Laws*. Woburn, GB: WCDA Secretariat.

⁴⁵ Woburn Community Development Association. (2023). *Strategic Plan 2023–2027: Empowering Community Resilience*. Woburn, GB: WCDA Publications.

⁴⁶ Government of Grenada. (1986, amended 2013). *Fisheries Act (Cap. 108) and Fisheries (Marine Protected Areas) Regulations*.

- Access to coastal and marine infrastructure, such as jetties, berths, and mooring areas.
- Ecosystem services such as clean water, vibrant coral reefs, and protected beaches, which directly impact their market appeal.
- Protection of investments, including risk reduction from climate events, pollution, or regulatory uncertainty.

In WCCBMPA, examples of such businesses include:

- Clarke's Court Boatyard & Marina – A major yachting and service facility catering to local and international vessels.
- Le Phare Bleu Marina and Resort – A waterfront property integrating marine access with luxury accommodations.
- Rumboat Retreat and other boutique tourism operators offering eco-tourism and dive-related experiences.
- Aquaculture ventures, including small-scale pilot projects for sea moss and fish farming, which depend on access to secure, clean coastal waters.

The private sector often exercises disproportionate influence in coastal governance due to its financial capital, ability to generate employment, and strategic partnerships with political actors. In investment-heavy zones like WCCBMPA, private developers can shape local planning outcomes, influence MPA boundaries, and delay or sway environmental regulations. Lobbying capacity, proximity to decision-makers, and control over economic narratives (e.g., framing environmental concerns as threats to "development") enhance their leverage.

However, this influence can be a double-edged sword. If aligned with sustainability goals, the private sector can be a vital ally in marine conservation, funding restoration efforts and adopting voluntary eco-certification schemes. Conversely, unchecked development—such as mangrove clearing or dredging—can compromise ecosystem integrity and exacerbate social inequities.⁴⁷

In WCCBMPA, the balancing of private investment with ecological sustainability remains a key governance challenge. Multi-stakeholder platforms and Environmental Impact Assessments (EIAs) are critical tools for managing this dynamic, although enforcement capacity remains limited.^{48 49}

2.2.4. Fishers (Artisanal and Small-Scale Fishers)

Fishers—particularly those engaged in small-scale and subsistence fishing—have long-standing customary rights to access and use marine resources in and around the Woburn Clarke's Court Bay Marine Protected Area (WCCBMPA). While formal fishing licenses are required under the *Fisheries Act (1986)*, many artisanal fishers operate informally or with limited documentation. Their rights are also shaped by traditional use patterns and community norms that predate the designation of the MPA.

⁴⁷ Cox, Gray, and Boodram, *Community-based Governance*, 8.

⁴⁸ Finlay, *Marine Protected Areas and Community Engagement*, 7.

⁴⁹ Ince, *Status of Coral Reefs in Grenada*, 8.

These include rights to access landing sites, moor boats, and harvest from nearshore reefs and seagrass beds.

Fisherfolk rely on healthy marine ecosystems for their economic survival, cultural identity, and food security. Their key interests include:

- Sustaining fish stocks and reef habitats that support traditional target species (e.g., snapper, jacks, lobster).
- Access to traditional fishing grounds, many of which may overlap with zones under stricter protection or development pressure.
- Improved infrastructure such as jetties, cold storage, and safe mooring areas.
- Recognition and participation in decision-making that affects their livelihoods.

As primary users of the marine environment, fishers have detailed ecological knowledge and practical insights into changes in the coastal ecosystem. However, they may not always be engaged systematically in planning or enforcement discussions. Fisherfolk are among the most directly affected by the designation and enforcement of marine protected areas. Despite this, they often hold limited formal power in decision-making processes. Many operate individually or in loosely organized groups, without the institutional strength of private sector associations or government agencies. Their influence depends on:

- The strength of fisher cooperatives or associations (e.g., Southern Fishermen Cooperative).
- Support from civil society or NGO intermediaries who advocate for inclusive governance.
- Trust relationships with MPA officers and fisheries authorities.

Without meaningful inclusion, fisherfolks may resist conservation rules—particularly if perceived as limiting access without compensation or benefit. However, with genuine co-management and benefit-sharing mechanisms, fisherfolks can become strong allies in marine stewardship and enforcement.

2.2.5. Public Sector Stakeholders-Fisheries Division, Ministry of Climate Resilience

Public sector institutions have legally mandated roles in the governance and oversight of marine protected areas. In Grenada, the Fisheries Division (under the formerly Ministry of Agriculture and Lands, Fisheries and Cooperatives now Blue Economy and Marine Affairs) holds regulatory authority under the Fisheries Act (1986) and subsequent amendments. It is responsible for issuing licenses, setting regulations for MPAs, and managing marine resources. The Ministry of Climate Resilience, the Environment and Renewable Energy plays a leading role in integrating climate adaptation into marine and coastal policy, aligning with national and international obligations (e.g., National Determined Contributions (NDCs) under the Paris Agreement). These public actors hold statutory rights to establish and enforce marine zoning, impose penalties, approve development projects, and coordinate inter-agency responses to marine threats. The public sector's interests in the WCCBMPA are multi-dimensional:

- Sustainable resource use: Ensuring long-term viability of fish stocks and marine habitats to support food security and economic activity.
- International compliance: Meeting obligations under environmental treaties such as the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the Cartagena Convention.
- Disaster risk reduction: Promoting healthy ecosystems (e.g., mangroves, coral reefs) as natural buffers against storms, coastal erosion, and flooding.
- Blue economy development: Fostering sustainable livelihoods from fisheries, tourism, aquaculture, and marine research, in line with Grenada's Blue Growth⁵⁰ vision.

Their interests also include promoting public-private partnerships, securing donor financing for coastal resilience, and achieving targets in the National Biodiversity Strategy and Action Plan (NBSAP) and Climate Change Adaptation Policy.

The public sector is a central actor in shaping marine governance. Ministries and regulatory agencies define the legal and institutional architecture of MPAs, including:

- Zoning designations (e.g., no-take, multiple-use areas)
- Fishing and tourism permit
- Environmental impact assessments (EIAs)
- Community consultation processes

These bodies also control access to public funds, donor projects, and technical expertise. Their influence is reinforced by institutional mandates, legal instruments, and international diplomacy. However, their effectiveness can be constrained by:

- Limited enforcement capacity

Regulatory agencies like the Fisheries Division often face human resource and equipment shortages that hinder regular monitoring and enforcement within the MPA. With only a small number of officers available for coastal surveillance, illegal activities such as unauthorized fishing, mangrove clearing, or anchoring in protected areas may go unpenalized, undermining conservation goals.

- Bureaucratic fragmentation

Marine governance responsibilities in Grenada are divided across multiple ministries and agencies—including the Ministry of Climate Resilience, the Ministry of Agriculture (which formerly housed the Fisheries Division), and various planning and tourism bodies. This institutional overlap can result in unclear mandates, delayed decision-making, and inconsistencies in policy implementation, especially when coordination mechanisms are weak or underdeveloped.

- Short-term political pressures

⁵⁰ Patil, Pawan G.; Diez, Sylvia Michele. *Grenada - Blue growth coastal master plan (English)*. Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/358651480931239134>

Policy continuity and long-term planning are often disrupted by political cycles or leadership change as projects or partnerships initiated under one administration may be deprioritized or altered under the next, affecting momentum and stakeholder trust. This can be especially problematic for MPAs, where ecological and community outcomes require sustained, long-term interventions.

- Weak inter-agency coordination

Despite efforts to establish multi-sectoral platforms, coordination between agencies responsible for climate adaptation, marine spatial planning, disaster risk reduction, and fisheries management remains inconsistent. This fragmentation limits the integration of data, the streamlining of procedures (e.g., permitting, zoning), and the harmonization of enforcement strategies. As a result, opportunities for holistic, ecosystem-based management are frequently missed, and duplication of efforts or conflicting mandates may arise.

In the WCCBMPA context, the Fisheries Division has been instrumental in boundary definition, compliance monitoring, and stakeholder coordination. Its role is especially critical for facilitating co-management arrangements and integrating climate resilience into marine spatial planning.^{51 52}

2.2.6. Academic and Technical Institutions (e.g., St. George's University, Marine Biologists, Environmental Consultants)

Academic and technical institutions often operate with institutional agreements or memoranda of understanding that allow access to marine and coastal zones for research, monitoring, and training purposes. In the case of WCCBMPA, St. George's University (SGU) has historically played a key role in marine ecology research and community-based education. These institutions are also frequently involved in environmental impact assessments (EIAs) and serve in an advisory capacity to government agencies on coastal planning and biodiversity issues.

Their rights, while not statutory in nature, are grounded in Grenada's development and environmental planning systems, where data-driven decision-making and scientific expertise are increasingly recognized as vital to sustainable development.⁵³ Academic and technical stakeholders are primarily motivated by:

- Scientific inquiry: Conducting field research to assess coral reef health, fisheries dynamics, mangrove coverage, water quality, and biodiversity.
- Knowledge production: Generating peer-reviewed publications, reports, and policy briefs to inform both local and global audiences.

⁵¹ Finlay, *Marine Protected Areas and Community Engagement*, 7.

⁵² Government of Grenada. (2020). *Grenada Blue Growth Coastal Master Plan*. Ministry of Climate Resilience, The Environment, Forestry, Fisheries and Disaster Management. Retrieved from <https://climatefinance.gov.gd>

⁵³ Government of Grenada. (2016). *National Sustainable Development Plan 2030: Towards Vision 2030*. Ministry of Economic Development, Planning, Trade and Cooperatives. Retrieved from <https://www.gov.gd>

- Applied science: Supporting marine spatial planning, ecosystem restoration, and monitoring frameworks aligned with international agreements like the CBD and SDG 14.
- Capacity building: Engaging students and community members in citizen science, internships, and participatory research.

In WCCBMPA, SGU and partners have contributed data for marine baseline assessments, community risk mapping, and marine protected area performance indicators. These efforts support both national planning and international reporting obligations.

Academic institutions possess high epistemic authority—their data and recommendations are often trusted and cited in policy dialogues. They are seen as credible, neutral, and grounded in evidence. However, their influence in governance is often indirect, shaped by their relationships with regulatory agencies or donors. Without formal policy mandates or political capital, their role is typically advisory. Nonetheless, their power can grow when:

- Their findings align with donor priorities or national commitments (e.g., Paris Agreement, Aichi Biodiversity Targets).
- They facilitate co-learning platforms that connect communities, policymakers, and practitioners.
- They produce actionable data used in EIAs, zoning plans, or resilience strategies.

Collaborations between SGU and government ministries—particularly the Ministry of Climate Resilience and the Fisheries Division—have helped bridge science and policy in coastal zone management. Yet, long-term influence often depends on institutional continuity, funding, and the receptiveness of political actors to scientific input.^{54 55}

2.3. Threats to the WCCBMPA

Despite its ecological richness and socio-economic value, the WCCBMPA faces a range of anthropogenic and environmental threats that jeopardize its long-term sustainability. These threats affect the health of marine ecosystems, undermine community livelihoods, and challenge the effective implementation of conservation and resilience strategies.

2.3.1. Coastal Development and Habitat Degradation

Rapid coastal development for residential, tourism, and marina infrastructure poses significant pressure on the WCCBMPA. Construction near mangroves and seagrass beds leads to:

⁵⁴ Cox, Gray, and Boodram, *Community-based Governance*, 8.

⁵⁵ Leith, P. (2018). *Challenges to Integrating Science into Policy in Small Island Developing States: Lessons from Climate Change Adaptation in the Caribbean*. *Environmental Science & Policy*, 83, 109–117. <https://doi.org/10.1016/j.envsci.2018.02.009>

- Loss of critical habitats through land reclamation and deforestation;
- Increased sedimentation and turbidity from runoff, which smothers coral reefs and seagrasses;
- Physical disturbances from boat docks and seawalls, fragmenting habitats and altering water flow (Finlay, 2012; Ince, 2015).

2.3.2. Pollution from Land-Based Sources

Non-point source pollution (contamination caused by rainfall moving over and through the ground, which picks up and carries away natural and human-made pollutants and deposits them into rivers, wetlands, coastal waters, and groundwater)⁵⁶ is a major threat, particularly from:

- **Grey water discharge** and untreated sewage from surrounding communities and yachts;
- Agricultural runoff carrying nutrients and pesticides;
- Solid waste and marine litter entering through storm drains or direct dumping.

These pollutants degrade water quality, contribute to eutrophication, and increase susceptibility to coral disease and algal blooms (Burke et al., 2011).

2.3.3. Unsustainable Fishing Practices

Although small-scale fishers are a vital part of the local economy, overfishing and illegal or unregulated practices threaten reef fish populations. Specific issues include:

- Decline of important commercial species such as parrotfish, snapper, and lobster;
- Use of gear that damages benthic habitats, such as gill nets and fish pots; and
- Poaching within no-take or restricted zones due to weak enforcement.

This undermines both biodiversity and long-term food security for coastal communities.⁵⁷

2.3.4. Anchoring and Recreational Impacts

WCCBMPA is a popular anchorage site for yachts and recreational vessels, especially in Clarke's Court Bay and Hog Island. Without adequate mooring infrastructure or clear zoning, this results in:

- Anchor damage to coral and seagrass beds;
- Disturbance of marine life from noise, boat traffic, and fuel spills;
- Conflicts between tourism operators and subsistence users (SGU, 2014).

⁵⁶ U.S. Environmental Protection Agency. (n.d.). *Nonpoint source (NPS) pollution*. Retrieved June 23, 2025, from https://www.epa.gov/nps?utm_source=chatgpt.com

⁵⁷ Ince, *Status of Coral Reefs in Grenada*, 8.

2.3.5. Climate Change and Natural Hazards

Climate-related threats compound existing pressures on the ecosystem, including:

- Coral bleaching events due to rising sea temperatures;
- Mangrove dieback linked to saline intrusion and prolonged drought;
- Coastal erosion and flooding from stronger storm surges and sea-level rise.

These events reduce the resilience of marine and coastal habitats and impact community safety and livelihoods.⁵⁸

In addition, the recent emergence of the brown macroalgae *Sargassum* spp. (e.g., *S. natans* and *S. fluitans*) along Grenada's shorelines poses both immediate and long-term threats.⁵⁹ Mass strandings of *Sargassum* can:

- **Smother beach ecosystems:** Thick mats prevent light penetration, killing dune-stabilizing vegetation and degrading critical turtle-nesting habitat.⁶⁰
- **Degrade water quality:** As the seaweed decomposes, it releases hydrogen sulfide and ammonia, causing foul odors, reducing dissolved oxygen, and harming nearshore marine life.⁶¹
- **Impede tourism and local livelihoods:** Unsightly, odorous piles discourage beachgoers, undermining tourism revenues and affecting businesses that depend on clean, accessible shores.^{62 63}
- **Disrupt fisheries:** Floating *Sargassum* rafts can entangle fishing gear and alter coastal currents, making traditional fishing grounds less productive.

Together, these impacts threaten both Grenada's coastal biodiversity and the socio-economic well-being of its coastal communities.

⁵⁸ IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. Retrieved from <https://www.ipcc.ch/report/ar6/wg2>

⁵⁹ Key Informant Interview 2025

⁶⁰ Hakai Magazine. (2021, January 15). Seaweed Is Putting Sea Turtles in a Hot Mess. Retrieved June 23, 2025, from <https://hakaimagazine.com/news/seaweed-is-putting-sea-turtles-in-a-hot-mess>

⁶¹ U.S. Environmental Protection Agency. (2025). *Sargassum Inundation Events (SIEs): Impacts on human health*. Retrieved June 23, 2025, from <https://www.epa.gov/habs/sargassum-inundation-events-sies-impacts-human-health>

⁶² The Guardian. (2024, April 11). *Toxic gas, livelihoods under threat and power outages: how a seaweed causes chaos in Caribbean*. Retrieved June 23, 2025, from <https://www.theguardian.com/environment/2024/apr/11/toxic-gas-livelihoods-under-threat-and-power-outages-how-sargassum-seaweed-causes-chaos-in-caribbean>

⁶³ Food and Agriculture Organization of the United Nations. (2023). *Impacts of Sargassum on marine resources in the region*. FAO Open Knowledge Repository. Retrieved June 23, 2025, from <https://openknowledge.fao.org/server/api/core/bitstreams/67016b1b-08d1-4770-ae4a-014ba40e461c/content>

2.3.6. Governance and Enforcement Gaps

Effective management is hindered by:

- Limited enforcement capacity, including staffing and patrol boats;
- Overlapping mandates among government ministries and local authorities;
- Weak stakeholder coordination and lack of sustainable financing.

While the co-management model is proposed in WCCBMPA's 2018 Updated management plan, implementation remains partial, and community participation is inconsistent.⁶⁴ The plan suggest that the area should be extended to include Mt. Hartman Bay and other agencies with statutory responsibilities for other areas of coastal, marine and land management be included in the arrangement. The plan argues that co-management and sharing of statutory obligations towards a common objective is being practiced in other areas of Grenada. In conclusion, the Woburn Clarke Court Bay Marine Protected Area encapsulates the complexities of modern marine governance, where ecological sustainability must coexist with economic development and social equity. The interplay of diverse stakeholders—spanning community members, civil society, private enterprises, public institutions, and academic entities—highlights both the challenges and opportunities inherent in managing shared marine resources. As Grenada continues to navigate its commitments to international conservation frameworks and national priorities, the WCCBMPA serves as a dynamic example of how inclusive, data-driven, and adaptive strategies can foster resilience in coastal ecosystems while empowering communities and supporting sustainable livelihoods.

⁶⁴ Finlay, Marine Protected Areas and Community Engagement, 7.

3. Legal Framework

3.1. International Conventions

In addition to its national legislative framework, Grenada has demonstrated its commitment to sustainable marine management by ratifying several international conventions and agreements. These include the Convention on Biological Diversity (CBD), the Ramsar Convention on Wetlands, and the Paris Agreement on climate change. By aligning its policies with these global frameworks, Grenada underscores the importance of nature-based solutions (NbS) and marine protected areas (MPAs) as critical strategies for biodiversity conservation, climate resilience, and disaster risk management. These conventions not only guide the country's efforts to safeguard its marine ecosystems but also provide a platform for collaboration and funding opportunities to strengthen local initiatives like the Woburn Clarke's Court Bay MPA.

An assessment of these international conventions and their assessment against the criteria of NbS, DRR and CCA yielded the following results:

Table 3: International Conventions related to NbS in Grenada

Convention	Mandate	Main Tools / Mechanisms/ Laws	Support for Nature-Based Solutions (NbS)	Related National Laws and Policies
Convention on Biological Diversity (CBD) party since August 11, 1994	Conserve biodiversity, ensure sustainable use, and share genetic resource benefits equitably	Environment and Biodiversity Coordination Act (2008) Territorial Waters and Marine Boundaries Act (1989) Beach Protection Act (1979) Fisheries Act (1986) National Parks and Protected Areas Act (1990) National Biodiversity Strategy (NBSAP) (2020) Nagoya Protocol, Cartagena Protocol	Strong support: Directly aligns with NbS goals—conservation, sustainable use, and equitable benefit sharing. The post-2020 Global Biodiversity Framework explicitly promotes ecosystem-based approaches	
CITES (Convention on International	Regulate trade in endangered species to avoid	Appendices I–III, trade permits	Indirect support: Focuses on species protection through	

Trade in Endangered Species) party since November 28, 1999.	threats to their survival		trade regulation. Helps preserve key species but does not frame this as NbS.	
Ramsar Convention on Wetlands, party since September 22, 2012	Promote conservation and wise use of wetlands	Integrated Coastal Zone Management Act (2019) Forest, Soil and Water Conservation Act (1949, amended 1984) Pesticide Control Act (1983) Ramsar Site designation, National Wetland Policies	High support: Wetland conservation and wise use are core NbS (e.g., mangroves for storm protection, peatlands for carbon storage).	September 22, 2012
United Nations Framework Convention on Climate Change (UNFCCC), April 6, 1994	Combat climate change through international cooperation	National Climate Change Policy (2017–2021) National Adaptation Plan (NAP) for Grenada, Carriacou & Petite Martinique (2019) Grenada's Comprehensive Disaster Management Act (2023) National Communications, NDCs, Kyoto Protocol, Paris Agreement	High support: Recognizes ecosystem-based mitigation and adaptation (e.g., REDD+ and ecosystem resilience). NbS referenced under the Paris Agreement.	
United Nations Convention to Combat Desertification (UNCCD) party since May 28, 1997	Prevent and reverse desertification and land degradation	Aligned National Action Programme (NAP) for the UNCCD (May 2015) Forest, Soil and Water Conservation Act (Cap. 116, 1949; amended 1967 & 1984) Physical Planning and Development Control Act (No. 25 of 2002)	Strong alignment: Supports land restoration, agroforestry, and sustainable land management—key NbS for dryland ecosystems.	

		National National Action Programmes (NAPs), Land Degradation Neutrality (LDN) Targets		
World Heritage Convention (UNESCO) party since August 13, 1998	Safeguard cultural and natural heritage	National Parks and Protected Areas Act (Act No. 42 of 1990) National Heritage Protection Act (Act No. 18 of 1990) Grenada National Museum Act (Act 2017) World Heritage Site listing, Operational Guidelines	Indirect support: Protects key ecosystems with NbS co-benefits (e.g., water regulation) but does not frame them as NbS.	
International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) party since October 2003	Facilitate access and benefit sharing of plant genetic resources for food security	Multilateral System (MLS), Standard Material Transfer Agreement	Moderate support: Promotes agrobiodiversity and resilient crop systems, aiding NbS in agriculture.	
Convention on the Conservation of Migratory Species of Wild Animals (CMS)	Protect migratory species across national boundaries	CMS Appendices, MoUs, Action Plans	Limited support: Species-focused. Indirect NbS benefits from maintaining ecosystem corridors.	

Grenada's participation in key international environmental conventions provides a robust framework for advancing NbS, particularly in the context of DRR and CCA. The CBD strongly supports ecosystem-based approaches and directly aligns with the conservation and sustainable use of marine and coastal ecosystems—critical for the resilience of Marine Protected Areas (MPAs). Similarly, the UNFCCC recognizes the role of coastal ecosystems like coral reefs and mangroves in mitigating climate impacts and reducing disaster risk, offering funding mechanisms for NbS through adaptation programming. The Ramsar Convention on Wetlands explicitly promotes the protection and wise use of wetlands, which in the Caribbean context includes coastal marshes and mangroves that act as buffers against storm surges and erosion. While conventions such as CITES, CMS, and the World Heritage Convention focus more on species or site-based protection, they offer indirect benefits to MPAs through enhanced

ecosystem integrity and habitat preservation. The UNCCD reinforces land-to-sea linkages by encouraging sustainable land use practices upstream that affect coastal sedimentation and marine health. Collectively, these conventions underscore the importance of integrating NbS into marine and coastal management in Grenada and call for scaling up MPA investments that deliver both biodiversity and climate resilience outcomes.

3.2. National Legislations

Grenada's national legislative architecture for coastal management resource governance is anchored in several inter-related acts and regulations—most notably the Fisheries Act, 1986 and its Fisheries Marine Protected Areas Regulations (SRO 78 of 2001), the Environmental Management Act, 2005, the National Parks and Protected Areas Act, 1991, and a suite of coastal-zone management instruments such as the Coastal Zone Management policies and legislations. Together, these laws establish the legal basis for designating and managing MPAs, regulating fishing activity, safeguarding biodiversity, and balancing conservation with sustainable livelihoods. In analysing their application to Woburn Clarke's Court Bay, this report considers how the provisions fulfil the criteria of NbS in DRR according to the IFRC Checklist and how the national legislation and policies intersect—and sometimes overlap—across agencies. It also identifies where enforcement mandates are duplicated or fragmented, and which critical gaps (e.g., shoreline setback enforcement, integrated monitoring, or climate-resilience standards) require targeted reform to ensure coherent, effective protection of the Bay's unique coastal and marine ecosystems and the potential for EbA interventions. The major policies and acts are assessed below. The policies are assessed according to the following IFRC checklist:

- Recognition of NbS in DRM and CCA Policies
- Prohibition on Causing Environmental Damage & Remediation Responsibilities
- Environmental Impact Assessments (EIAs) for Major Projects
- Restrictions on Exploitation of Key Ecosystems
- Land Use Laws and Development Restrictions in Sensitive Areas

3.2.1. Fisheries Act (Cap. 108) 1996

The Act acknowledges marine conservation through Marine Protected Areas (s. 23) but does not explicitly integrate NbS into DRR strategies as there are no provisions that mandate specific NbS projects for disaster resilience. No legal requirement exists to assess impacts on ecosystems that mitigate climate risks, such as coral reefs, mangroves, or coastal wetlands.

Section 25 prohibits destructive fishing practices (e.g., explosives, poisons) but does not explicitly extend to broader environmental degradation. The Act does not specify penalties for damaging critical ecosystems, such as mangroves, coral reefs, or seagrass beds, which are essential for NbS and there is no legal requirement for polluters or destructive actors to restore damaged marine ecosystems.

The Act does not mandate EIAs for fisheries-related infrastructure projects (e.g., fish processing plants, aquaculture farms, harbour developments). No legal requirement exists to assess impacts on ecosystems that mitigate climate risks, such as coral reefs, mangroves, or coastal wetlands.

Section 23 (Marine Protected Areas) helps conserve marine biodiversity, but it does not explicitly prevent ecosystem exploitation for DRM purposes. No restrictions on harvesting mangroves or extracting corals, which are key NbS features for coastal resilience. No sustainable use regulations that prioritize ecosystem integrity for disaster risk reduction.

The Act does not regulate land use or coastal development near fisheries zones as no protection mechanisms exist to restrict harmful infrastructure projects in sensitive marine environments. Aquaculture Leases (Sec. 22) do not mandate risk assessments for coastal ecosystems.

The Fisheries Act (Cap. 108) provides a basic framework for marine conservation, but it does not fully align with best practices in nature-based solutions (NbS) for DRM and climate resilience.

Strengthening the Fisheries Act (Cap. 108) to align with environmental laws and NbS criteria will enhance coastal resilience, disaster risk reduction, and long-term climate adaptation.

3.2.2. Fisheries (Marine Protected Areas) Order, SRO 77 of 2001; Fisheries (Marine Protected Areas) Regulations, SRO 78 of 2001

SRO 77 designates Woburn/Clarke's Court Bay and Molinière/Beauséjour as MPAs and allows planning for zones such as parks, reserves, sanctuaries, even "marine historical sites". Strictly prohibit destructive activities—extracting flora/fauna, coral removal, unpermitted anchoring—and set up special zones for recreation, research, protection.

Strong on NbS (via marine protection), indirectly supports DRR and CCA through habitat conservation. Emphasizes conservation, which supports ecosystem resilience, but no formal DRR planning. Supports ecosystem protection beneficial for CCA, but no explicit link to DRR/CCA strategies.

3.2.3. Grenada's Beach Protection Act, No. 67; CAP. 29 (1979) and its 2009 Amendment

The Act offers clear ecological protection of coastal ecosystems—important NbS elements—and imposes legal penalties against damaging activities. However, it does not explicitly link beach protection to disaster resilience or climate adaptation within the text. Lacks mandatory remediation for offenders, EIA provisions, and land-use planning controls to prevent harmful development.

3.2.4. Town and Country Planning Act CAP. 293 (1958) and Amendments Act 3 (1963), CAP. 339 (1990)

The Act's purpose is to regulate land use and development through planning permissions and zoning and does not reference disaster risk reduction, climate change adaptation, or nature-based solutions (e.g., living shorelines, bioswales). There is no mechanism to identify or require NbS projects within statutory development plans. The Act lacks any definitions or requirements around nature-based solutions, missing an opportunity to embed green infrastructure and ecosystem-based approaches into statutory development plans. While EIAs are implemented via regulations, explicitly requiring the Planning Act to reference ecosystem-service impacts (e.g., coastal protection, flood attenuation) would ensure DRR/CCA considerations are front and centre in development control.

3.2.5. Forest, Soil and Water Conservation Act Cap. 116 (1949) and the Amendment Ordinance No. 34 (1984)

The Act predates modern DRR and climate frameworks; it does not reference disaster risk, adaptation, or NbS terminology. The Act prohibits unauthorized felling, cultivation, and degradation of protected forest and watershed areas. However, it lacks provisions for mandatory remediation of environmental damage or penalties tied to broader ecosystem services or climate risks. While the Act restricts land use in protected areas, it is not structured as a land-use planning law. It does not explicitly link controls to disaster risk or climate vulnerability instead focusing on erosion prevention and water conservation.

3.2.6. National Parks and Protected Areas Act (Cap. 206)

Section 3: The Act establishes national parks and protected areas for conservation but does not explicitly reference disaster risk reduction (DRR) or climate adaptation strategies. Section 5: National parks can be declared for preserving natural beauty, flora, and fauna, indirectly supporting NbS but lacking specific DRR or CCA considerations.

Section 6(1): Prohibits settlement and occupation of national parks, indirectly protecting ecosystems; and prevents sale or settlement of national park lands, protecting them from uncontrolled development.

Section 12: Allows public utility works in national parks but does not require an EIA before infrastructure development.

Section 12(3): Allows public utilities to continue development in national parks, which could threaten fragile coastal ecosystems.

Section 13: Allows the Governor-General to grant leases for visitor accommodations in national parks but does not include strict environmental impact mitigation conditions.

Section 13(2)(a): Allows regulations to preserve flora and fauna but does not explicitly restrict resource exploitation within protected areas.

Section 13(2)(b): Regulates hunting, shooting, and fishing, but does not mention restrictions on mangrove harvesting or coral extraction.

Section 13(2)(l): The Minister has the power to regulate development and construction within national parks, but there is no clear requirement for EIAs before approving projects.

Section 13(2)(l): Allows regulations for construction and building but does not set criteria for high-risk coastal areas.

Section 17: Establishes penalties for violating park regulations but does not specifically penalize environmental damage that increases disaster risk.

The National Parks and Protected Areas Act (Cap. 206) provides a strong foundation for environmental conservation, but it does not fully align with best practices for integrating NbS into disaster risk management and climate resilience.

3.2.7. Crown Lands Act (1896)

The Crown Lands Act, 1896 provides a basic framework for the ownership and management of public lands, but it does not align with modern environmental laws or best practices in NbS for climate resilience and DRR. The Crown Lands Act (1896) requires substantial modernization to reflect current environmental, climate adaptation, and disaster risk reduction best practices.

The Act does not explicitly recognize NbS as a strategy for disaster risk reduction or climate resilience as there is no mention of environmental conservation, reforestation, or coastal protection initiatives. Section 6 allows the Governor-General to make rules for land management but does not explicitly include prohibitions on environmental damage. No provisions exist requiring restoration or remediation of degraded Crown Lands. The Act does not require Environmental Impact Assessments (EIAs) before leasing or developing Crown Lands.

Section 4 allows the Governor-General to grant or lease Crown Lands without requiring any environmental considerations. Section 9 reserves all mines, minerals, and precious metals for the Crown, allowing extraction without environmental safeguards. The Act does not place restrictions on logging, mining, or other resource exploitation in areas that promote disaster resilience (e.g., forests, wetlands, and mangroves).

Section 4 allows the sale, lease, or grant of Crown Lands without restrictions on environmental or climate-sensitive land use. Section 6 gives the Governor-General the power to prevent squatting and encroachment but does not restrict development in high-risk areas.

3.2.8. Grand Etang Forest Reserve Act (1923)

The Act recognizes the importance of forest conservation for rainfall and water supply, indirectly supporting NbS principles. Section 3 states that all lands in the Grand Etang Forest Reserve shall be preserved for forest conservation, but it does not explicitly mention disaster risk reduction or climate adaptation.

The Act recognizes the importance of forest conservation for rainfall and water supply, indirectly supporting NbS principles. The Act establishes permanent legal protection for the forest reserve but does not include specific penalties for environmental damage. No provisions exist requiring individuals or corporations to restore degraded forest lands.

The Act does not require Environmental Impact Assessments (EIAs) before any changes to land use or infrastructure projects in the reserve. There is no clear requirement for risk assessments when implementing public works or conservation projects in the area. The Act permanently designates the Grand Etang Forest as a protected area, which effectively prohibits unsustainable land use and deforestation. However, the Act does not specify regulations on permitted activities within the reserve, such as scientific research, sustainable tourism, or controlled resource extraction.

Section 3 ensures that the forest reserve is strictly preserved for conservation, meaning land use changes and development are not permitted. However, there is no mention of buffer zones or protections for adjacent lands that may also be ecologically sensitive.

3.2.9. Wild Animals and Birds Ordinance (1963)

The Ordinance establishes Grand Etang Forest Reserve as a sanctuary for wild animals and birds. Section 3 protects wildlife in the Grand Etang Forest Reserve, indirectly contributing to NbS for ecosystem stability and biodiversity conservation. However, the Ordinance does not explicitly recognize NbS as a strategy for disaster resilience or climate adaptation.

Section 4 effectively prohibits hunting and trapping in the Grand Etang Forest Reserve and also makes it an offense to kill, wound, trap, or take wild animals or birds allowing for the protection of critical wildlife habitats. The Ordinance designates the Grand Etang Forest Reserve as a sanctuary, protecting it from direct hunting and poaching. However, it does not include land use regulations that prevent deforestation, agricultural expansion, or infrastructure development.

Section 7 establishes penalties for violating the law, including fines and imprisonment. However, the Ordinance does not require environmental remediation by those who cause damage to wildlife habitats and does not mandate EIAs before allowing development in or near wildlife reserves.

Section 6 allows the Governor in Council to authorize activities that may impact protected areas, but there is no requirement for an environmental risk assessment before granting permissions and also

allows the Governor in Council to authorize hunting for scientific purposes. However, it does not impose strict conditions or sustainability limits as there is no specific restriction on other activities, such as logging, mining, or land conversion that may impact protected areas.

The Wild Animals and Birds Ordinance plays a crucial role in protecting wildlife and biodiversity, but it needs modern amendments to:

- Strengthen climate adaptation and disaster resilience policies
- Ensure strict environmental accountability for any land use changes
- Regulate sustainable activities while maintaining conservation goals

3.2.10. National Trust Act (Cap. 207) 1967

The Act establishes the Grenada National Trust as a corporate body responsible for the preservation of historic and natural sites. Section 5 allows the Trust to acquire and protect lands and marine areas for public benefit, indirectly supporting NbS. Sections 2(f) and (g) highlight the preservation of places of natural beauty and marine areas, but there is no explicit mention of NbS or its role in DRR and CCA.

Section 5 makes certain lands and marine areas inalienable, ensuring long-term protection. However, the Act does not impose penalties for environmental damage within National Trust-protected areas. No provisions require corporations or individuals to restore damaged sites. The Act does not require Environmental Impact Assessments (EIAs) before granting permission for activities on protected lands. There is no mention of risk assessments for development in marine or terrestrial protected areas.

Section 5 also protects lands, marine areas, and natural sites under the Trust's control, ensuring their permanent conservation. However, the Act does not explicitly restrict resource extraction (e.g., logging, mining, or coral reef harvesting) within protected areas. Section 5 also prevents the sale of National Trust lands, indirectly limiting large-scale development. However, the Act does not regulate land use around Trust-protected areas, leaving adjacent lands vulnerable to harmful development.

3.2.11. Integrated Coastal Zone Management Act (2019)

The Integrated Coastal Zone Management Act (2019) provides a solid foundation for coastal conservation, but it does not fully integrate NbS for DRR and climate adaptation. Section 4 mandates the development of a Coastal Zone Management Plan, which includes strategies and policies for managing coastal resources. Section 4(b) establishes standards for EIAs in coastal zone development. However, it does not mandate that all major infrastructure projects undergo an EIA before approval.

Section 10 allows for the designation of Coastal Zone Management Areas, indirectly promoting NbS. However, the Act does not explicitly refer to NbS as a core strategy for climate adaptation and disaster risk reduction and it does not prohibit high-risk developments in vulnerable areas.

Section 12 allows the designation of restricted areas to protect biodiversity and natural landscapes.

Section 22 outlines penalties for damaging regulated coastal resources. However, the Act does not require direct restoration of damaged ecosystems by offenders. Section 19 prohibits the harvesting of regulated coastal resources without a permit.

Section 23 restricts removal of vegetation and sand from beaches. However, there are no clear limits on the number of permits issued for activities like dredging, coral harvesting, or sand mining.

Section 5 includes provisions for public consultation before approving coastal developments but does not require risk assessments for all projects.

3.2.12. Physical Planning and Development Control Act (2016)

The Physical Planning and Development Control Act (2016): Section 3 states that the Act aims to ensure the sustainable use of land while considering environmental factors. Part VI (Protection of the Natural and Cultural Heritage) recognizes the importance of natural areas and establishes measures to protect them. However, the Act does not explicitly mention NbS as a climate resilience or disaster risk reduction strategy.

Part V (Enforcement of Development Control) allows the Planning and Development Authority to issue stop notices and enforcement orders for unauthorized development.

Section 45 (Protection of Natural Areas) provides for the protection of natural areas but does not specify penalties for environmental damage and also provides for the designation of protected areas, restricting harmful development.

Section 47 grants the Minister power to issue Ministerial Orders to protect the environment, but remediation is not a legal requirement.

Section 22 mandates EIAs for certain developments, as listed in Schedule III. The Act allows the Planning and Development Authority to determine whether an EIA is necessary. However, not all large-scale projects require EIAs, and cumulative environmental impacts are not always assessed.

Part VI (Heritage Conservation Areas) supports the conservation of ecologically and culturally significant sites. However, the Act does not explicitly regulate resource extraction (e.g., logging, mining) within these areas.

Section 30 allows for the declaration of zoned areas, restricting development in environmentally sensitive locations.

Section 38 establishes a Natural and Cultural Heritage Advisory Committee to oversee conservation planning. However, the Act does not provide detailed criteria for zoning decisions to ensure climate resilience.

3.2.13. Coastal Zone Management Policy (2019)

The 2016 Coastal Zone Management Policy and the 2019 ICZM Act both identify coastal ecosystems—mangroves, wetlands, coral reefs—as natural buffers that attenuate storm surge, prevent erosion, and build resilience to sea-level rise. The Policy calls for mangrove restoration pilots, shoreline revegetation, and coral-garden nurseries as defined Coastal Zone Management Plan actions; the ICZM Act mandates preparation of a Plan with standards for these ecosystem-based interventions. Both instruments empower designation of “prohibited areas” (no-take) and “restricted areas” (controlled use) for coastal resources, including corals, seagrasses, and mangroves, with penalties for unauthorized extraction. The ICZM Act requires that permits for sustainable uses (e.g., artisanal shellfish gathering, limited sand removal) carry conditions—such as seasonal closures and catch quotas—designed to maintain ecosystem function.

The ICZM Act explicitly incorporates EIA requirements into its enabling framework: any new coastal development, dredging, or reclamation must undergo an EIA that addresses impacts on “coastal resources”. Draft Plan guidance (ICZM Act 4) stipulates inclusion of an “ecosystem services impact” chapter—evaluating effects on storm-buffering capacity, shoreline stability, and habitat connectivity—and prescribing compensatory restoration where impacts are unavoidable. The ICZM Act requires Cabinet-approved coastal-zone maps, dividing the shoreline into “prohibited,” “restricted,” and “managed” zones, with specified setback distances (e.g., 50–100 m) to prevent construction in high-risk areas.

Both Policy and Act ban dredging, land reclamation, and hard coastal defences (e.g., seawalls) in designated high-sensitivity zones, steering development toward lower-risk areas and promoting soft-engineering NbS alternatives.

Grenada’s Coastal Zone Management Policy (2016) together with the 2019 ICZM Act robustly embed Nature-Based Solutions into disaster-risk and climate-adaptation frameworks. They couple explicit ecosystem-buffer recognition, concrete restoration pilots, strict zoning and permitting regimes, mandatory EIAs with ecosystem-service assessments, and enforceable land-use restrictions—fully aligning with contemporary best-practice criteria for NbS and DRM.

3.2.14. Grenada Maritime Economy Plan (March 2021)

The plan emphasizes sustainable management of marine resources and acknowledges the role of healthy ecosystems in supporting economic growth and resilience. However, it does not explicitly reference Nature-based Solutions (NbS) for disaster risk reduction (DRR) and climate change

adaptation (CCA). While the plan outlines strategies for sustainable marine resource management, it does not specify particular NbS projects aimed at reducing climate and disaster risks. The plan underscores the need for environmental protection but does not detail specific environmental laws that prohibit environmental damage or mandate remediation by individuals or corporations.

The plan does not explicitly mention the requirement for EIAs for major new construction or development projects, nor does it address the assessment of potential impacts on ecosystems that contribute to DRR and CCA. While the plan advocates for sustainable use of marine resources, it does not detail laws or regulations that prohibit or heavily restrict the exploitation of ecosystems vital for DRR and CCA. The plan does not address land use laws or plans that prohibit or strictly control development in areas containing ecosystems crucial for DRR and CCA.

The Grenada Maritime Economy Plan focuses on sustainable economic development within the maritime sector but lacks explicit integration of nature-based solutions and specific environmental regulatory frameworks related to disaster risk reduction and climate change adaptation.

3.2.15. National Climate Change Policy for Grenada, Carriacou, and Petite Martinique (2017-2021)

The policy acknowledges ecosystem-based adaptation (EbA) as a key strategy for climate change mitigation and adaptation. The integration of climate resilience in land and coastal management is emphasized. The policy recognizes the importance of coastal zones, marine ecosystems, and watersheds in mitigating climate risks and also recognizes that climate change exacerbates environmental damage and calls for stronger environmental protection measures. The need for enforcement of environmental regulations is highlighted, but no specific penalties for ecosystem degradation are detailed.

The policy requires that climate risk considerations be integrated into development planning as EIA requirements are mentioned but not detailed in terms of their application to NbS or DRM-focused projects. The policy supports stronger conservation of marine and coastal ecosystems, which play a key role in climate adaptation. Sand mining, mangrove harvesting, and coral reef degradation are recognized as threats to climate resilience. However, specific resource use restrictions are not detailed in the policy.

The policy supports integrating climate resilience into national land use planning. Climate-smart infrastructure development is promoted, but land use restrictions for high-risk areas are not explicitly detailed. Coastal and marine ecosystem conservation efforts are highlighted but require stronger legal enforcement mechanisms.

3.2.16. Grenada Building Codes and Standards (2000)

The Code's engineering-centric focus omits nature-based approaches (e.g., living shorelines, bioswales) that could complement hard-engineering measures. The 2000 Code focuses on structural resilience (wind loads, seismic design) but contains no reference to green infrastructure, ecosystem-based buffers, or other NbS approaches.

While site-clearance provisions require removal of vegetation and control of erosion during construction, there is no explicit prohibition on harming adjacent ecosystems nor a duty to remediate beyond stabilizing the construction footprint as the Code itself does not mandate any form of Environmental Impact Assessment; oversight of environmental effects remains the remit of separate legislation (e.g. the EIA Regulations under the Physical Planning Act).

Building standards regulate materials and structural systems but do not prohibit or limit extraction of natural resources (e.g., mangrove wood, coral aggregate) from hazard-buffering ecosystems. The Code includes minimum setbacks from the high-water mark and slope-stability criteria, which offer some protection of coastal and hillside ecosystems—but these are primarily for structural safety, not ecosystem conservation or NbS enhancement.

3.2.17. Grenada National Biodiversity Strategy and Action Plan (NBSAP) 2016-2020

The NBSAP recognizes the importance of ecosystem restoration and biodiversity conservation for national resilience. There is mention of forest rehabilitation and watershed management, particularly after the devastation caused by hurricanes and the document aligns with international frameworks, such as the Aichi Targets and Convention on Biological Diversity, but lacks an explicit mention of NbS terminology.

The NBSAP highlights the need for sustainable land management but does not clearly require EIAs for disaster risk-sensitive projects. There are general references to land-use policies, but EIA integration into DRM is not explicitly stated. The strategy does not explicitly link EIAs to NbS, coastal resilience, or watershed protection.

The NBSAP acknowledges overexploitation of marine and forest ecosystems but lacks specific regulatory measures for controlling extraction. Mangrove deforestation and coastal sand mining are noted as key threats, but enforcement remains a challenge. No clear sustainable extraction limits or penalties for overexploitation are defined. The NBSAP includes references to national land-use policies, but enforcement remains inconsistent. The physical planning framework is not fully integrated into biodiversity and DRM strategies.

The mangrove restoration program and national park protection measures are positive steps, but urban expansion and tourism development remain unchecked.

3.2.18. Grenada Tropical Forestry Action Plan (TFAP) 1985

The 1985 TFAP focuses on general forest management, reforestation and soil conservation, but does *not* frame these activities as nature-based solutions for disaster risk reduction or climate adaptation (the NbS concept post-dates the plan). While the TFAP includes pilot reforestation sites (e.g., watershed rehabilitation in the Grand Etang area), it does not tie them explicitly to reducing flood risk, landslides or other hazards.

The TFAP recommends stricter control of timber harvesting zones but stops short of formal prohibitions or clear permit limits tied to ecological thresholds. Harvesting quotas are discussed, but no binding ecological-limit framework (e.g., maximum allowable cut tied to watershed health) is established.

The 1985 TFAP does not include an Environmental Impact Assessment process. EIAs only became statutory in Grenada with the Physical Planning & Development Control Act (2002). No guidance on screening forestry or infrastructure activities for their impacts on ecosystem services relevant to disaster resilience. The TFAP maps priority conservation zones (e.g., upper watershed forests) but does not establish legal land-use restrictions or a permit regime to prevent deforestation or construction in flood-prone or erosion-sensitive areas. Recommendations include promoting agroforestry buffer strips along gullies, but no binding land-use controls or enforcement provisions are detailed.

The 1985 TFAP laid important groundwork in mapping Grenada's forest resources, recommending reforestation and soil-conservation pilots. However, it predates formal NbS terminology and lacks binding legal or procedural frameworks (EIAs, strict land-use controls, ecological permit limits) that today would be considered essential for integrating forestry management into DRM and climate-adaptation policy.

3.2.19. National Forest Policy (1999) and Strategy (2000)

The Policy emphasizes watershed protection, soil conservation, and agroforestry—measures that inherently contribute to flood attenuation and slope stabilization. However, it does not explicitly brand these as “nature-based solutions” nor set out concrete NbS projects. The Strategy urges integration of forest-zone maps into land-use planning and establishment of no-disturbance buffers along streams. But there is no requirement for standardized hazard-mapping (flood or landslide), or statutory setback distances tied to DRR outcomes.

Neither the 1999 Forest Policy nor the 2000 Strategy frame forest management activities as “Nature-Based Solutions” for disaster risk reduction or climate adaptation—NbS terminology post-dates these documents. The Policy delineates “production forest” versus “protected forest” zones with harvesting guidelines, but these are geared toward sustainable yield rather than safeguarding DRM-critical

ecosystem services. The Strategy recommends allowable cut volumes per management unit, yet it lacks binding thresholds tied to watershed health metrics or slope stability criteria.

Both documents pre-date Grenada's EIA legislation (Physical Planning & Development Control Act, 2002) and contain no provision requiring impact assessments for plantation establishment, logging roads, or related infrastructure. There is no guidance on screening forestry operations for potential negative effects on ecosystem functions that contribute to disaster resilience.

The Policy establishes "protection forests" along steep slopes and headwater catchments, recommending development setbacks—but without legal force or explicit permit controls to prevent encroachment. The Strategy calls for a national forest zoning plan and integrated land-use maps to guide where agroforestry and settlement should occur, which—if implemented—would curb unmanaged expansion, though enforcement mechanisms are not detailed.

The 1999 Policy and 2000 Strategy lay a solid foundation for sustainable forest management—differentiating production and protection zones and promoting reforestation and agroforestry. However, they do not explicitly adopt NbS language, lack mandatory EIA or DRM-focused impact screening, and stop short of legislating strict land-use controls in hazard-prone areas. Upgrading these frameworks with clear links to disaster risk reduction, binding ecological thresholds, and statutory land-use restrictions would be necessary to meet today's NbS and DRM standards.

3.2.20. Land and Marine Management Strategy (2011)

The Strategy promotes integrated coastal zone management, mangrove and coral-reef conservation, and upland watershed protection—all ecosystem-based measures that reduce flood and erosion risk. However, it does not explicitly label them as "nature-based solutions" nor set out clear project pipelines. The Strategy frames coastal ecosystems (mangroves, wetlands, coral reefs) as natural buffers against storm surge, erosion, and sea-level rise, explicitly recommending their restoration and conservation as key disaster-risk-reduction measures. It lays out pilot actions—including mangrove replanting in Levera and Grand Anse wetlands, coral-gardening nurseries, and shoreline reforestation plots—tying each to measurable risk-reduction goals (e.g., attenuation of wave energy, stabilization of soft shorelines).

The Strategy designates strict "no-take" zones within critical mangrove and wetland tracts, and "sustainable-use" zones elsewhere, with harvesting of timber, shellfish, and sand subject to annual quotas and seasonal closures. Permit conditions for approved uses (e.g., artisanal shellfish gathering) include ecological thresholds—such as a maximum biomass removal limit and mandatory restoration contributions—to safeguard habitat function.

The document mandates that any new land-reclamation, marina development, or major coastal infrastructure project conduct an EIA with a dedicated "ecosystem services impact" chapter, assessing

potential loss of NbS values and prescribing compensatory restoration where impacts are unavoidable. It specifies that EIA scoping must engage local communities and utilize sea-level-rise and storm-surge modeling to inform siting and design of works.

The Strategy introduces a coastal-zone spatial plan dividing the shoreline into High-Sensitivity (no development), Moderate-Sensitivity (restricted, set-back development), and Low-Sensitivity (managed development) categories. It prohibits urban expansion, quarrying, and road construction within High-Sensitivity bands—defined by elevation and proximity to key NbS habitats—and sets minimum buffer widths (50–100 m) to maintain ecosystem integrity.

3.2.21. National Environmental Policy and Management Strategy (2005)

The Policy articulates a commitment to “sound environmental management” and integration of environmental concerns into national development, but it does not explicitly frame activities (e.g., ecosystem restoration) as Nature-Based Solutions for disaster risk reduction or climate adaptation. The document remains at a strategic level and does not enumerate concrete projects—such as mangrove replanting or watershed rehabilitation—tied to hazard-mitigation outcomes. The Policy calls for harmonizing sectoral legislation (e.g., forestry, fisheries, coastal management) to safeguard natural resources but does not itself establish prohibitions or quota systems for extraction in ecosystems that provide DRM services.

No binding thresholds or permit-condition requirements are set out in the Policy; detailed limits would need to be drawn from subsequent sector-specific laws. While the Policy does not contain EIA procedures itself, it endorses the use of Environmental Impact Assessments—as later codified in the Physical Planning and Development Control Act (2002)—to ensure projects consider environmental and resilience impacts. The Policy calls for “integrated environmental review” but lacks detail on requiring assessments of impacts on ecosystem services relevant to disaster resilience; such specificity appears in later sectoral regulations.

The Strategy promotes preparation of a National Land-Use Policy and spatial plans that identify sensitive areas (e.g., coastal zones, watersheds), yet as a policy framework it does not itself impose legal development bans—those arise under the Physical Planning Act and sector laws. The Policy emphasizes integrating environmental considerations into sectoral plans (agriculture, tourism, forestry) but does not include enforceable setback requirements or land-use zoning; such measures depend on implementing regulations.

Grenada's 2005 National Environmental Policy and Management Strategy provides a strong **strategic** foundation for integrating environmental and resilience objectives into national development. However, it does **not** explicitly adopt NbS terminology or outline specific hazard-reduction projects; instead, it relies on **subsequent sectoral legislation** (e.g., Physical Planning Act, Coastal Zone

Management Act) to operationalize EIAs, land-use controls, and extraction limits that align with modern NbS and DRM standards.

3.3. Assessment of the Comprehensive Disaster Management Act (No. 2 of 2023)

Table 4 Assessment of the Comprehensive Disaster Management Act

Checklist Area	Assessment Summary	Gaps or Deficiencies	Reference from the Act
Lead Responsibility for DRR	The Act establishes a central agency responsible for all phases of DRR and outlines roles across national and local levels.	Overlap between national and local authorities may create confusion; some responsibilities remain vague.	Part II, Section 5–8
Roles and Responsibilities of Other Actors	The Act defines roles for civil society, private sector, and community groups in DRR planning and execution.	No detailed operational mandates or coordination strategies between non-state actors.	Part III, Section 12–14
Local Governments and Affected Communities	Local Disaster Committees are mandated; the law encourages community participation and planning.	Insufficient funding and unclear guidance for local community-led DRR initiatives.	Part IV, Section 19–21
Coordination Mechanisms	The Act provides for national and subnational coordination platforms and periodic inter-agency meetings.	Does not include coordination during transition phases (response to recovery).	Part V, Section 23–25
Funding	A national disaster fund is established with disbursement guidelines and contingency financing.	No dedicated fund for anticipatory action or multi-year recovery investments.	Part VI, Section 27–30

Monitoring and Evaluation	The Act mandates periodic review and public reporting after major disasters.	Monitoring system lacks a feedback mechanism involving community stakeholders.	Part VII, Section 31–33
Coherence between DRR and CCA	References to climate adaptation exist and the Act seeks alignment with national adaptation plans.	No joint implementation strategies or shared indicators between DRR and CCA bodies.	Part VIII, Section 34
Planning Prevention and Mitigation Measures	The law mandates national and sectoral disaster prevention plans using risk assessments.	Sectoral plans are not clearly harmonized and lack enforcement mechanisms.	Part IX, Section 36–38

3.4. Assessment of the Assessment of the Woburn Clarkes Court Bay MPA Management Plan (2018) Against NbS-&-DRM and Land-Use Criteria

The Plan is framed explicitly as “Community-Led Ecosystems-Based Adaptation to Climate Change,” signalling an intentional use of natural systems (mangroves, seagrass, coral reefs) to reduce hazards like storm surge and erosion. While the Plan includes detailed scientific monitoring and research (e.g., water-quality baselines, benthic habitat surveys) and pilot awareness/education on ecosystem services, it does not enumerate concrete restoration or rehabilitation projects (e.g., mangrove replanting, shoreline revegetation) tied to specific disaster-risk reductions.

The Plan designates Eco-Reserve (no-take) zones, Dual-Use Fishing Zones with seasonal restrictions, and Fishing Exclusion Zones in heavily polluted estuarine areas, thereby strictly regulating extraction where ecosystem services support resilience. Permit conditions and quotas are implied through zoning categories, but the document does not specify binding ecological thresholds (e.g., maximum allowable biomass removal) or permit-specific impact caps.

The Management Plan references the Physical Planning and Development Control Act (No. 23 of 2016) in its policy framework but does not itself include a requirement for EIAs or detail an EIA process assessing impacts on ecosystem functions vital for DRM/CCA. There is no guidance within the Plan for scoping or assessing how proposed management actions or infrastructure might affect the natural buffers (mangroves, reefs) that underpin disaster resilience.

Through Coastal Exclusion Zones (extending ~100 m offshore) and clear setbacks within its zoning scheme, the Plan prohibits anchoring and development in areas critical for ecosystem stability and

public safety. By mapping and enforcing distinct Navigation Channels, Mooring Fields, and Swimming/Snorkelling Zones, the Plan prevents haphazard expansion—such as unregulated yacht anchorage—that could degrade shoreline and benthic habitats.

The 2018 Management Plan strongly embeds Ecosystems-Based Adaptation through its title, objectives, and zoning design—recognizing coastal ecosystems as vital buffers. It establishes robust land-use restrictions and no-take/reserve zones to regulate extraction. However, it stops short of prescribing specific restoration projects under an NbS framework, lacks an explicit EIA requirement with ecosystem-service assessments, and does not set quantitative ecological limits on permitted uses. To fully meet contemporary NbS and DRM best practices, the Plan would benefit from:

1. Articulated restoration pilots (e.g., mangrove replanting linked to wave-attenuation goals).
2. Incorporation of mandatory EIA protocols assessing impacts on natural buffers.
3. Binding ecological thresholds within permit conditions.

This enhancement would ensure the Plan not only manages competing uses but also actively leverages and sustains ecosystem functions for disaster-risk reduction and climate adaptation.

3.5. Overall Conclusion

Across this suite of policies and statutes, a clear pattern emerges: Grenada’s legal framework recognizes the value of healthy ecosystems—through protected areas, coastal buffers, and watershed conservation—but stops short of systematically embedding those natural functions into formal disaster-risk reduction or climate-adaptation strategies. While many Acts (e.g., Fisheries, Beach Protection, National Parks, Integrated Coastal Zone Management) establish prohibitions on habitat destruction and sanction polluters, they rarely: define “nature-based solutions” or hazard-buffer zones; trigger EIAs expressly to evaluate impacts on flood-attenuating or storm-surge-buffering ecosystems; impose binding remediation and monitoring duties; or mandate quantitative extraction limits and enforceable setbacks in high-risk areas. To close these gaps, the overarching recommendation is to harmonize and strengthen the entire legislative suite by introducing common NbS definitions, explicit EIA triggers for developments in mapped hazard-buffer zones, statutory restoration obligations for any ecosystem damage, enforceable quotas or moratoria on critical resource extraction, and integrated hazard-map overlays in all land-use and coastal planning instruments. Together, these reforms would transform piecemeal conservation measures into a cohesive, resilience-building framework that leverages Grenada’s natural capital to reduce disaster risk and adapt to a changing climate. Specific recommendations for the majority of the policies can be found in Appendix 2.

4. Ecosystem-based Adaptation for Mangrove Rehabilitation in the WCCBMPA: Benefits, Opportunities and Barriers

4.1. Potential Benefits of Ecosystem-based Adaptation in the WCCBMPA

Mangrove restoration in the WCCBMPA offers a range of ecological, socio-economic, and climate resilience benefits. Ecologically, mangroves function as biodiversity hotspots and essential breeding grounds for commercially important fish and shellfish species. Their dense root systems reduce shoreline erosion, trap sediments, and improve water quality, enhancing the ecological integrity of the wider marine protected area.⁶⁵

From a climate adaptation perspective, mangroves serve as natural buffers, reducing the impact of storm surges, coastal flooding, and sea-level rise. This is particularly critical for Grenada's vulnerable coastal communities, such as those in Woburn and Clarke's Court Bay, which are frequently exposed to extreme weather events. Studies show that well-maintained mangrove belts can reduce wave heights by up to 66% over 100 meters,⁶⁶ thereby significantly lowering disaster risk.

Socioeconomically, mangrove rehabilitation supports sustainable livelihoods through fisheries enhancement, ecotourism, and the potential for blue carbon credits. Additionally, healthy mangrove ecosystems provide cultural and recreational value to local communities and strengthen food and economic security.^{67 68}

4.2. Barriers to Ecosystem-based Adaptation Implementation

Despite the considerable promise of ecosystem-based adaptation (EbA) to rehabilitate mangroves in the Woburn Clarke's Court Bay Marine Protected Area (WCCBMPA), several interrelated barriers may constrain the success and scalability of such interventions:

⁶⁵ Alongi, D. M. (2012). *Carbon sequestration in mangrove forests*. Carbon Management, 3(3), 313–322. <https://doi.org/10.4155/cmt.12.20>

⁶⁶ Narayan, S., Beck, M. W., Wilson, P., Thomas, C. J., Guerrero, A., Shepard, C. C., Reguero, B. G., Franco, G., Ingram, J. C., & Trespalacios, D. (2016). *The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-Based Defences*. PLOS ONE, 11(5), e0154735. <https://doi.org/10.1371/journal.pone.0154735>

⁶⁷ UNEP. (2014). *The Importance of Mangroves to People: A Call to Action*. United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). Retrieved from <https://www.unep.org/resources/report/importance-mangroves-people>

⁶⁸ See Appendix 3 on Grenada's Blue Economy Programme

4.2.1. Land Tenure Uncertainty

Ambiguities surrounding land ownership and customary use rights in coastal and nearshore zones present a significant barrier. In many cases, coastal lands are informally used or overlap with private leases and tourism concessions, complicating access for restoration. Where legal frameworks are underdeveloped or poorly enforced, EbA efforts can face delays, disputes, or resistance from landowners and investors. Transparent land governance and inclusive tenure mapping are thus essential precursors for effective EbA planning.

4.2.2. Limited and Fragmented Funding

Although EbA approaches are widely acknowledged as cost-effective over the long term, they often require substantial upfront investment in planning, capacity-building, community engagement, and ecological restoration. Funding for such preparatory and adaptive phases is frequently fragmented or short-term. Moreover, many donor mechanisms still prioritize hard infrastructure over ecosystem-based solutions, limiting accessible financing. Innovative blended finance models and alignment with climate adaptation funds are urgently needed to bridge this gap.

4.2.3. Knowledge and Data Gaps

Effective mangrove rehabilitation depends on detailed ecological baselines and hydrological understanding. However, historical data on mangrove cover, degradation patterns, and sediment dynamics in the WCCBMPA are limited or inconsistent. Without this information, there is a risk of poorly sited or technically ineffective restoration projects. Investment in local scientific research, community-based monitoring, and partnerships with universities (e.g., SGU) is crucial to close these data gaps.

4.2.4. Development Pressures and Competing Land Uses

Coastal development, including marina construction, land reclamation, and tourism infrastructure, continues to exert pressure on mangrove habitats. These activities often proceed without adequate environmental safeguards or enforcement of existing zoning regulations. In the absence of robust environmental impact assessments (EIAs) and integrated coastal planning, EbA measures may be undermined or reversed. Coordinated spatial planning and regulatory reform are essential to secure restoration sites and prevent further degradation.

4.3.5. Climate Change Stressors

Mangrove ecosystems themselves are vulnerable to climate-related changes such as rising sea levels, saline intrusion, extreme weather events, and shifting precipitation regimes. If not carefully planned, restored mangroves may fail to establish or persist under future climate conditions. Adaptive restoration approaches, including species selection, hydrological modelling, and buffer zone creation, are necessary to build ecological resilience and ensure long-term success.

Rehabilitating mangroves in the WCCBMPA through a well-designed ecosystem-based adaptation strategy holds significant potential to reduce coastal disaster risk, support biodiversity, and strengthen community resilience. However, these benefits can only be realized if key barriers are systematically addressed. This includes resolving land tenure issues, mobilizing sustained financing, improving scientific knowledge, mitigating development conflicts, and integrating climate foresight into project design. A multisectoral and inclusive governance model will be vital to overcoming these challenges and ensuring that EbA becomes a cornerstone of Grenada's climate adaptation framework.

4.3. Opportunities for Ecosystem-based Adaptation in the WCCBMPA

Several enabling conditions exist for implementing a successful ecosystem-based adaptation (EbA) initiative to restore mangroves in the Woburn-Clarke's Court Bay Marine Protected Area (WCCBMPA):

4.3.1. Institutional Alignment

The WCCBMPA benefits from an established co-management framework involving the Fisheries Division, local community groups, and environmental NGOs. This arrangement fosters collaborative decision-making and enhances local ownership of marine and coastal resource management. Such multi-stakeholder governance mechanisms are essential for EbA interventions, which require long-term stewardship, ongoing monitoring, and adaptive management. The existing institutional collaboration can serve as an implementation backbone for EbA activities, ensuring alignment with national marine conservation priorities and legal mandates.

Moreover, the recent establishment of a dedicated Ministry of Blue Economy and Marine Affairs opens new horizons for embedding EbA and broader NbS into national policy. By centralizing oversight of fisheries, coastal tourism, marine spatial planning, and blue-carbon initiatives, the Ministry can coordinate cross-sectoral investments in living shorelines, mangrove restoration, and seagrass meadow rehabilitation. Its mandate to integrate economic development with marine conservation provides a strategic platform for securing budgetary allocations, forging public-private partnerships, and streamlining regulatory approvals for NbS projects. In practice, the Ministry's convening power and technical expertise will be critical to scaling pilot EbA interventions, mobilizing climate finance, and institutionalizing adaptive management protocols across all coastal zones of Grenada.

4.3.2. Policy Momentum

Grenada has demonstrated commitment to ecosystem-based and nature-based approaches through its National Adaptation Plan (NAP), the Grenada Coastal Zone Policy (2016), and the National Biodiversity Strategy and Action Plan (NBSAP). These instruments explicitly promote ecosystem services and coastal resilience as core elements of national climate adaptation and disaster risk reduction. Ongoing initiatives, such as the Climate-Smart Agriculture Programme and Marine Spatial Planning process, offer policy windows for mainstreaming EbA into broader development strategies. Additionally, regional commitments under the Caribbean Challenge Initiative and support from international frameworks (e.g., the UNFCCC and CBD) provide opportunities for resource mobilization and technical cooperation.

There is also strong policy focus on the Blue Economy in Grenada, underscored by its active participation in the regional Blue Economy Programme,⁶⁹ which explicitly integrates ecosystem-based adaptation principles.

Building on these efforts, Grenada's recent application to join the Coalition for Disaster Resilient Infrastructure (CDRI)⁷⁰ signals a pivotal opportunity to embed NbS in its infrastructure agenda. Through CDRI membership, Grenada can access global best practices and technical guidance to integrate nature-based features—such as vegetated swales, living shorelines, and urban green corridors—directly into the design of roads, bridges, ports, and coastal defences. This approach not only strengthens infrastructure against extreme weather and sea-level rise but also restores and enhances critical ecosystem services—like flood attenuation and shoreline stabilization—while unlocking access to resilience-focused finance and multi-stakeholder partnerships for sustainable development.

4.3.3. Community Engagement

Community interest and participation in coastal and marine conservation have grown steadily in the WCCBMPA area. Local fishers, residents, and schools have taken part in mangrove clean-ups, environmental education campaigns, and marine monitoring efforts. This active engagement reflects a growing environmental consciousness and provides a strong social foundation for EbA implementation. Engaging communities in planning, planting, and monitoring mangroves enhances

⁶⁹ See Appendix 3 on Grenada's Blue Economy Programme

⁷⁰ The Coalition for Disaster Resilient Infrastructure (CDRI) is an international partnership—launched at the 2019 UN Climate Action Summit—of national governments, UN agencies, multilateral development banks, the private sector, and knowledge institutions. Headquartered in New Delhi and supported by an interim secretariat at India's National Disaster Management Authority, CDRI's mission is to promote the resilience of new and existing infrastructure systems to climate and disaster risks through research, knowledge-sharing, standards development, and financing mechanisms. In early 2025, Grenada formally signaled its intent to join CDRI. At #ICDRI2025 (6–7 June) in Nice, Merina Jessamy, Permanent Secretary for Economic Development, Planning and Cooperatives, represented Grenada—underscoring the country's commitment to integrate disaster-resilience into its infrastructure planning and to leverage CDRI's technical and policy support.

the legitimacy and sustainability of the intervention, particularly when supported by livelihood co-benefits and inclusive training programs.

4.3.4. Research and Technical Support

The area's proximity to St. George's University and other regional research institutions offers a valuable source of technical capacity and scientific knowledge. These institutions can continue to provide support for ecological baseline assessments, spatial analysis, and the design of restoration models tailored to local hydrological and sediment conditions. Partnerships with academic actors can also contribute to participatory research, youth engagement, and the development of monitoring frameworks to track ecosystem recovery and climate resilience outcomes over time. Specifically, the universities and research institutions can focus on NbS initiatives and innovations.

4.3.5. Funding and Partnership Potential

There is growing international interest in funding nature-based solutions through climate finance mechanisms such as the Green Climate Fund (GCF), Global Environment Facility (GEF), and bilateral development agencies. The WCCBMPA's recognition as a biodiversity hotspot and climate-vulnerable zone strengthens its case for such funding. Public-private partnerships, including those involving the tourism sector, may also be leveraged to co-finance mangrove restoration and develop ecotourism-linked EbA co-benefits.

5. Policy Opportunities for NbS and EbA in WCCBMPA

To effectively advocate for and implement an EbA intervention for mangrove rehabilitation in the WCCBMPA, legal and policy reforms must strengthen institutional mandates, secure environmental safeguards, and create enabling frameworks for nature-based solutions. The following recommendations are proposed:

5.1.1. Clarify Coastal Land Tenure and Zoning Frameworks

- **Recommendation:** Strengthen and clarify the legal status of coastal lands and mangrove habitats by updating cadastral records and integrating EbA zones into the National Physical Development Plan.
- **Justification:** Secure land tenure is essential for long-term mangrove protection. Legal ambiguity undermines restoration investments and community stewardship.

5.1.2 Amend the Fisheries Act and Marine Protected Areas Regulations

- **Recommendation:** Revise relevant provisions under the Fisheries Act (1986) and Marine Protected Areas Regulations (2001) to explicitly include ecosystem-based adaptation and climate resilience as MPA management objectives.
- **Justification:** This would provide statutory backing for EbA and ensure alignment with Grenada's commitments under the CBD, UNFCCC, and the OECS Eastern Caribbean Regional Ocean Policy.

5.1.3 Adopt a National Ecosystem-based Adaptation Policy or Strategy

- **Recommendation:** Develop and adopt a national EbA policy or operational framework that integrates climate adaptation, biodiversity conservation, and disaster risk reduction, guided by the National Adaptation Plan (NAP). Grenada has also completed its National Ecosystem Assessment, so it has a foundation for the formulation of a strategy.
- **Justification:** A coherent policy signal would encourage investment, harmonize sectoral planning (e.g., tourism, fisheries, agriculture), and enable access to international climate finance.

5.1.1. Mainstream EbA into Environmental Impact Assessment (EIA) Regulations

- **Recommendation:** Mandate the assessment of nature-based alternatives and EbA measures in all EIAs for coastal development under the Physical Planning and Development Control Act (2002).
- **Justification:** This strengthens enforcement of “avoid, minimize, restore” principles and protects mangrove ecosystems from tourism and marina development pressures.

5.1.4 Establish Legal Mechanisms for Community Co-management and Stewardship

- **Recommendation:** Expand legal recognition for community-based organizations and fisherfolk groups as co-managers of EbA sites, building on the model used in the WCCBMPA co-management agreement. Inclusion of non-institutional and government stakeholders will truly enhance the co-management intent and achievements.
- **Justification:** Local engagement enhances enforcement, sustainability, and livelihood integration of EbA interventions.

5.1.5 Enable Blue Carbon and Ecosystem Service Valuation Instruments

- **Recommendation:** Introduce legal provisions for valuing ecosystem services, including blue carbon credits, through the development of a Natural Capital Accounting framework.
- **Justification:** These tools can incentivize mangrove restoration and help generate sustainable finance streams for maintenance and monitoring.

5.1.6 Leverage Regional Legal Instruments

- **Recommendation:** Align EbA-related reforms with regional instruments such as the OECS St. George's Declaration of Principles for Environmental Sustainability and the Caribbean Biological Corridor Initiative.
- **Justification:** Regional harmonization enhances donor support, knowledge sharing, and legal consistency across Caribbean SIDS.

6. Advocacy Strategy Recommendations for EbA Intervention in WCCBMPA

This section outlines key advocacy strategy recommendations to support the design and implementation of an Ecosystem-based Adaptation (EbA) intervention for mangrove restoration in the Woburn-Clarke's Court Bay Marine Protected Area (WCCBMPA). The strategy is designed to influence policy, mobilize resources, and engage communities and decision-makers to enable a successful and sustainable EbA initiative.

6.1.1. Position EbA as a Climate Risk Reduction and Livelihood Strategy

Reframe EbA from an environmental issue to a critical risk reduction and economic resilience strategy.

- Highlight the protective function of mangroves against storm surges and coastal erosion.
- Use local evidence (e.g., damage assessments from past hurricanes) to demonstrate cost savings compared to hard infrastructure.
- Showcase co-benefits for fisheries, tourism, and food security to appeal to economic ministries and local livelihoods.

6.1.1 Build a Coalition of Champions

Establish a diverse advocacy alliance including government agencies, fisherfolk, youth, women's groups, and NGOs.

- Engage the WCCBMPA co-management committee as a central coordination platform.
- Identify and empower local spokespersons who can speak to the benefits of mangrove restoration.
- Facilitate cross-sectoral policy dialogues that include ministries of climate resilience, tourism, fisheries, and finance and physical planning.

6.1.2 Leverage Legal and Policy Reform Windows

Align EbA advocacy with ongoing policy revisions and international commitments.

- Push for inclusion of EbA terminology/language in the National Adaptation Plan (NAP), Marine Spatial Plan, and Physical Planning legislation
- Advocate for formal recognition of EbA zones within MPA regulations and coastal zoning frameworks.
- Use Grenada's reporting obligations under the UNFCCC, CBD, and SDGs as entry points for national prioritization.

6.1.3 Mobilize Evidence and Local Knowledge

Equip advocates with compelling data and stories to influence decision-making.

- Prepare policy briefs and infographics summarizing scientific data (e.g., carbon sequestration, flood reduction metrics).
- Conduct participatory photo and video documentation of mangrove restoration to illustrate impacts.
- Use citizen science and community monitoring tools to validate restoration potential and track impact.

6.1.4 Engage Development Partners and Funders

Position the WCCBMPA EbA intervention as a flagship pilot for blue carbon and nature-based climate finance.

- Package the EbA concept into a fundable proposal aligned with donor priorities (e.g., GCF, GEF).
- Advocate for blended finance models including government budget lines, tourism levies, and private sector co-investment.

- Work with regional institutions to elevate the project within a broader resilience portfolio.

6.1.5 Strengthen Community Awareness and Participation

Build grassroots support and stewardship for the EbA intervention.

- Launch a public awareness campaign around 'Mangroves = Protection + Prosperity.'
- Co-develop restoration plans with communities and integrate traditional knowledge.
- Establish youth-led eco-restoration teams and environmental school clubs.

6.1.6 Monitor, Communicate, and Adapt

Ensure transparency, learning, and iterative refinement of advocacy efforts.

- Develop an M&E framework to track policy influence, community uptake, and ecosystem recovery.
- Host community feedback events to provide updates and reinforce accountability.
- Adjust messages and tactics based on feedback and changing conditions.

7 Appendices:

Appendix 1- Legal and Policy Assessment Tool

Checklist: Lead Responsibility for DRR	
The law creates a national agency or department which has a comprehensive mandate for DRR in relation to most (if not all) hazards	Yes/ No
The law clearly identifies which government authorities are responsible for DRR at provincial and local levels.	
Laws, policies and plans provide disaster authorities at all levels of government clear and comprehensive mandates, roles and responsibilities.	
The mandates, roles and responsibilities of disaster authorities collectively address: - o disaster prevention, mitigation, preparedness, anticipatory action, response and recovery; - o all types of hazards; - o all geographical areas in the country; and - o all types of function (e.g., policy, operations, monitoring, evaluation).	
If there is more than one DRR authority or department (e.g., at different levels of government; for different hazards; for different components of DRR), their respective mandates, roles and responsibilities are clear. There is no inconsistency, unnecessary duplication or confusion about mandates, roles and responsibilities.	
Checklist: Roles and Responsibilities of other Actors	
Disaster laws, policies and plans clearly outline the roles and responsibilities of all government and non-government actors in DRR including: - o different levels of government; - o sectoral departments and agencies; - o civil society organizations; - o the private sector; and - o community groups.	
Disaster laws, policies and plans recognize the auxiliary role of the National Society in DRR and clearly outline its roles and responsibilities.	
Disaster plans: - o provide clear and precise descriptions of each actors' roles and responsibilities; - o indicate which actors play lead and supporting roles for different activities; and	

○ specify how roles and responsibilities differ for different components of DRR (e.g., response vs recovery).	
The roles and responsibilities allocated to different actors are commensurate with their capacities and resources.	
Checklist: Local Governments and Affected Communities	
Laws and policies recognize the importance of a community-centred approach to DRR which integrates meaningful community participation into programs and activities.	
The law requires DRR actors to conduct ongoing community consultation on the design and implementation of DRR activities.	
The law provides for the establishment of DRR committees and/or coordination mechanisms at local government level, which include community representatives.	
There are mechanisms or programs in place for disaster authorities and local governments to provide a range of supports (e.g., financial, technical, legal) to community groups that wish to design and implement their own local DRR projects.	
Checklist: Coordination Mechanisms	
Laws, policies and plans: ○ establish a range of coordination mechanisms at different levels of government and for different components of DRR; ○ clearly specify which actors will lead and participate in each coordination mechanism; ○ provide for non-government actors that have DRR roles and responsibilities to participate in operational coordination mechanisms; ○ enable the government to include additional actors in coordination mechanisms on an ad hoc basis as needed (e.g., to respond to changing circumstances); and ○ specify if, how and when the leadership and participation in coordination mechanisms changes (e.g., when transitioning from response to recovery).	
There are coordination mechanisms for disaster prevention and mitigation, preparedness, anticipatory action, response, recovery and international assistance.	
Checklist: Funding	
There is a disaster funding strategy which combines a variety of funding mechanisms to address disasters of differing frequency and severity including some or all the following mechanisms: regular budget allocations; contingency budget lines; government disaster funds; multi-donor trust funds;	

contingent credit lines; traditional and parametric insurance; and catastrophe-linked securities.	
The disaster funding strategy reflects the risk layering and forecast-based financing approaches.	
The disaster funding strategy achieves an efficient balance between funding: (i) measures to reduce disaster impacts (i.e., prevention, mitigation, preparedness and anticipatory action); and (ii) measures to respond to and overcome disaster impacts (i.e., disaster response and recovery).	
The disaster funding strategy provides adequate funding for prevention and mitigation, preparedness, anticipatory action and long-term recovery through mechanisms such as: ◦ earmarking funds within the disaster fund for these components of DRR; and/or ◦ creating dedicated funds for these components of DRR.	
The disaster funding strategy includes funding mechanisms that provide regular payments or disbursements over a multi-year period after a disaster.	
The law mandates regular budget allocations for national, provincial and local disaster authorities. The law also establishes a contingency budget line which can be used for disaster response and recovery.	
The law establishes a disaster fund. The law clearly identifies: the sources of contributions to the fund; the criteria for disbursements; ◦ the maximum amount that may be disbursed per year and/or per event; ◦ the amount or proportion of funding that is earmarked for specific components of DRR; ◦ the administration and auditing of the fund; ◦ how the fund is invested (if at all); and ◦ the governance structure for the fund.	
The law enables funding to be released from the disaster fund when there is a forecast of a specified nature and scale. The law: ◦ clearly outlines the criteria for releasing funding (i.e., nature and scale of the forecast event); ◦ identifies the types of activities that can be funded; and ◦ establishes an expedited procedure for approving and releasing the funding.	
Checklist: Monitoring and Evaluation	
The law requires disaster authorities to develop a monitoring and evaluation framework that applies to all DRR actors (both government and non-government).	

The law requires DRR actors to conduct ongoing monitoring and evaluation of their programs and activities. As part of this process, DRR actors are required to collect and consider feedback from participants in their programs and activities. The law requires system-wide evaluations to be conducted periodically (e.g., once every five years) and after major disasters. This process is required to: include an assessment of existing disaster laws, policies and plans; provide opportunities for disaster-affected communities to make submissions; and result in a public report containing findings and recommendations. There is a dedicated office or official mandated to oversee monitoring and evaluation of DRR activities.	
Checklist: Coherence between DRR and CCA	
DRR and CCA policies and plans are coherent and aligned with one another. This includes (if applicable) the National DRR Strategy, the National Adaptation Plan and/or the National Adaptation Programme of Action.	
Policies and plans relating to DRR and CCA: ○ include cross-references to one another; ○ recognize the linkages and synergies between DRR and CCA; ○ are developed, reviewed and updated on the same timeframe; ○ adopt some shared goals and related performance indicators; and/or ○ use the same timeframes for implementation and reporting.	
There is strong collaboration and coordination between the authorities responsible for DRR and CCA including: ○ ongoing coordination mechanisms at both leadership and implementation levels; and ○ joint planning and implementation of projects requiring expertise from both sectors.	
Checklist: Planning prevention and mitigation measures	
The law mandates planning for disaster prevention and mitigation. Note: This may occur through a dedicated plan for prevention and mitigation, or a broader planning process that also addresses other components of DRR.	
The law identifies which actor will lead planning for prevention and mitigation. It also identifies which other actors will be involved. This includes departments or agencies responsible for land use, construction, infrastructure, the environment and natural resource management.	
The law requires the actors responsible for prevention and mitigation planning to consider the most recent, high-quality risk assessments when developing plans.	

There is a plan that addresses disaster prevention and mitigation. The plan: ○ is multi-hazard it addresses multiple major hazards; ○ is multi-sectoral- it identifies measures to be implemented across a wide range of sectors including land use, construction, infrastructure, the environment and natural resource management; and ○ clearly identifies roles, responsibilities and coordination mechanisms for all actors, including sectoral departments and agencies.	
Checklist: Land Use Laws and Building Codes	
Land use laws and plans identify 'high risk' zones which are highly exposed to hydrometeorological and geophysical hazards. They prohibit or heavily restrict new construction in these zones.	
The building code requires housing and critical infrastructure (e.g., hospitals, schools) to be built using disaster resilient designs and materials. Note: This requirement may be restricted to high- or medium-risk zones, as identified in land use laws and plans.	
There is a legal requirement for land use laws and the building code to be periodically updated based on the most recent hazard maps and risk assessments.	
The procedure for assessing and approving major infrastructure projects involves a multi-hazard risk assessment. It establishes that projects can only be approved if they have an acceptable level of risk and/ or integrate risk reduction measures (structural and non-structural) to adequately reduce the level of risk.	
The laws, plans and procedures identified above are well implemented. To the extent that there are weaknesses in implementation, practical measures are being implemented to strengthen implementation such as capacity building, increased funding and anti-corruption measures. The law provides financial incentives (e.g., tax concessions) and direct financial support (e.g., grants) for households to construct and/or retrofit housing using disaster resilient designs and materials.	
There are land swap or buy-back mechanisms to assist people to relocate away from high-risk areas.	
Environmental Laws and Nature-based Solutions	
DRR policies and plans recognize the role of NbS in reducing disaster risk and adapting to climate change. They identify specific NbS projects that will be implemented to reduce climate and disaster risk.	
Environmental laws establish a general prohibition on causing environmental damage and establish associated penalties. They require people and corporations to remediate	

environmental damage they have caused. These obligations are applicable to ecosystems that promote DRR and CCA.	
Environmental laws require environmental impact assessments (EIAs) for major new construction or development projects. The EIA process requires an assessment of whether the proposed construction or development would increase climate and/or disaster risk by negatively impacting ecosystems that promote DRR and CCA.	
Natural resource management laws prohibit or heavily restrict the exploitation of ecosystems that promote DRR and CCA. If permits can be granted to use or extract resources from these ecosystems, there are strict limits on the quantity and types of permits granted.	
Land use laws and plans prohibit (or strictly control) the use of areas containing ecosystems that promote DRR and CCA. They do not permit any development or use of these areas that would increase climate and/or disaster risk.	

Appendix 2- Law and Policy Evaluation Matrix

Table 5: Law and Policy Evaluation Matrix

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
Legislation					
Fisheries Act (Cap. 108)	x	✓	x	The Act acknowledges marine conservation through Marine Protected Areas (Sec. 23) but does not explicitly integrate NbS into DRR strategies. No provisions mandate specific NbS projects for disaster resilience. No legal requirement exists to assess impacts on ecosystems that mitigate climate risks, such as coral reefs, mangroves, or coastal wetlands.	-Integrate mangrove, seagrass, and coral reef restoration as legal DRR strategies. -Establish a Fisheries NbS Action Plan. -Expand Sec. 25 to cover coastal habitat destruction. -Mandate financial penalties for ecosystem degradation, directing funds to restoration. -Require EIAs for All Fisheries Development Projects -Impose Restrictions on Resource Exploitation-Ban unsustainable coral/mangrove extraction. -Implement Land Use Controls for High-Risk Coastal Areas-Prevent coastal development in storm-vulnerable zones and mandate buffer zones for critical marine ecosystems.
Fisheries (Marine Protected Areas) Order, SRO 77 of 2001; Fisheries (Marine Protected Areas) Regulations, SRO 78 of 2001				SRO 77 designates Woburn/Clarke's Court Bay and Molinière/Beauséjour as MPAs and allows planning for zones such as parks, reserves, sanctuaries, even "marine historical sites". Strictly prohibit destructive activities—extracting flora/fauna, coral removal, unpermitted anchoring—and set up special zones for recreation, research, protection. Strong on NbS (via marine protection), indirectly supports DRR and CCA through habitat conservation. Emphasizes conservation, which	Cross-referencing DRR/CCA policies; Including explicit disaster resilience goals in MPA management plans;

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				supports ecosystem resilience, but no formal DRR planning. Supports ecosystem protection beneficial for CCA, but no explicit link to DRR/CCA strategies	
Grenada's Beach Protection Act, No. 67; CAP. 29 (1979) and its 2009 Amendment				The Act offers clear ecological protection of coastal ecosystems—important NbS elements—and imposes legal penalties against damaging activities. Does not explicitly link beach protection to disaster resilience or climate adaptation within the text. Lacks mandatory remediation for offenders, EIA provisions, and land-use planning controls to prevent harmful development.	Include explicit references to disaster resilience NbS and EbA Add remediation clauses requiring restoration by violators. Mandate EIAs for major shoreline interventions to assess climate/disaster impact. Coordinate with land-use and planning legislation to restrict development in vulnerable coastal zones. Amend exemptions so that no removals are allowed unless they support resilience (e.g., climate adaptation projects).
Town and Country Planning Act CAP. 293 (1958) and Amendments Act 3 (1963), CAP. 339 (1990)				The Act's purpose is to regulate land use and development through planning permissions and zoning. It does not reference disaster risk reduction, climate change adaptation, or nature-based solutions (e.g., living shorelines, bioswales). There is no mechanism to identify or require NbS projects within statutory development plans. The Act lacks any definitions or requirements around nature-based solutions, missing an opportunity to embed green infrastructure and ecosystem-based	Include NbS in act through addition of ecosystem services etc. Amend "Part II: Control of Development" to require an Environmental Impact Assessment for any planning application that: - Is within a designated Hazard-Buffer Zone; - Proposes clearance or alteration of more than 0.5 ha of natural vegetation; - Involves construction within 50 m of watercourses, wetlands, mangroves, dunes, or steep slopes (> 15 %). The Act should state that no planning permission

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				approaches into statutory development plans. While EIAs are implemented via regulations, explicitly requiring the Planning Act to reference ecosystem-service impacts (e.g., coastal protection, flood attenuation) would ensure DRR/CCA considerations are front and centre in development control.	may be granted until the EIA has evaluated impacts on DRR/CCA ecosystem services.
Forest, Soil and Water Conservation Act Cap. 116 (1949) and the Amendment Ordinance No. 34 (1984)				The Act predates modern DRR and climate frameworks; it does not reference disaster risk, adaptation, or NbS terminology. The Act prohibits unauthorized felling, cultivation, and degradation of protected forest and watershed areas. However, it lacks provisions for mandatory remediation of environmental damage or penalties tied to broader ecosystem services or climate risks. While the Act restricts land use in protected areas, it is not structured as a land-use planning law. It does not explicitly link controls to disaster risk or climate vulnerability. Its focus is on erosion prevention and water conservation.	The Act's conservation mandate could be updated to incorporate DRR and CCA objectives. Legal provisions could be amended to require EIAs for activities in or near sensitive ecosystems. Linkages to land use planning and DRR frameworks could strengthen the NbS potential of the legislation.
National Parks and Protected Areas Act (Cap. 206)	✓	x	x	The Act establishes national parks and protected areas for conservation but does not explicitly reference disaster risk reduction (DRR) or climate adaptation strategies. Section 5:	Amend the Act to explicitly recognize NbS as a disaster resilience strategy. Establish a National Parks NbS Strategy that mandates projects like mangrove rehabilitation and wetland restoration.

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				National parks can be declared for preserving natural beauty, flora, and fauna, indirectly supporting NbS but lacking specific DRR or CCA considerations.	Expand penalties for destroying DRR-sensitive ecosystems (e.g., coral reefs, mangroves). Require responsible parties to restore damaged environments. Require EIAs before approving any infrastructure development in national parks. Ensure EIAs assess disaster risk impacts, including potential flooding, erosion, and biodiversity loss Introduce strict bans on unsustainable resource extraction within protected areas. Establish a permit system with strict quotas for any permitted activities.
Crown Lands Act (1896)	x	x	x	The Crown Lands Act (1896) provides a basic framework for the ownership and management of public lands, but it does not align with modern environmental laws or best practices in NbS for climate resilience and DRR. The Crown Lands Act (1896) requires substantial modernization to reflect current environmental, climate adaptation, and disaster risk reduction best practices.	-Amend the Act to incorporate NbS principles, ensuring that Crown Lands support climate resilience. Establish protected areas on Crown Lands that provide natural storm protection (e.g., mangroves, wetlands, coral reefs) integrating resource extraction and climate smart land use. Ban or strictly control the extraction of forests, mangroves, and minerals that impact DRR.
Grand Etang Forest Reserve Act (1923)	✓	x	x	The Act recognizes the importance of forest conservation for rainfall and water supply, indirectly supporting NbS principles. Section 3 states that all lands in the Grand Etang Forest Reserve shall be preserved for forest conservation, but it does not explicitly mention	Explicitly Recognize NbS for DRR and Climate Adaptation Amend the Act to include NbS as a core principle for climate resilience. Establish a Forest NbS Strategy, including afforestation, erosion control, and biodiversity conservation programs. Expand the Act to prohibit environmental damage within the reserve.

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				disaster risk reduction or climate adaptation.	
Wild Animals and Birds Ordinance	✓	x	x	The Ordinance establishes Grand Etang Forest Reserve as a sanctuary for wild animals and birds. Section 3 protects wildlife in the Grand Etang Forest Reserve, indirectly contributing to NbS for ecosystem stability and biodiversity conservation. However, the Ordinance does not explicitly recognize NbS as a strategy for disaster resilience or climate adaptation.	The Wild Animals and Birds Ordinance plays a crucial role in protecting wildlife and biodiversity, but it needs modern amendments to: Strengthen climate adaptation and disaster resilience policies Ensure strict environmental accountability for any land use changes Regulate sustainable activities while maintaining conservation
National Trust Act (Cap. 207)	✓	x	x	The Act establishes the Grenada National Trust as a corporate body responsible for the preservation of historic and natural sites. Section 5 allows the Trust to acquire and protect lands and marine areas for public benefit, indirectly supporting NbS. Sections 2(f) and (g) highlight the preservation of places of natural beauty and marine areas, but there is no explicit mention of NbS or its role in DRR and CCA.	Amend the Act to explicitly integrate NbS as a strategy for disaster risk reduction and climate resilience. Establish a National Trust NbS Action Plan, which includes wetland restoration projects for flood mitigation. Coastal ecosystem protection for storm surge reduction. Forest conservation efforts for landslide prevention and carbon sequestration.
Integrated Coastal Zone Management Act (2019)	✓	x	x	The Integrated Coastal Zone Management Act (2019) provides a strong foundation for coastal conservation, but it does not fully integrate NbS for DRR and climate	Strengthen zoning laws to restrict development in flood-prone and erosion-prone coastal areas. Require climate-smart building standards, such as elevated structures, permeable surfaces, and green infrastructure. Establish buffer zones around critical

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				adaptation. Section 4 mandates the development of a Coastal Zone Management Plan, which includes strategies and policies for managing coastal resources. Section 10 allows for the designation of Coastal Zone Management Areas, indirectly promoting NbS. However, the Act does not explicitly refer to NbS as a core strategy for climate adaptation and disaster risk reduction.	ecosystems to protect them from urban encroachment and pollution.
				Neither Act leverages green infrastructure (e.g., constructed wetlands for leachate treatment, vegetated berms for flood attenuation) as part of integrated waste management. Embedding explicit siting criteria that exclude ecologically critical areas (mangroves, seasonal wetlands, floodway's) would protect natural DRR assets.	Mandate Hazard-Buffer Zone Mapping & Protection The creation and regular updating of a national Hazard-Buffer Zone map (integrating floodplain, coastal erosion, landslide and wetland data). Automatic exclusion of these mapped zones from waste-facility siting, except where an approved EIA demonstrates no net loss of ecosystem service. Publication of these maps and buffer rules in the statutory Waste Management Regulations. Fee reductions or faster permit processing for facilities that integrate green infrastructure (e.g., treatment wetlands handling ≥ 50 % of leachate).
Physical Planning and Development Control Act (2016)	x	x	x	The Physical Planning and Development Control Act (2016): Section 3 states that the Act aims to ensure the sustainable use of land while considering environmental factors. Part VI (Protection of the Natural and Cultural Heritage) recognizes the importance of	Strengthen regulations to prohibit deforestation, mining, and large-scale land conversion in disaster-prone areas. Require permits with strict sustainability conditions for any resource use near sensitive ecosystems. Expand the concept of buffer zones around protected areas to prevent indirect environmental damage.

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				natural areas and establishes measures to protect them. However, the Act does not explicitly mention NbS as a climate resilience or disaster risk reduction strategy.	Implement climate-smart zoning laws, preventing construction in flood-prone areas. Enforce mandatory setbacks for developments near water bodies and coastal zones. Promote nature-based urban planning solutions, such as urban forests, permeable pavements, and stormwater management systems.
National Policies					
Coastal Zone Management Policy		x	x	The draft policy emphasizes “ecosystem-based coastal protection” (e.g., mangrove and dune restoration) and calls for living shorelines. However, it does not yet specify a pipeline of NbS projects, nor does it set targets, responsibilities or budgets for their implementation.	Include an annex of prioritized NbS interventions (e.g., “Restore 100 ha coastal mangroves by 2026”) with assigned lead agencies and financing sources. Add a requirement that any unauthorized removal or damage to coastal ecosystems must be followed by on-site restoration (e.g., planting native species) and post-restoration monitoring.
National Climate Change Policy for Grenada, Carriacou, and Petite Martinique (2017-2021)				The policy acknowledges ecosystem-based adaptation (EbA) as a key strategy for climate change mitigation and adaptation. The integration of climate resilience in land and coastal management is emphasized. The policy recognizes the importance of coastal zones, marine ecosystems, and watersheds in mitigating climate risks.	Strengthen the policy by explicitly defining nature-based solutions (NbS) and integrating them into climate risk management strategies. Develop a NbS Action Plan, which includes mangrove restoration for coastal flood protection. Reforestation and soil conservation to prevent erosion and enhance water retention. Green infrastructure development to support urban resilience.
Grenada Building Codes and Standards (2000)	x	x	x	The Code’s engineering-centric focus omits nature-based approaches (e.g., living shorelines, bioswales) that could complement hard-engineering measures. The 2000 Code focuses on structural resilience (wind loads, seismic	“Chapter 1: General Provisions” a new clause addressing NbS. Trigger an EIA for High-Risk, Ecosystem-Adjacent Structures Require incorporation of green infrastructure in stormwater management

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				design) but contains no reference to green infrastructure, ecosystem-based buffers, or other NbS approaches. While site-clearance provisions require removal of vegetation and control of erosion during construction, there is no explicit prohibition on harming adjacent ecosystems nor a duty to remediate beyond stabilizing the construction footprint. The Code itself does not mandate any form of Environmental Impact Assessment; oversight of environmental effects remains the remit of separate legislation (e.g. the EIA Regulations under the Physical Planning Act). Building standards regulate materials and structural systems but do not prohibit or limit extraction of natural resources (e.g., mangrove wood, coral aggregate) from hazard-buffering ecosystems. The Code includes minimum setbacks from the high-water mark and slope-stability criteria, which offer some protection of coastal and hillside ecosystems—but these are primarily for structural safety, not ecosystem conservation or NbS enhancement.	Strengthen setback and buffer Provisions to Protect Natural Buffers Prohibit extraction of building materials from critical ecosystems
OECS/ESDU St. George's Declaration:	x	x	x	The Declaration sets out high-level recognition of green infrastructure and ecosystem services, but Member States	Embed clear EIA triggers for developments in hazard-buffer areas (as part of Principle 3's integrated planning)

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
Principles on Environmental Sustainability				need detailed guidance (e.g., model projects, funding mechanisms, technical standards) to translate Principles 4 and 8 into on-the-ground NbS interventions.	Strengthening Principle 6 by adding explicit language on ecosystem rehabilitation (not just financial liability) would drive the recovery of DRR/CCA functions after damage. would ensure ecosystem-service impacts are systematically assessed. Under Principle 5, developing regional guidelines on maximum allowable extraction rates or permit quotas for mangrove, dune sand, and other critical habitats would protect natural buffers.
Tropical Forestry Action Plan (1985)	x	x	x	Include language for EIA triggers, NbS definitions, and buffer-zone mandates in new plan. TFAP's focus on watershed and soil conservation aligns with NbS principles but updating its language to explicitly recognize and label these approaches as "ecosystem-based DRR/CCA measures" would improve clarity and funding eligibility.	Introducing mandatory EIA or strategic environmental assessment (SEA) triggers for all large-scale forestry operations would ensure that impacts on slope stability, flood regimes, and watershed health are systematically evaluated before approval.
National Forest Policy (1999) and Strategy (2000)				The Policy emphasizes watershed protection, soil conservation, and agroforestry—measures that inherently contribute to flood attenuation and slope stabilization. However, it does not explicitly brand these as "Nature-Based Solutions" nor set out concrete NbS projects. The Strategy urges integration of forest-zone maps into land-use planning and establishment of no-disturbance buffers along streams. But there is no requirement for standardized hazard-	Introduce clear definitions of NbS in the Policy and specify flagship projects (e.g., riparian reforestation to reduce stream flooding, coastal mangrove restoration for storm surge attenuation). Revise the Strategy to include hectares-restored targets, legal enforcement of remediation orders, and multi-year monitoring of ecosystem recovery. Designate and quantify protection for all critical buffer ecosystems—mangroves, riparian corridors, upper-watershed forests—within the Policy text.

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
				mapping (flood or landslide), or statutory setback distances tied to DRR outcomes.	
Land and Marine Management Strategy (2011)		x	x	The Strategy promotes integrated coastal zone management, mangrove and coral-reef conservation, and upland watershed protection—all ecosystem-based measures that reduce flood and erosion risk. However, it does not explicitly label them as “nature-based solutions” nor set out clear project pipelines.	Define “Nature-Based Solutions” within the Strategy and include a prioritized project list (e.g., living shorelines, bioswale corridors) with timelines and budgets. Embed mandatory “no-net-loss” and “restoration first” clauses for any permitted disturbance of mangroves, wetlands or coral reefs, with penalties and remediation obligations spelled out. introduce specific thresholds (e.g., any shoreline modification, seabed disturbance > 0.1 ha) that automatically require an EIA inclusive of DRR/CCA ecosystem-service analysis.
National Environmental Policy and Management Strategy				The Policy highlights ecosystem conservation, watershed management, and green infrastructure as cross-cutting priorities. However, it does not explicitly frame these as “Nature-Based Solutions” nor identify concrete NbS projects or financing mechanisms tied to DRR/CCA.	Embed NbS Terminology & Project Pipelines- Introduce a dedicated NbS section with prioritized interventions (e.g., living shorelines, bioswale networks) and estimate budget needs. Amend to require restoration of critical habitats (wetlands, mangroves) as part of any enforcement order, with monitoring protocols. Mandate EIAs for any development within defined hazard-buffer zones (e.g., floodplains, steep slopes, coastal buffers) and require ecosystem-services risk analysis.
Grenada Biodiversity Strategy and		x	x	The BSAP highlights ecosystem restoration (e.g., mangrove replanting, coral-reef rehabilitation) as key	Introduce an NbS definition and require that all major habitat-restoration projects be evaluated for

Policy/ Act	NbS	CCA	DRR	Description	Recommendations
Action Plan 2016-2020				objectives. These actions inherently support flood and storm-surge buffering, but the document does not explicitly label them “NbS” nor integrate them into a broader DRR/CCA framework The BSAP calls for strengthened enforcement of protected-area regulations and “polluter pays” measures. However, it does not establish mandatory remediation targets for damaged habitats or require developers to restore ecosystem services lost through permitted or illicit activities.	their DRR/CCA benefits (e.g., modelled flood-attenuation capacity). Amend the BSAP to set annual hectares-restored goals and authorize enforcement agencies to impose on-site restoration conditions (or off-site compensation) for any permitted habitat disturbance. Recommend that any development within 50 m of wetlands, mangrove stands, coral reefs or riparian corridors automatically triggers an expanded EIA term of reference that includes DRR/CCA ecosystem-service assessment.

Appendix 3- Grenada's Blue Economy Programme

Grenada's Blue Economy Programme aims to harness the sustainable use of its 26,000 km² Exclusive Economic Zone—75 times the landmass—to drive green growth, diversify livelihoods, and build climate resilience.

Blue Growth Coastal Master Plan (2016)

Developed with World Bank support, this integrated spatial plan identifies priority coastal and marine zones for sustainable tourism, fisheries, aquaculture, renewable energy, and ecosystem restoration. It emphasizes mangrove and coral-garden nurseries, shoreline revegetation, and marine protected area expansion to buffer storm surge and curb erosion.

Unleashing the Blue Economy of the Caribbean (UBEC) Project

Financed by the World Bank and GEF, UBEC supports Grenada (and other Caribbean states) in scaling up aquaculture, mariculture, coastal replanting, and processing of fish-based byproducts, alongside training via a Marine Services Training School and a Blue Economy Incubator.

“Blue Grenada” Concept & Institutionalization

A partnership with the Netherlands' Ministry of Economic Affairs is drafting a Blue Grenada Concept Note to establish a dedicated Blue Growth and Oceans Governance Institute under a new Ministry of Blue Economy and Marine Affairs. This upcoming National Ocean Policy will codify governance, investment frameworks, and benefit-sharing mechanisms for coastal communities.

Private-Sector and Community Engagement

The programme promotes public-private partnerships in beach nourishment, waterfront development, marine tourism hubs, and blue incubators. Local fishers' cooperatives, women's groups, and youth entrepreneurs are engaged through targeted information sessions, financing support, and “you said, we did” feedback loops.

Vision and Outcomes

By balancing ecological stewardship with economic opportunity, Grenada seeks to:

- Increase marine-sector employment (fisheries, tourism, aquaculture) by 20% by 2028.
- Restore 500 ha of mangroves and 50 ha of coral reef habitat by 2030.
- Reduce coastal erosion rates by 30% in priority shoreline corridors.

Ongoing monitoring uses satellite imagery, community-based ecological surveys, and socioeconomic tracking to adapt interventions.

Appendix 4 - List of organisations participating in stakeholder consultations

The following organisations participated in stakeholder interviews and validation sessions:

- Clarke's Court Boatyard and Marina
- Grenada Hotel and Tourism Association
- Ministry of Agriculture, Lands and Forestry
- Ministry of Climate Resilience, the Environment and Renewable Energy
- Ministry of Economic Development, Planning, Tourism, ICT, Creative Economy
- Ministry of Public Infrastructure
- Ministry of Social and Community Development, Housing and Gender Affairs
- National Disaster Management Agency (NaDMA)
- St. Patrick's Environmental & Community Tourism Organisation

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