

UNITED NATIONS DEVELOPMENT PROGRAMME



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# Blue Economies and Nature-based Solutions

**FOR ENHANCED CLIMATE ACTION IN  
LATIN AMERICA AND CARIBBEAN  
SMALL ISLAND DEVELOPING STATES**

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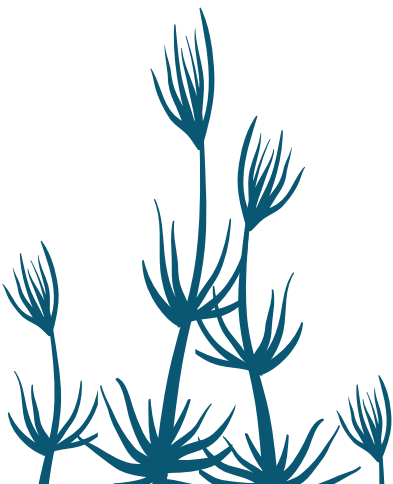
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# Acronyms

<b>AFOLU</b>	Agriculture, Forestry and other Land Use	<b>NAMA</b>	Nationally Appropriate Mitigation Actions
<b>BAU</b>	Business as Usual	<b>NAP</b>	National Action Plan
<b>ECLAC</b>	Economic Commission for Latin America and the Caribbean	<b>NbS</b>	Nature based Solutions
<b>EZZ</b>	Exclusive Economic Zone	<b>NBSAP</b>	National Biodiversity Strategies and Action Plan
<b>FPIC</b>	Free, Prior and Informed Consent	<b>NDC</b>	Nationally Determined Contribution
<b>FOLU</b>	Forestry and other Land Use	<b>REDD</b>	Reducing Emissions from Deforestation and Forest Degradation
<b>GDP</b>	Gross Domestic Product	<b>SDG</b>	Sustainable Development Goals
<b>GHG</b>	Greenhouse gas	<b>SIDS</b>	Small Island Developing States
<b>ICZM</b>	Integrated Coastal Zone Management	<b>TNC</b>	The Nature Conservancy
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>UNDP</b>	United Nations Development Programme
<b>IUCN</b>	The International Union for Conservation of Nature	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>LAC</b>	Latin America and the Caribbean	<b>VCS</b>	Verified Carbon Standard Program
<b>LULUCF</b>	Land Use, Land-use Change and Forestry		
<b>MRV</b>	Measurement, Reporting and Verification		

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# Foreword

In June this year, the '**High Seas Treaty**' was adopted providing the world with a legally binding instrument for the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction.

This treaty focuses not only on conservation and the sustainable use of marine biodiversity but also on economic justice and equity. It illustrates how coastal and marine habitats are increasingly gaining attention in the international climate and nature agenda and calls for more actions to safeguard important ocean ecosystems.

In this context, UNDP stands ready to support the implementation of this treaty while also working closely with countries on defining more ambitious management and conservation measures of broader ocean and coastal ecosystems that can also help accelerate sustainable development. In the last 25 years, UNDP has helped governments across the world to mobilize more than US\$1 billion for ocean protection and restoration actions in over 100 countries. Through its **Ocean Promise** and **Nature Pledge**, UNDP has also committed to support 100 coastal countries to maximize the potential of their blue economies through sustainable, low-emission and climate resilient use of ocean resources. In doing so, this can help to grow economies, create jobs, improve food security and reduce poverty and gender inequality by 2030.

As part of this commitment, UNDP is working closely with countries in Latin America and the Caribbean (LAC) and in particular, with Small Island Developing States (SIDS), to better integrate climate and nature in the development agenda by elevating ambitions and investments for the sustainable, long-term use and conservation of marine and coastal ecosystems. This resource guide reflects these efforts. It provides guidance and best practices, which hopefully will capacitate interested readers on how to position the role of marine and coastal ecosystems within broader blue economy concepts as these become increasingly central in NDCs and other national policy and planning frameworks. As the data produced in this document shows, investing simultaneously in the sustainable use and conservation of ocean and coastal areas can bring new opportunities for economic growth in LAC countries. For SIDS, this information should be particularly useful given their natural dependency on ocean resources.

We therefore hope that this report will serve as a source of inspiration for all policymakers and technical experts who are supporting work on blue economy. We thank the governments of Germany, Japan, the European Union, United Kingdom, Sweden, Spain, Belgium, Iceland, Italy, Portugal for supporting UNDP's Climate Promise Programme in Latin America and for providing the resources that allowed us to produce this report as part of UNDP's Water and Oceans Governance Programme.

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# About this publication

This resource guide provides advice on how to better integrate marine and coastal components within Nationally Determined Contributions (NDCs) for enhanced climate action. It presents the concepts of blue economy, blue carbon ecosystems and nature-based solutions (NbS) and discusses opportunities for their inclusion in NDCs. It does so by providing practical tips on how to better incorporate blue economy and NbS for the protection and restoration of blue carbon ecosystems in their NDCs and climate policy documents. Recognizing there are already valuable resources published on the topic, this guide draws from several existing resources, presenting them in a summarized and user-friendly way, while directing the reader to further tools and methodologies that they may wish to review in-depth based on their needs. This guide also reviews the status of Latin America and the Caribbean (LAC) Small Island Developing States (SIDS) to integrate these concepts into their NDCs and identifies opportunities where LAC SIDS can enhance actions to support a blue economy and blue carbon initiatives.

This resource guide is intended for policymakers and technical experts who are supporting work on blue economy. While the analysis and cases studies in the guide draw from LAC SIDS experience, the publication can be used by any country that is considering a blue economy approach. Its purpose is to pull together relevant knowledge and offer a summarized compilation of these materials highlighting the main findings and instruments for mainstreaming blue economy.

This guide is organized in four sections:

1. An introduction on the value of blue economy and its relation to nature based solutions and blue carbon ecosystems;
2. Guidance to integrate nature based solutions, blue carbon ecosystems and blue economy in NDCs;
3. A review on the status of blue economy in LAC SIDS and areas of opportunities for LAC SIDS to enhance their NDCs; and
4. A collated list of additional resources, tools, and guidance documents surrounding blue economy, blue carbon ecosystems, and blue carbon that allows readers to dive deeper into relevant material to expand the knowledge put forward in this publication.

# 1. Value of blue economy

Billions of people worldwide depend on marine and coastal ecosystems for their livelihoods. Ocean-based sectors are estimated to contribute US \$1.5 trillion to the global economy, supporting around 31 million jobs<sup>1</sup>. Besides the economic resources linked to these ecosystems, the ocean also plays a key role in climate change as it absorbs about 30 percent of the carbon dioxide produced by humans<sup>2</sup>, making them the largest long-term sink for carbon in the biosphere<sup>3</sup>. Blue carbon ecosystems, such as mangroves, coral reefs, and sea grasses, are important hotspots for biodiversity, while also providing protection against climate impacts. Globally, recent studies have estimated the value of blue carbon ecosystems at over \$190 billion per year and their ability to reduce costs associated with climate impacts such as flooding, erosion and storm surges is estimated to be over \$65 billion annually<sup>4</sup>. Recognizing the importance of marine resources to sustainable development, the 2030 Agenda included a Sustainable Development Goal (SDG 14) dedicated to oceans that aims to “sustainably manage and protect marine and coastal ecosystems”<sup>5</sup>. Not surprisingly, coastal and marine ecosystems have also emerged as a key factor in regulating the global climate and as such, the United Nations Framework Convention on Climate Change and the Paris Agreement encourage their inclusion in NDCs<sup>6</sup>.

As the SDG and climate agendas rise in prominence and priority, the concept of blue economy is providing a new paradigm to value and shape policy regarding these essential natural resources and how they

support economies, populations’ well-being, and a healthy environment. The United Nations Development Programme (UNDP) has defined blue economy as “the sustainable use of ocean resources for economic growth, jobs and social and financial inclusion, with a focus on preservation and restoration of the health of ocean ecosystems and the services they provide.”<sup>7</sup> Importantly, the blue economy places marine ecosystems and their protection, use and restoration at the core of its thinking. In doing so, it supports the sustainable use of ocean resources that supply food and livelihoods to the world’s population while also seeking enhanced or new sustainable economic opportunities that are derived from the oceans and move beyond business as usual. Within an ever-changing climate, the blue economy aims to be resilient, anticipating and responding to the impacts of climate change on marine and coastal environments, limiting associated socio-economic damage.

UNDP has defined blue economy as

**“The sustainable use of ocean resources for economic growth, jobs and social and financial inclusion, with a focus on preservation and restoration of the health of ocean ecosystems and the services they provide.”**

1 OECD. (2016).

2 UNDP. (2023b).

3 European Environment Agency. (2022).

4 Bertram et al. (2021); Leal and Spalding. (2022).

5 Ibid.

6 Lecerf, M., et al. (2021).

7 UNDP. (2023a).



## **Box 1: Description of blue economy, blue carbon ecosystems, and NbS**

### **Blue economy**

UNDP (2023a) defines the blue economy as “the sustainable use of ocean resources for economic growth, jobs and social and financial inclusion, with a focus on preservation and restoration of the health of ocean ecosystems and the services they provide”. This concept recognizes the connection between the natural capital in the ocean and the economic activities and benefits derived of the ocean economy. It acknowledges that if these ocean resources are depleted they can threaten jobs and economic growth in marine-based sectors. Thus, the blue economy looks to understand those interactions and manage them sustainably to increase the impact of natural assets on economic and environmental well-being.

Sectors in blue economy include both traditional ocean-based industries (fisheries, tourism and shipping) and emerging activities (offshore renewable energy, marine aquaculture, marine biotechnology<sup>a</sup> and bioprospecting<sup>b</sup>).

### **Blue carbon ecosystems**

Blue carbon ecosystems include both coastal and marine ecosystems that can sequester and store large quantities of carbon in the plants, ocean sediment, and ocean itself. These include habitats such as mangroves, tidal marshes, seagrasses and coral reefs. The Intergovernmental Panel on Climate Change (IPCC) (2019) defines blue carbon as “all biologically driven carbon fluxes and storage in marine systems that are amenable to management.” In addition to their mitigation benefits, blue carbon ecosystems are important to disaster risk reduction and contribute to ecosystem-based adaptation to climate change. They are effective at protecting coastlines from storms, waves, erosion and flooding. Moreover, for many islands and coastal cities, blue carbon ecosystems are essential natural capital assets that contribute significantly to the livelihoods of their population. Unfortunately, many are often degraded and undervalued and are losing their carbon sequestration capacity.

### **Nature-based solutions**

Although there is not an agreed definition for this term, IUCN (2016) has defined nature-based solutions as “actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits.” NbS are based on the notion that when ecosystems are healthy and well-managed, they provide essential benefits and services to people.

In the context of coastal and marine ecosystems, NbS in these habitats result in increased capturing of water, reduced storm surges, run-off and soil erosion, and increased coastal stability. In turn, these outcomes reduce vulnerability and increase the resilience of natural capital and human communities to climate change impacts. Additionally, NbS often are low-cost natural solutions when compared to man-made, engineered solutions. For instance, wetland and mangrove protection or reef regeneration can be more cost-effective at protecting coastal areas than constructing sea walls.

a. Biotechnology is the exploitation of biological processes for industrial and other purposes, especially the genetic manipulation of microorganisms for the production of antibiotics, hormones, etc.

b. Bioprospecting is the search for plant and animal species from which medicinal drugs, biochemicals, and other commercially valuable material can be obtained.

Blue economy approaches acknowledge the services and value marine and coastal ecosystems provide and how they can translate into market value. In the context of climate change mitigation and adaptation, strengthening blue carbon ecosystems is increasingly being accepted as an investable action in a sustainable blue economy. For adaptation, this translates into prioritising conservation and restoration of these habitats to increase their own resilience and to provide ecosystem benefits in the form of disaster risk reduction, coastline stabilization and the protection of livelihoods. When looking at mitigation benefits, the focus turns to these habitats ability to act as carbon sinks, and thus provide value through carbon markets.

While methodologies for estimating blue carbon are still being reviewed and although no consensus has been reached, it is clear, conserving blue carbon ecosystems is key to achieving our global climate targets and biodiversity targets<sup>8</sup> (see Box 2).

## **Box 2: Methodologies to calculate blue carbon**

Currently, blue carbon offset methodologies and implementation protocols exist for the voluntary carbon market, almost exclusively for mangroves and saltmarshes.<sup>a</sup> In 2020, Verra, which runs the world's largest voluntary GHG program, released its first blue carbon conservation methodology covering projects aimed at the conservation and restoration of wetlands, including mangroves, seagrasses and salt marshes. This methodology is expected to significantly unlock new sources of finance for blue carbon projects.<sup>b</sup> While blue carbon is currently only a small portion of the total value of the voluntary carbon market, estimated to be more than \$1 billion annually, blue carbon finance has the potential to grow overall investment in coastal and ocean nature-based solutions and resilience.<sup>c</sup> Notably, the voluntary carbon market is projected to increase 15-fold by 2030 and be 100 times larger by 2050.<sup>d</sup>

a. Kawae et al. (2022); b. Verra. (2020); c. Ecosystem Marketplace. (2021); d. Blaufelder et al. (2021).

Blue carbon ecosystems remove from the atmosphere 10 times more CO<sub>2</sub> than a tropical rainforest.<sup>9</sup> Although coastal habitats are estimated to cover only two percent of the total ocean area, they account for approximately half of the total carbon sequestered in ocean sediments.<sup>10</sup> Experts estimate that as much as 1.02 billion tons of CO<sub>2</sub> are being released annually from degraded coastal ecosystems, the equivalent of 19 percent of emissions from deforestation globally.<sup>11</sup> In addition to degradation from weather events, several anthropogenic pressures also negatively impact the Caribbean's nearshore marine resources. These include population growth, urbanization, coastal development, pollution, and over-exploitation of natural resources, including overfishing.<sup>12</sup>

8 Specifically, under the **Convention on Biological Diversity**, blue economy work can support Target 3 (ensure and enable that by 2030 at least 30 percent of terrestrial and inland water areas, and of marine and coastal areas, are effectively conserved) and Target 8 (minimize impacts of climate change and ocean acidification including through nature-based solutions and/or ecosystem-based approaches).

9 National Oceanic and Atmospheric Administration. (2022).

10 Thomas, T, et al. (2020). Blue Carbon Initiative.

11 Pendleton L, et al. (2012).

12 Ecosystems Division (2020).





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To halt threats to these ecosystems, Nature-based Solutions (NbS) have proven to be an effective approach to support conservation and restoration of these habitats. NbS can enhance the development of the blue economy by strengthening the capacity of blue carbon ecosystems to provide benefits and services to people through fisheries, tourism and other ocean-based sectors. As Figure 1 illustrates, the blue economy depends on healthy blue carbon ecosystems (mangroves, seagrasses and coral reefs) that provide positive socio-economic and climate contributions (both mitigation and adaptation) to the blue economy. These habitats can be conserved and restored through NbS, but if destroyed, can negatively impact socio-economic well-being and make communities more vulnerable to climate impacts.

Healthy blue carbon ecosystems provide a variety of ecosystem services that benefit people and contribute to the blue economy through outputs or outcomes that directly and indirectly affect human wellbeing.

**Figure 1. Relationship between blue economy, blue carbon ecosystems and NbS**

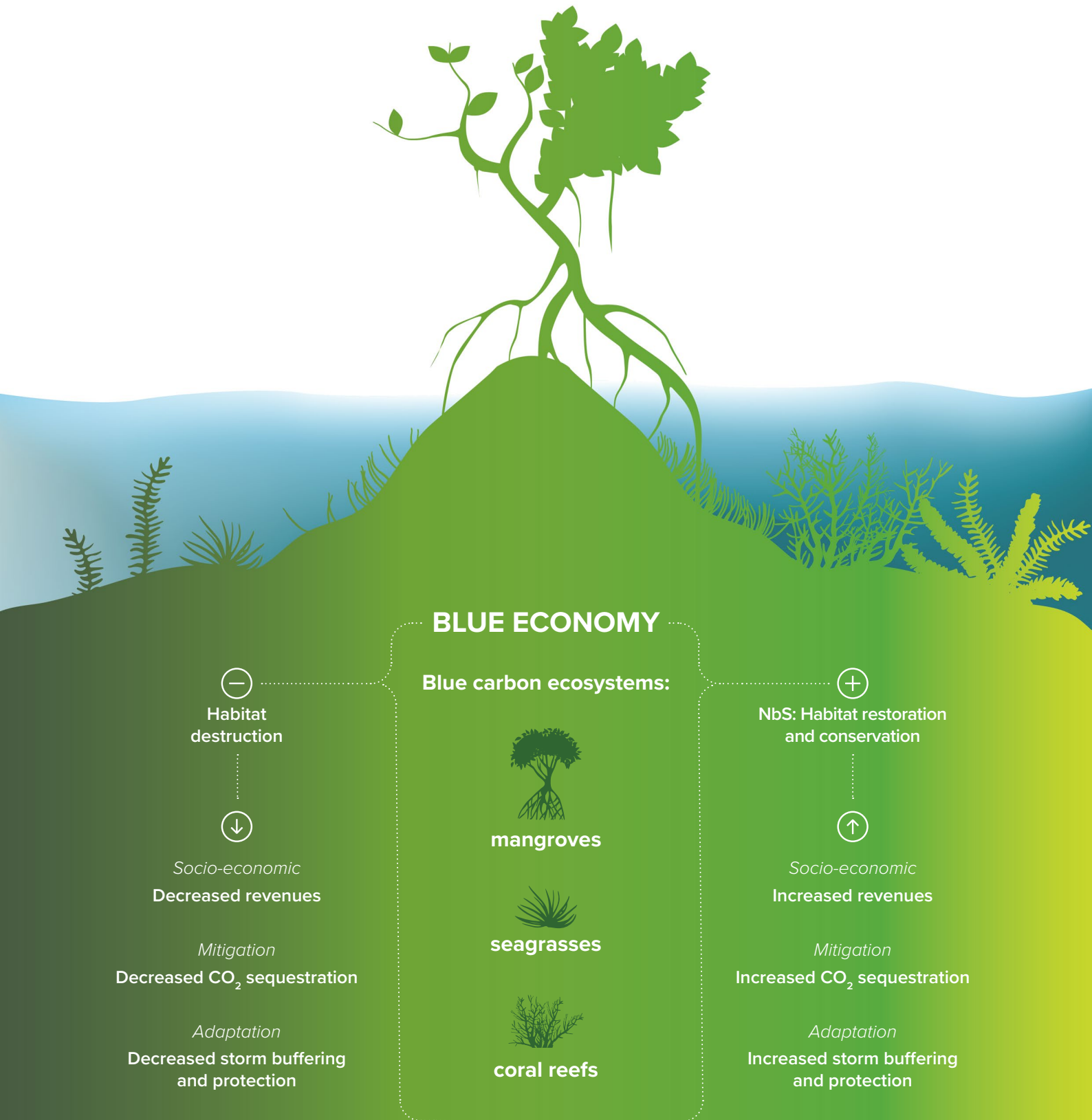
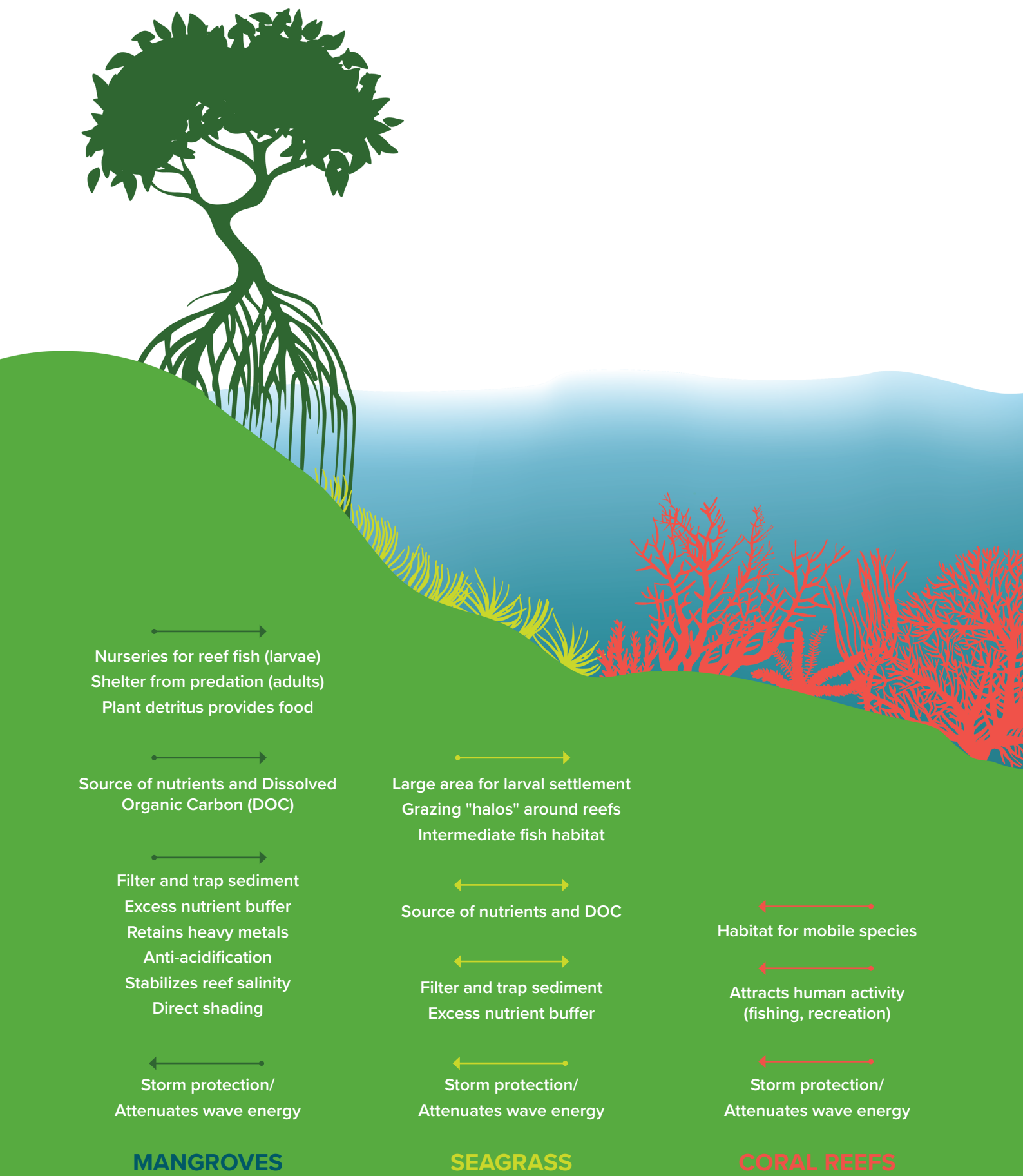


Figure 2. Ecosystem services provided by marine and coastal ecosystems



Source: Adapted from Carlson et al. (2021).

As shown in Figure 2, seagrasses and mangrove forests provide habitat for marine life while also offering significant protection to coastal communities and shorelines against risks from flooding, storm surges, erosion and the adverse impact these have on local economies. In fact, it has been found that these habitats can be even more effective than human-built breakwaters at reducing the height and energy of waves.<sup>13</sup> For example, **a recent study**, looking at 20 countries in the Caribbean, demonstrated that NbS that restore coral reefs and mangroves provide a tangible and cost-effective solution. Using methods from the risk and insurance industry, the study provides rigorous valuations of the ability of coral reefs and coastal wetlands to protect coastlines and shows that restoration efforts can deliver a positive return on investment, with the benefits from reduced flood damage exceeding the costs of restoration.<sup>14</sup>

Similarly, the Economic Commission for Latin America and the Caribbean (ECLAC) has evaluated the efficiency of corals and mangroves in Cuba to protect coastal assets. Not surprisingly, it found that coral reefs, along with mangroves, play a fundamental role in reducing the risk of coastal flooding. The presence of coral reefs provided an annual benefit of 65 percent less surface area flooded, 87 percent fewer people affected and a 90 percent reduction in infrastructure loss.<sup>15</sup> Mangroves helped reduce the area affected by flooding by 30 percent, with a 35 percent reduction in affected people and a 34 percent reduction in infrastructure damage.<sup>16</sup> Box 3 looks at common types of NbS in coastal and marine ecosystems while Box 4 illustrates UNDP's experience applying such approaches in Cuba.

### **Box 3. Types of NbS in coastal and marine ecosystems**

- Mangrove restoration and rehabilitation
- Coral reef restoration and protection
- Beach nourishment with natural sediment
- Dune restoration
- Living shorelines
- Seagrass bed restoration
- Salt marsh restoration
- Supporting oyster reefs and shellfish beds
- Developing artificial reefs
- Integrated Coastal Zone Management (ICZM)
- Integrated Coastal Erosion Management

### **Box 4: Ecosystem restoration in action in Cuba**

In Cuba, the Manglar Vivo Project supported by UNDP and the Adaptation Fund, has shown clear results from employing ecosystem-based solutions. Through the rehabilitation of coastal wetlands, including swamp forests, grasslands and mangroves, and the restoration of hydrological flows that interconnect them to seagrasses and coral reefs, the project has been successful at reducing the effects of damaging storm surges. After only 5 years of planting mangroves in the Gulf of Batabano, when tropical storm Laura hit the coast in 2020, was visible by the communities the dissipation capacity of mangrove forest even when the mangroves haven't reached it maturity. Previous studies affirm that for waves generated from storms of this category, in this area, mangrove forest are responsible for dissipating 90 percent of storm surge and wave attenuation. Surprisingly, despite the small size of the trees, none of them suffered loss despite the impact of the storm, providing evidence that the investments made on restoration can be sustainable. A follow-up project, funded by the Green Climate Fund, Mi Costa, is set to build from the results generated under Manglar Vivo and continue to apply ecosystem-based approaches to increase the resilience and adaptation capacity of the Cuban coastline.

13 Ferrario et al. (2014).

14 Beck et al. (2022).

15 CEPAL. (2018).

16 Ibid.



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We know that impacts from climate change are only going to increase in frequency and magnitude. Scientists are predicting that the percentage of storms that reach Categories 4 or 5 will continue to increase in the Caribbean Sea.<sup>17</sup> It is estimated that by 2050 annual losses related to extreme weather events will cost the region \$22 billion—a figure representing 10 percent of the current regional economy.<sup>18</sup> This reality, compounded by ecosystem degradation from anthropogenic factors, means that Caribbean countries must make resilience-building a priority. An important opportunity exists; by transitioning to a blue economy countries can harness coastal and marine resources sustainably to support food security, reduce poverty and respond to climate change impacts. In doing so, they can accelerate their journey towards a cleaner and more sustainable future.

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17 National Oceanic and Atmospheric Administration. (2022).

18 Inter-American Development Bank. (2014).



## 2. Integrating NbS, blue carbon ecosystems and blue economy in NDCs

A critical way to increase the conservation and protection of marine and coastal ecosystems is to recognize their value as a potentially significant contribution to achieving both the mitigation and adaptation goals of NDCs. NDCs offer the opportunity for countries to increase ambition and improve resiliency, in a cost-effective manner, by enhancing the role of nature, including blue carbon ecosystems, as a climate solution. Elevating marine and coastal ecosystems in NDCs will build further support for their protection and consequently, contribute to improving livelihoods and reducing inequality, securing food and water, improving resilience and disaster risk reduction, and biodiversity conservation. Moreover, the restoration and conservation of blue carbon ecosystems can increase their sequestration and storage service capability. In other words, employing NbS to strengthen blue carbon ecosystems enhances the blue economy.

Positioning these marine and coastal ecosystems within the greater blue economy concept in NDCs is especially important for countries whose economies largely rely on ocean resources, such as LAC SIDS.

This section offers a summarized compilation of key considerations to integrate blue carbon ecosystems and the blue economy in NDCs. This includes looking at the enabling environment needed to assess the value, progress and development of ocean inclusive NDCs and tips on which areas of the NDCs can speak to blue carbon ecosystems and improve the opportunities for blue economy in the context of NDCs. As mentioned in the opening of this publication, this resource draws from relevant existing materials and in some cases, condenses information, providing the reader the opportunity to consult these resources for more in-depth analysis.

### 2.1 Enabling environment foundations

To begin, linking blue carbon ecosystems and NbS to the blue economy in an NDC, there are policy, governance, regulatory, financial, and technical conditions that need to be considered. Creating the right enabling environment will be key to paving the road for a robust “blue” NDC and its effective implementation. As with any sector, an assessment to identify opportunities for emission reduction, adaptation and disaster risk management in relation to blue ecosystems will be an entry point to get an overall consensus. Four areas of enabling conditions have been identified to facilitate the effective integration of blue NDCs: governance and stakeholder engagement; policy, legal and regulatory environment; financial environment; and data systems for each area a description is provided, accompanied by a table that includes:

- Guiding **questions** to conduct a blue carbon readiness assessment. By going through these questions, a country can identify opportunities and entry points, limitations and areas where improvements are needed to strengthen that enabling area or condition.
- A set of **actions are suggested** to strengthen each enabling condition.

The identification of gaps throughout the assessment questions should not be considered as an obstacle to including blue carbon in NDCs but should rather can be used as entry points to establish an action plan aimed at increasing integration in climate policy and future NDC revisions.

## A. Governance and stakeholder engagement

As in any political and transformational process, strong leadership, coordination, and participation is required. In that sense, this condition looks to first, identify key stakeholders and institutions that are involved in policy making and/or management of blue ecosystems and blue economy, and second, guarantee their inclusion and buy-in. Strong political and transparent stakeholder engagement and coordination should underpin the expansion of the blue economy in a country and will be needed for the development and implementation of ocean inclusive NDCs. Effective collaboration between stakeholders (government and non-governmental) is essential to reach any objectives that will be set in NDCs regarding blue carbon ecosystems.

Readiness assessment questions	Actions to enable strong governance and stakeholder engagement
<ul style="list-style-type: none"> <li>• What ministries/institutions are involved in policy making/managing blue ecosystems/blue economy? Which are leading ministries and which are supporting ministries?</li> <li>• What ministries/institutions are charged with supporting conservation and habitat protection? Are they the same as those involved with managing blue ecosystems/blue economy?</li> <li>• Are there existing governance arrangements and coordination mechanisms between the ministries identified above? Are the roles and responsibilities clearly established?</li> <li>• What other ministries may play an important role and why (e.g., Ministry of Finance, Ministry of Planning, National Statistics Institutes, etc.)?</li> <li>• Are there any research institutions, academia, or private sector business associations conducting studies on coastal ecosystems that may contribute relevant capacities, information or data?</li> <li>• Is there a stakeholder mapping that identifies civil society groups, Indigenous Peoples and private sector actors or industry associations related to blue economy sectors?</li> <li>• What is the role of stakeholders in accessing, using, and managing blue carbon ecosystems? This includes private sector, local/sub-national governments, civil society groups, Indigenous Peoples and local communities.</li> <li>• Do stakeholders have technical capacity in blue economy concepts, blue carbon, and NbS?</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a broad stakeholder mapping for both government- (across various levels-national, sectoral, and sub-national) and non-governmental stakeholders to identify their roles and capacities in the blue economy and blue carbon ecosystems management. This mapping exercise should include anyone who will be directly/indirectly affected (positively or negatively) by the development and implementation of NDCs related to marine and coastal ecosystems.</li> <li>• Consider the engagement approach with each stakeholder group and develop a stakeholder engagement plan. This plan should follow international standards in terms of engagement with Indigenous Peoples and local communities (if applicable) and be gender-responsive.</li> <li>• Ensure Free, Prior and Informed Consent (FPIC) is respected (if applicable).</li> <li>• Engage existing NDC coordination mechanism and ensure blue economy stakeholders are actively part of discussions and decisions regarding blue NDCs. This can facilitate coordination, data sharing, and ownership for the implementation of actions. Ensure that there is agreed leadership for this committee and government/ministry buy-in.</li> <li>• Support capacity building for relevant stakeholders in blue economy, blue carbon, and NbS as relevant and needed.</li> </ul>

The International Association for Impact Assessments has compilations of key references for public participation, Indigenous Peoples and Gender Impact Assessments which can help as guiding documents to strengthen stakeholder engagement.

## B. Policy, legal and regulatory environment

To design NDC actions related to blue ecosystems and the blue economy, the political, legal and regulatory frameworks needs to be understood and potentially adapted to accommodate this. Determining a country’s policy and planning context includes identifying alignment and gaps with existing policies, strategies, and planning processes to integrate blue economy. It is important to consider different levels of policy including national, sectoral and sub-national. In addition, the legal and regulatory context can help determine how to include blue carbon actions in NDCs by mapping strategic barriers and actions needed to unblock these obstacles in legal or regulatory terms.

Readiness assessment questions	Actions to strengthen the policy, legal, and regulatory environment
<ul style="list-style-type: none"> <li>• What are the current <b>policies and/or strategies</b> that manage or impact blue economy and blue carbon ecosystems at national (i.e., National Development Plan, NDCs, NAPs, NBSAPs, policies for coastal development or marine resources etc.), sectoral, and/or sub-national level?</li> <li>• What is the country’s policy framework for conservation of natural habitats and/or for NbS? Are there existing protected areas for coastal ecosystems or plans to increase protection of these habitats?</li> <li>• Is there a national policy, strategy, law or decree on carbon markets? Is blue carbon included?</li> <li>• Are there certain sectors (and therefore sector policies and plans) that are part of and/or blue economy? Which sectors are these and why?</li> <li>• Are there overlapping sectoral mandates or development objectives that contribute to increasing habitat degradation of coastal ecosystems? If so, what are they and why?</li> <li>• What sectoral, national, subnational or <b>urban plans</b> exist to guide blue economy and/or coastal ecosystem management/adaptation actions?</li> <li>• Are there any <b>laws</b> or <b>decrees</b> related to specifically ocean resources, blue economy, or more broadly, conservation/protection of environment?</li> <li>• What are the biggest gaps in capacity (legal, and regulatory)?</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct a full review of national and sector-level policies, strategies, development plans, and decrees and laws, to determine alignment and cohesion with blue economy and/or where gaps exist.</li> <li>• If needed, revise, amend, or create policies and/or strategies/ that address policy gaps in relation to blue economy and blue carbon markets.</li> <li>• Utilise governance mechanisms (such as inter-institutional committee suggested above) to track policies and harmonize planning, regulatory and legal mechanisms.</li> <li>• Identify blue economy sectors that can benefit from NbS measures to either improve resilience (adaptation) and/or improve carbon sequestration (mitigation) and map opportunities in each sector including co-benefits.</li> </ul>

## C. Financial environment

Understanding the financial environment will be key to implementing blue economy actions in NDCs. The actions suggested under this area can facilitate a country to access more funding and be more efficient about assigning resources for these actions.

Readiness assessment questions	Actions to strengthen the financial environment
<ul style="list-style-type: none"> <li>• What is the current funding support for developing and implementing policies related to blue carbon ecosystems? Consider both public and private and domestic and international sources.</li> <li>• Are there sectoral (both at national and sub-national level) budgets assigned for ocean resources, coasts or blue economy or more broadly, for the conservation/protection of the environment?</li> <li>• Do ministries at national, sectoral and sub-national levels have sufficient financial capacity to implement actions on coastal ecosystems?</li> <li>• Does the country have active programs or projects in carbon credit markets?</li> <li>• What are the biggest financial gaps to implement policies related to blue carbon ecosystems? Why do these gaps exist?</li> <li>• What strategic partnerships (i.e. private sector, development partners) are in place to support financing for blue economy and blue carbon ecosystems?</li> </ul>	<ul style="list-style-type: none"> <li>• Promote cost-sharing between ministries whose mandates intersect with blue economy sectors.</li> <li>• Include blue economy as a category and public budgeting.</li> <li>• Allocate funds in all levels of government corresponding to the mandates of each sector.</li> <li>• Consider financial mechanisms that can help channel resources for the blue economy like blue carbon markets, blue bonds, debt for nature swaps</li> <li>• Identify opportunities for private sector investment in blue economy such as sustainable fisheries, marine tourism, marine energy, etc.</li> <li>• Explore payment for ecosystem services (PES) models for coastal zones.</li> <li>• Consider blue economy projects for GEF, GCF and other climate finance windows.</li> <li>• Identify potential strategic partnerships that can leverage and supplement existing financial resources.</li> </ul>



## D. Data systems

The fourth area that will be central to strengthening actions for blue NDCs is the amount, quality, and capacities surrounding information and data systems. Data is not only vital to evidence-based policy and decision making for the blue economy, it also can support the measurement of progress, especially of any blue economy commitments and/or targets made in NDCs. Specifically, data related to carbon stocks in blue carbon ecosystems is essential to developing a blue carbon inventory. A blue carbon inventory provides data on a nation's blue carbon stocks and importantly provides a baseline that can be used to measure progress and underpin blue carbon market work. However, it is important to note that countries can still include blue economy in their NDCs without having a blue carbon inventory. In such a context, NDC actions could support the development of such an inventory. Because NDCs are revised every five years, NDC actions can be adjusted to account for improvements made in data collected or data systems established.

Readiness assessment questions	Actions to strengthen data availability
<p><b>Related to inventory/mapping of blue carbon:</b></p> <ul style="list-style-type: none"> <li>• Have the nation's blue carbon ecosystems been mapped (both those that are under protection and those not)?</li> <li>• Do methodologies to calculate blue carbon stocks for relevant coastal ecosystems exist?</li> <li>• Do calculations of blue carbon stocks and carbon storage (mitigation potential) exist?</li> <li>• Do calculations of ecosystem services in terms of adaptation by blue carbon ecosystems exist?</li> <li>• Are there local emissions factors for blue carbon ecosystems?</li> <li>• Does mapping and data on the extent and change of habitat coverage over time exist?</li> </ul> <p><b>Related to qualitative data-contextual information:</b></p> <ul style="list-style-type: none"> <li>• Have drivers of blue carbon ecosystems habitat degradation been identified?</li> <li>• Is there gender-responsive data on economic sectors/population involved in blue economy activities and values (historical and projections)?</li> </ul> <p><b>Related to operational issues:</b></p> <ul style="list-style-type: none"> <li>• Are there relevant institutions, ministries and/or departments mandated with regular or systematic data collection on the above?</li> <li>• Are these entities a part of coordination mechanism for blue economy?</li> </ul>	<ul style="list-style-type: none"> <li>• Allocate funds and training for data analysis regarding blue carbon.</li> <li>• Develop a national monitoring, reporting and verification strategy for blue carbon stocks or include in existing MRV systems</li> <li>• Support local monitoring and data collection efforts.</li> <li>• Create collaborative partnerships with academic/research institutions to sustainably collect and manage current and future data.</li> <li>• Create data-sharing mechanisms between institutions and sectors.</li> <li>• Improve data collection systems and processes gradually.</li> </ul>

**The Blue Carbon Initiative has developed a tool to help countries determine their level of engagement with blue carbon that relates to many of the conditions described above. The tool can help a country prioritize actions based on this level of engagement. For more details check Table 1 and 2 of the [BCI guide](#).**



A readiness assessment of these enabling conditions and an understanding of where improvement and strengthening is needed as well as where opportunities exist, will help countries decide where and how to start on their journey to bolster blue economy approaches and integrate them into the NDC.

## 2.2 Guidance to include references to blue economy in NDCs

The readiness of enabling environment conditions will provide direction for the scope of how blue economy concepts and actions can be integrated in NDCs. This section describes the different components of an NDC and where coastal wetlands<sup>19</sup> can be considered and included.

To help determine if coastal wetlands should be included under adaptation or mitigation in an NDC, the below decision tree in Figure 3 can assist countries in determining this:

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<sup>19</sup> The term of coastal wetlands is used to refer to activities in coastal areas of mangrove forests, tidal marshes, and seagrass meadows as per the [2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands](#). It encompasses activities this publication refers to under blue carbon ecosystems and blue economy.

**Figure 3. Decision tree to integrate blue carbon under adaptation or mitigation in NDCs**



Does your country have one of these habitat types ("blue carbon"), and/or other coastal ecosystems (mangrove, salt marshes, seagrasses)?

YES

NO

Guidelines are N/A

Does your previous NDC mention blue carbon directly or indirectly?

YES

NO

No, but want to include it:

- Check domestic blue carbon policies as starting point for inclusion in NDC
- Identify mitigation/adaptation relevance & potential
- Promote NDC integration

YES

### Including blue carbon in NDCs

For either mitigation and adaptation, consider co-benefits across both sectors.

**ADAPTATION**

**BOTH**

**MITIGATION**

Focus on vulnerable communities and resilience

Synchronize with NAPs and wider MEAs (e.g. Ramsar)

Adopt blue carbon adaptation targets

Adopt blue carbon mitigation targets

Consider whether mangroves fit under REDD+ program (and need to include soil carbon separately)

Explicit commitment to use of 2013 Supplement

Source: Adapted from Blue Carbon Initiative. (2023).



This decision tree provides an entry point to approach integrating these concepts into an NDC. In order to provide further guidance, Table 1 below mirrors the main structure of an NDC and provides advice on how each section can include and highlight coastal wetlands with examples of NDCs of LAC SIDS. The examples in this table are mainly sourced from the updated NDCs from **Belize**, **Barbados** and **The Bahamas**. These examples by no means are prescriptive but rather are used to illustrate how NDC integration has been done. In turn, countries should adjust to their national context. In addition, while the mitigation components of NDCs are more uniform across NDCs, the adaptation component has less structure. Therefore, the section divisions below might change from one NDC to another, but they aim to lay out the main elements that could be included, recognizing national circumstances as mandated by the UNFCCC.

To the extent possible, countries can use the **2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands** (Wetlands Supplement), to include blue carbon ecosystems in their National GHG Inventories. The Wetlands Supplement was developed to account and provide coverage of inland organic soils and wetlands on mineral soils as well as coastal wetlands including mangrove forests, tidal marshes and seagrass meadows and constructed wetlands for wastewater treatment. Thus it provides guidance for countries that want to include land-use and management activities in these coastal ecosystems. Following these guidelines, activities on the coastal areas will fall under the land area of the AFOLU sector. The precise land-use category (Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land) under which land is reported will depend on national land-use category definitions, data collection systems and tracking of land transitions.

Countries do not have to cover all these elements and can add them progressively as they enhance some of the elements of the enabling environment mentioned above. For example, some countries might not have GHG accounting of coastal wetlands and can just include references in their national context or start in their adaptation section as they increasingly progress to mitigation elements.

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**As mentioned in the introduction there are other tools that can provide more in-depth guidance on NDCs calculation and methodologies. This table draws on some of the information on The Blue Carbon Initiative: “Blue Carbon and Nationally Determined Contributions”. For more details, especially in terms of blue carbon inventories, please refer to [this guide](#).**



**Table 1. Examples of how to include coastal wetlands in NDC sections**

Section	Sub-section	How to	Examples <sup>20</sup>
<b>NDC introduction / national context</b>			
<b>National context</b>	Impacts of climate change	Describe short-term and long-term impacts of climate change related to coastal wetlands, describing risks and vulnerability. Examples include increases in extreme weather events, coastal erosion, storm surges, sea level rise, flooding, saltwater intrusion and ocean acidification. Include facts and statistics where possible.	<p><b>Belize:</b> “Impacts experienced in the country to date include sustained droughts, floods, increased coastal erosion and changing precipitation patterns.” “Belize City is especially vulnerable to flood damage due to its low-lying land and exposed positions on the coast; low lying topography makes the country’s coastal areas especially vulnerable to sea level rise.”</p> <p><b>The Bahamas:</b> “The Bahamas is extremely vulnerable to the effects of disasters and climate change, as some 80 percent of the landmass is within 5 ft (1.5 m) of mean sea level and coastal areas hold the majority of the population and economic activity.” “Sea swells from extra-tropical cyclones during the winter season often cause flooding in The Bahamas, due to its low relief, along with beach erosion (The World Bank Group, 2022). In addition, sea level rise (SLR) can lead to coastal flooding. Since most of the islands’ infrastructure and settlements are located along or near the coast, serious economic and social consequences for residents and the tourism sector are realized.”</p> <p><b>Barbados:</b> “The climate change risk profile of Barbados is dominated by coastal and weather effects, especially sea level rise, storm surge, increased tropical storm and hurricane intensity and frequency; and other more slow-onset environmental impacts, such as flooding and drought, which is a very important and specifically Barbadian nuanced issue, as the country already suffers from water scarcity, and changes in rainfall patterns exacerbate this considerably.”</p>
	Impacts of climate change	Mention relevant sectoral impacts of climate change to blue economy sectors such as tourism, fisheries, and transport/shipping. Include facts and statistics where possible.	<p><b>Belize:</b> “The tourism industry in Belize, which is largely nature based and dependent on natural resources, will primarily be affected by extreme weather events, flooding, inundation, saltwater intrusion and erosion which will occur as a result of rising sea levels. Climate change will threaten the health of Belize’s coral reefs and will affect water supplies and physical property, all of which are critical for the sustainability of the sector. The combined effects of reduced tourism demand, loss of infrastructure, loss of beaches and the loss of the barrier reef can result in the reduced income of approximately USD\$ 24 million per year.”</p> <p><b>The Bahamas:</b> “Tourism represented the country’s largest industry and source of income, constituting 50-70 percent of GDP and directly employing 65 percent of the workforce (Rolle et al., 2020). In The Bahamas, tourism includes cruise ship visitors, stopover visitors and sailing guests. Tourism directly or indirectly employs approximately 50 percent of the Bahamian population. Reefs play a vital role in The Bahamas’ economy as reef diving and snorkeling are an important part of the country’s tourism industry (The Government of The Bahamas, 2020).”</p>

<sup>20</sup> Examples provided are direct quotes from the most up-to-date NDC versions communicated by the Parties to the UNFCCC. These can be accessed at the [NDC Registry](#).

Section	Sub-section	How to	Examples
	Policy framework/ institutional landscape	Describe existing policies, institutional arrangements, and frameworks that align the NDC process with both international and domestic policy frameworks such as NAPs, Adaptation Communications, national development plans, sectoral policy or development plans and any coastal management policies/plans in relation to coastal wetlands, blue economy, of (blue) carbon markets.	<p><b>The Bahamas:</b> “As part of the country’s response to climate change impacts, The Bahamas has developed in 2005 a National Policy for the Adaptation to Climate Change that focuses on ten (10) main sectors of the Bahamian economy: Agriculture, Energy, Transportation, Coastal and Marine Resources and Fisheries, Forestry, Tourism, Human Health, Human Settlement, Water resources, and Finance and Insurance.”</p> <p>“Carbon Credit Trading Act- This draft Bill has already gone out for public consultation in 2022. The Carbon Credits Trading Bill 2022 seeks to establish a regulatory framework for the trading of carbon credits in or from the Bahamas.”</p> <p><b>Barbados:</b> “Cabinet approval of the Integrated Coastal Zone Management (ICZM): the Barbados Policy Framework (2020-2030) includes an approval of the Coastal Zone Management Plan that aims to incorporate natural capital categories in national assets accounting.”</p> <p>“Debt for Nature Swap: The Ministry of Maritime Affairs and Blue Economy (MMABE) has been collaborating with The Nature Conservancy (TNC) to establish a conservation trust fund in Barbados as part of a maritime Debt for Nature Swap to draw the linkage between reducing a country’s debt and protecting its environment. In addition, 30 percent of Barbados’ Exclusive Economic Zone (EEZ ) would be dedicated to conservation as a Marine Managed Area (MMA).</p>
<b>Adaptation component<sup>21</sup></b>			
<b>Context</b>	National context/ background/ goals/ needs	Describe the importance of coastal wetlands and how protecting these ecosystems can provide adaptation services. If not already discussed in previous national context section, alignment with adaptation policies and plans (i.e., NAPs), adaptation planning mechanisms, and other policies in relation to blue economy and coastal wetlands can be included here as well.	<p><b>Belize:</b> “In addition to important mitigation benefits, Belize recognizes the many co-benefits coastal wetlands and coral reefs offer for adaptation to climate impacts and building resilience for coastal communities. The coastal zone is fundamental to the lives and livelihoods of many Belizeans.”</p> <p>“Belize recognizes the many co-benefits coastal wetlands and coral reefs offer for adaptation to climate impacts and building resilience for coastal communities. Protection and restoration of mangrove and seagrass ecosystems not only provides emissions reductions benefits, but also will ensure Belize is better placed to protect vulnerable communities and their livelihoods, safeguard its rich biodiversity, and develop sustainably.”</p>

21 The structure of the adaptation section in NDCs varies from country to country. This table provides examples of areas where blue economy themes could be included in NDCs.

Section	Sub-section	How to	Examples
Targets and actions <sup>22</sup>	Coastal zone and marine resources	Include information on sectoral adaptation targets and/or actions for coastal and marine resources. These can be quantitative or qualitative targets. Targets should aim to be measurable and time bound wherever possible.	<p><b>Belize:</b> (Target) “Increase resilience to climate impacts for coastal communities and habitats by managing further development of the coastline to reverse net coastal habitat and land loss by 2025.”</p> <p>“Strengthen the resilience of coastal communities by developing an early warning system for storm surges by 2025.”</p> <p>(Action) “Develop and implement a national seagrass management policy including an updated seagrass map and identification of priority seagrass areas for further protection to enhance conservation.”</p> <p>(Action) “Monitor coastal erosion and update coastal adaptation strategy every 5 years through the development of a National Beach Erosion Monitoring program.”</p> <p><b>Bahamas:</b> “Develop and implement a plan for integrated coastal zone management to promote a sustainable development of coastal zones.”</p> <p>“Increase awareness of the importance of coral reefs and mangrove forests for sustainable development and coastal protection.”</p>
	Fisheries and aquaculture		<p><b>Belize:</b> (Action) “Build national capacity to gather climate data to inform management. Develop and implement mangrove and fisheries conservation and management plans including the 20 percent of territorial waters included in Marine Protected Areas and strive to include 10 percent of territorial waters in marine replenishment zones”.</p> <p>(Action) “Implement and enforce 2020 Fisheries Act and 2018 Forests (Protection of Mangroves) Regulations. Develop and adopt fisheries regulations to complement the 2020 Fisheries Act.”</p> <p><b>Bahamas:</b> (Action) “Assess climate change risk and impacts on the agriculture/fisheries sector (productivity and food security).”</p>
	Tourism		<p><b>Belize:</b> (Action) “Provide support to coastal planners and policy makers in selecting appropriate policies and adaptation strategies that meet climate adaptation, developmental and environmental goals, taking into account the most vulnerable stakeholders, and linkages to the Integrated Coastal Zone Management Plan.”</p> <p>(Action) “Identify and assess coastal tourism areas that are vulnerable to climate change. Assess carrying capacity of sites that are identified as vulnerable.”</p>
	Forestry <sup>23</sup>		<p><b>Bahamas:</b> “Enhance protection and restoration of damaged/degraded ecosystems (e.g., terrestrial forests, mangroves, coral reefs).”</p> <p>“Promote Nature-Based Solutions (NbS) approaches to sustain ecosystems that ensure resilience against climate-related threats (ex. Coral reef and mangrove) involving local communities.”</p>

22 Countries are not required to present targets and actions under adaptation; this guide intends to illustrate how LAC SIDS are referencing these themes in their adaptation targets and actions. The sub-sections and division by sector are also a suggestion as the UNFCCC does not prescribe a format for the adaptation component in NDCs. Some actions could be considered cross-sectoral.

23 Depending on how the country defines forests, these can overlap with the Coastal and Marine Resources section.

Section	Sub-section	How to	Examples
<b>Mitigation component</b>			
<b>Targets and actions</b>	Economy wide target	The total contribution of emissions can include coastal wetlands following the <u>IPCC 2013 Supplement of Wetlands</u> . If blue carbon has not been accounted the country can start by including sector-specific targets (GHG and non-GHG) if there is not enough data for headline economy-wide targets.	<b>Belize:</b> “Reduce GHG emissions and increase GHG removals related to land use change totaling 2,053 KtCO <sub>2e</sub> 11 cumulative over the period from 2021 to 2030 <sup>24</sup> .”
	<b>Sectoral targets</b> Countries can integrate coastal wetlands as its own sector or by including some of the coastal habitats as part of their AFOLU sector. <sup>25</sup> This sectoral approach can allow countries to limit the scope of the target to one habitat type, such as mangroves and keep including the others as the country continues to have information.	<b>Sector specific GHG targets</b> Countries that have their inventories on any of the coastal habitats can include a target related to GHG emissions and/or removals.	<b>Belize:</b> “Enhance the capacity of the country’s mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO <sub>2e</sub> between 2021 and 2030 through mangrove restoration.”
		<b>Sector specific non-GHG targets</b> Countries can include non-GHG targets. These do not have a specific quantifiable emission target but allow countries to demonstrate how they plan to reach their commitments in relation to coastal wetlands through policies and actions.	<b>Bahamas:</b> “Conservation and Sustainable management practices and the establishment LULUCF of a forest estate with 20 percent land cover.”  <b>Belize:</b> “Restore at least 2,000 hectares of mangroves, including within local communities, by 2025, with an additional 2,000 hectares by 2030.” “Assess the value of seagrass habitat contributions to climate regulation to inform development and implementation of a national seagrass management policy, updated national seagrass mapping as part of an updated marine habitat map, and identification of a portfolio of priority seagrass areas for protection to enhance conservation.”

24 Belize includes an important note in its' NDC connected to this target in relation to blue carbon ecosystems: “Belize is considering management of its near-shore coastal ecosystems (fringe and island mangroves and seagrass) in an integrated and holistic way. Fringe and island mangroves account for around 30% of total mangrove cover, while the other 70% of mangroves are located on the mainland in basin and littoral formations. All mangrove formations are integrated into the Forest Reference Level within the national definition of forests. The understanding of the climate influence of Belize’s mangrove ecosystems, including both above- and below-ground carbon, is more advanced; they are estimated to currently hold total ecosystem carbon stocks of approximately 92,962,893 (92,963 Kt) tCO<sub>2e</sub>, and annually sequester around 431,644 (432 Kt) tCO<sub>2e</sub>/year. These figures will be further validated based on field research to be completed in 2021.”

25 It is recommended to include a reference to the IPCC Wetlands supplement.

Section	Sub-section	How to	Examples
<b>Information for clarity, transparency and understanding (ICTU)</b>			
<b>ICTU</b>	Quantifiable information on the reference point for blue carbon ecosystems (including, as appropriate, a base year)	<p>Countries can decide to include a base year or reference point for business-as-usual (BAU) for a specific sector in a blue carbon ecosystem if it differs from other reference points in other ecosystems.</p> <p>This can be relevant if countries update their inventories to include blue carbon ecosystems not accounted in their inventories initially.</p>	<p><b>Bahamas:</b>“The reference year for the target is 2030 and the target is expressed both as relative to a BAU scenario for that year, and relative to 2010 baseline emissions. The BAU emissions projections have been calculated based on policies in place since 2013.”</p> <p><b>Belize:</b> “Emissions projections for the FOLU sector specifically are projections based on data collected and presented in Belize’s FOLU sector GHG inventory delivered in 2019. All analyses for the FOLU sector was carried out within this database.”</p>
	Time frames and/or periods for implementation	<p>Present the implementation window. Most countries include up to 2030.</p>	<p><b>Barbados:</b>“Barbados adopts the following ambitious contributions for 2025 and 2030: 2025: 20 percent reduction relative to business-as-usual emissions in 2025 without international support (unconditional). 35 percent reduction relative to the business-as-usual emissions in 2025 conditional upon international support. 2030: 35 percent reduction relative to business-as-usual emissions in 2030 without international support (unconditional).70 percent reduction relative to business-as-usual emissions in 2030 conditional upon international support.”</p>
	Scope and coverage	<p>Describe the sectors, gases, categories and pools covered consistent with IPCC guidelines. Mitigation co-benefits resulting from Parties’ adaptation actions should be mentioned here. In terms of blue carbon ecosystems, they will be accounted in the AFOLU sector following the 2013 Wetlands Supplement.</p>	<p><b>Belize:</b>“The targets set out in this NDC include a set of mitigation actions estimated to avoid a cumulative 5.6 MTCO<sub>2</sub>e by 2030 through interventions in the AFOLU, Energy, Transport and Waste sectors, and a suite of interventions to increase resilience and adaptation in sectors central to Belize’s economy and society.”</p> <p><b>Barbados:</b> “The Roofs 2 Reefs Programme has been specifically designed to strengthen resilience and adaptation capacity, as well as make a mitigation contribution.”</p>
	Planning processes	<p>Describe the relevant planning processes, institutional arrangements, national circumstances or other contextual matters that underpin a NDC. It is a relevant section to include how blue carbon ecosystems are considered and how mitigation or adaptation actions are included.</p>	<p><b>Belize:</b> “The NDC is informed by findings from climate vulnerability assessments and reflects the specific circumstances climate change poses Belize.”</p>

Section	Sub-section	How to	Examples
ICTU	Assumptions and methodological approaches	It is recommended that parties use the 2006 IPCC guidelines for GHG inventories, and specifically the 2013 Wetlands Supplement to include blue carbon ecosystems. Inclusion of mangroves as part of forest (under AFOLU) should be clarified in this section. If parties have the intention to use voluntary cooperation under Article 6 of the Paris Agreement for blue carbon, it is important this is also included here.	<p><b>Belize:</b> “An action related to exploring carbon markets for blue carbon is included in the NDC.”</p> <p><b>Bahamas:</b> “The Bahamas has put into place a legislative and policy regime, i.e., the Climate Change and Carbon Markets Initiative Act and the Carbon Trading Act to facilitate both Article 6 and market mechanisms in the VCM, which can benefit the country in the implementation of its climate targets.”</p>
	How the parties consider the NDC to be fair and ambitious	Describe how/why the NDC is fair and ambitious including equity. This section highlights how integrating blue ecosystems is important for the country (in terms of impacts to the population from climate change as well as in terms of emissions reductions and sequestration benefits).	<p><b>Belize:</b> “Despite contributing a very small share of global emissions, Belize recognizes its potential to contribute to global climate regulation by protecting and restoring natural resources that serve as major carbon sinks, including mangrove forest, sea grass and terrestrial forests. These habitats are prioritized for protection and restoration in the actions included in this NDC.”</p>
	How the NDC contributes towards achieving the Convention’s objectives	Describe how the NDC contributes to the global objectives on climate change (Convention, Paris Agreement and decarbonization). It is a section where the inclusion and importance of blue carbon ecosystems can be highlighted.	<p><b>Belize:</b> “A set of mitigation targets in line with a global goal to keep global warming to below 2 degrees Celsius by 2100/A set of adaptation actions designed to develop resilience of critical systems and populations in Belize.”</p> <p><b>Bahamas:</b> “By reducing its contribution to global GHG emissions that are affecting the climate system and implementing actions that will reduce the country’s vulnerability and improve its ability to prepare and respond to climate change, while ensuring equitable, sustainable, and resilient growth.”</p>

Section	Sub-section	How to	Examples
<b>Implementation</b>			
<b>Implementation</b>	Institutional arrangements	Describe the governance framework to implement the actions and targets in NDCs. It is important to mention here the relevant ministries and other stakeholders that have jurisdictional power over coastal wetlands and blue economy sectors.	<b>Bahamas:</b> “In this context, the implementation of this NDC will be coordinated by the Ministry of Environment and Natural Resources’ Department of Environmental Planning and Protection (DEPP) as the country’s operational focal point for the UNFCCC, with the support from The Bahamas National Climate Change Committee (NCCC), that includes representatives from government, private and civil agencies and provides strategic level guidance on climate change related activities, policies and plans, and functions as the National Project Consultative Committee for national reporting to the UNFCCC or other climate entities. Other key actors that will facilitate the development, implementation, follow-up and monitoring of the NDC include the different national agencies, and other public and private actors.” Some of the key implementation and stakeholders institutions include: Bahamas Maritime Authority, Department of Marine Resources, University of The Bahamas, Climate Change Adaptation and Resilience Research Centre, Bahamas Protected Areas Fund, amongst others.
	Finance	Include the financial needs to implement the actions and targets of NDCs. Blue carbon market mechanisms can be referred to here as well as what type of financial support is needed. Vulnerability of coastal wetlands can be used to build a case for financial support.	<b>Belize:</b> “Belize is exceptionally vulnerable to natural disasters and climate change (...).This makes Belize a priority to receive financing support for realizing its climate actions across different sectors in their NDC.” “To support the implementation targets and activities set out later, Belize will explore the potential for new and additional financing opportunities to support mangrove protection and restoration, such as multilateral and bilateral financing, and blended financing schemes such as: private sector investments in green infrastructure, tourism, insurance, and other sectors; philanthropy; impact investing; ‘blue carbon’ credits; green/blue bonds; catastrophe bonds; among others.”
	Monitoring	Describe how the actions and targets in NDCs will be monitored and include areas of improvement in terms of data related to coastal wetlands. This includes how to monitor changes in these ecosystems.	<b>The Bahamas:</b> “The country is currently developing a Monitoring, Reporting and Verification (MRV) system to generate information on progress in the implementation of the Updated NDC, as well as information on the funding, technology transfer and capacity building support requested and received. Once implemented, this system will allow for the proper monitoring of the Updated NDC actions.”  <b>Barbados:</b> “Barbados needs additional resources and enhanced capacity building in order to be able to meet these requirements. This project will allow Barbados to receive resources to address data issues, build capacity for the development and update of greenhouse inventories, establish a robust MRV systems, enhance collaboration between Ministries, agencies and the private sector, and improve knowledge in transparency and the Paris Agreement.”

# 3. Areas of opportunities for LAC SIDS

## 3.1 Marine and coastal resources in LAC SIDS' economies

SIDS are often referred to as “large ocean states”, considering that the extent of oceans under their control –known as a country’s Exclusive Economic Zone (EEZ)- is generally much larger than their land mass. This makes SIDS highly dependent on healthy marine ecosystems, for community’s livelihoods and national economies. Factors such as small population size, remoteness from international markets and high importation costs, means that SIDS are extremely vulnerable to economic shocks. Considering the limited economic options available to SIDS, consequences from biodiversity loss and climate change have disproportionate effects on SIDS wellbeing and future development.

The 16 SIDS in LAC<sup>26</sup> (Figure 4) are no exception and rely heavily on their marine and coastal assets for national economic growth and to sustain livelihoods, through fisheries, tourism, and shipping. Notably, the Caribbean Sea accounts for 14 to 27 percent of the global ocean economy.<sup>27</sup> Tourism, plays a major role in the region, with the sector accounting for over 15 percent of GDP and 13 percent of jobs.<sup>28</sup> After the pandemic, the tourism sector had a strong recovery and its contribution to GDP grew by 36.6 percent,<sup>29</sup> contributing over \$39 billion to GDP in 2021.<sup>30</sup> The Caribbean’s cruise industry alone accounts for 50 percent of the global cruise market share of vessel calls and passengers.<sup>31</sup> The fisheries sector, in the wider Caribbean, earns close to \$5 billion annually.<sup>32</sup> Small-scale fisheries in the Caribbean provide livelihoods, food security and employment in the region, representing over 90 percent of catches.<sup>33</sup> It is estimated that more than 900,000 people are employed directly in capture fisheries in the wider Caribbean, with another 3 million jobs in ancillary activities such as processing, net making and boat building.<sup>34</sup> When considering the shipping sector, this contributes to over 75 percent of the region’s annual gross revenues.<sup>35</sup> These figures confirm the significance of maintaining healthy oceans and coastlines for LAC SIDS’ economies.

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26 This publication considers the following countries when referring to LAC SIDS (in alphabetical order): Antigua & Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Kitts & Nevis, Saint Lucia, St. Vincent & the Grenadines, Suriname, Trinidad & Tobago. This report does not account for the overseas territories and associated states islands with a special status in the Caribbean.

27 Patil et al. (2016).

28 World Travel and Tourism Council. (2021).

29 World Travel and Tourism Council. (2022).

30 Statista, 2021 data.

31 Caribbean Development Bank. (2018).

32 Patil et al. (2016).

33 Tambutti M et al. (2020).

34 CLME+ SAP. (2013).

35 Patil et al. (2016).



Figure 4. Map of LAC SIDS



## 3.2 Blue carbon ecosystem coverage in LAC SIDS

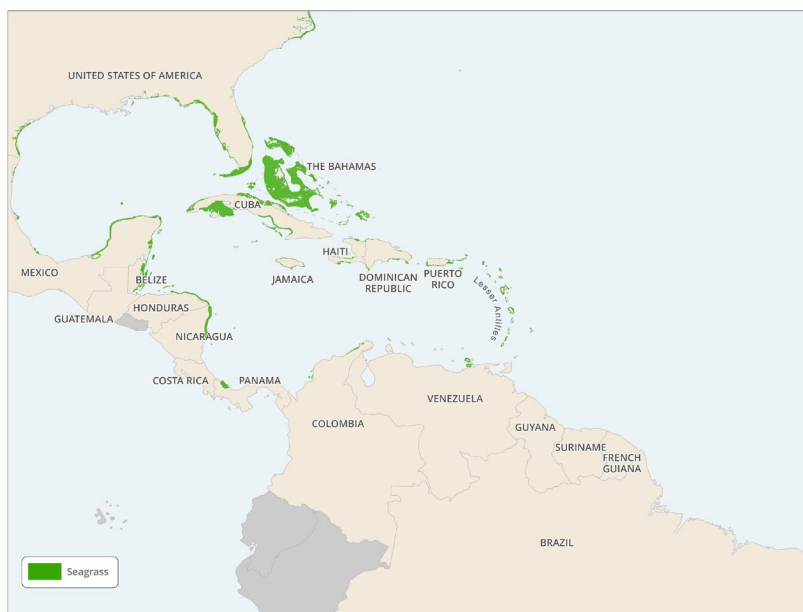
In terms of coverage of blue carbon ecosystems, mangroves and seagrasses in LAC SIDS cover over 3,130,402 hectares (for information presented by country please see Annex I & II). Coral reefs, mangroves and seagrass beds are found across LAC SIDS and host significant species diversity, including endemic and threatened species, as well as commercially valuable species. These ecosystems have provided benefits to local inhabitants not only in the form employment, but also in terms of food supply, clean water, reduced beach erosion, soil and sand formation, and protection from storm surges. Figures 5 and 6 illustrate the extent of mangrove and seagrass in the Caribbean Large Marine Ecosystem.

**Figure 5: Extent of mangroves in the Caribbean Large Marine Ecosystem**



Source: [Caribbean Marine Atlas](#). (2020).

**Figure 6: Extent of seagrass in the Caribbean Large Marine Ecosystem**



Source: [Caribbean Marine Atlas](#). (2020).

### 3.3 Status of LAC SIDS efforts to integrate blue carbon and blue economy in climate policy and action

Positioning marine and coastal ecosystems within the greater blue economy concept in NDCs and other national policy and planning frameworks is especially important for LAC SIDS noting their high dependency on ocean resources. There is considerable evidence that LAC SIDS are taking action towards the transition to a sustainable blue economy. This includes the implementation of initiatives aimed at protecting, restoring, and sustainably managing marine and coastal resources, efforts to increase the adaptation potential of coastal communities and increasingly considering oceans as part of the solution to climate change. When countries add blue carbon and other ocean-related actions as part of their national climate framework, including in NDCs, this demonstrates the importance of marine and coastal resources to climate action and can be an entry point to leverage climate financing to help protect and restore marine ecosystems and biodiversity.

Not surprisingly, several SIDS in LAC have developed strategies on the blue economy and are using those frameworks to give rise to new financial mechanisms supporting investments in the blue space. The heightened interest for offsetting carbon emissions and the potential of blue carbon to produce economic returns has seen the demand for blue carbon credits soar worldwide<sup>36</sup>. While the level of progress to advance blue carbon initiatives varies across the region, many countries are moving forward to strengthen their capacity in blue carbon.

For example, many LAC SIDS have started to create an enabling policy and regulatory environment to facilitate blue carbon initiatives. In 2022 **The Bahamas** adopted a [Climate Change and Carbon Markets Initiatives Bill](#) and **Belize** announced that it would develop a regulatory framework for blue carbon projects.<sup>37</sup> **Guyana** and **Suriname** have developed mangrove management strategies, while other countries, integrate mangrove conservation and restoration policies as part of their coastal management plans (**Puerto Rico**) or their climate change policy. For example, in **Grenada**, the National Climate Change Policy and the 5-year (2017–2021) National Adaptation Plan (NAP) contains a commitment to protect 20 percent of Grenada’s coastal ecosystems by 2021, including protection measures for mangrove and seagrass. Moreover, various countries (see Table 2) joined important international conventions such as the Ramsar Convention, which commits to conserve and a sustainable use of wetlands.<sup>38</sup> Commitments to the Ramsar Convention provide an entry point to elevate and prioritise actions in the blue economy and surrounding blue carbon markets.

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<sup>36</sup> Friess, D, et al. (2022).

<sup>37</sup> The Nature Conservancy (TNC). (2021).

<sup>38</sup> The Convention uses a broad definition of wetlands. It includes all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans.

**Table 2: LAC SIDS that are Parties to the Ramsar Convention<sup>39</sup>**

Country name	Year entered into Convention	# of Ramsar sites in country
<b>Antigua and Barbuda</b>	2005	1
<b>Bahamas</b>	1997	1
<b>Barbados</b>	2006	1
<b>Belize</b>	1998	2
<b>Cuba</b>	2001	6
<b>Dominican Republic</b>	2002	6
<b>Grenada</b>	2012	1
<b>Jamaica</b>	1998	4
<b>Saint Lucia</b>	2002	2
<b>Suriname</b>	1985	1
<b>Trinidad and Tobago</b>	1993	3

In addition, some LAC SIDS have started to conduct blue carbon stock assessments that cover a part of their coastal ecosystems. Most of the studies have focused on quantifying carbon stored in mangroves while a few others focus on carbon assessments of seagrass meadows. This important step signals that LAC SIDS governments are taking concrete steps to explore how blue carbon ecosystems can contribute to conservation while also providing market value. In **Belize** the first national estimate of mangrove carbon stocks was introduced while an initiative funded by the British High Commission is providing the first measurements in mangrove carbon stocks in **Guyana, Suriname** and **Trinidad and Tobago**.

Besides these regulatory and political framework efforts, concrete climate action is also being implemented in LAC SIDS. According to data from the Inter-American Development Bank and World Resources Institute, although the level of NbS in LAC SIDS varies, at least 33 NbS projects are being developed in 15 countries.<sup>40</sup> Many NbS solutions examined in LAC SIDS focus on building coastal resilience through investments in coastal protection and applying ecosystem-based adaptation measures such as mangrove forest and coral reef restoration. For example, in **Haiti**, through a World Bank initiative, NbS are being applied to improve the resiliency of the transportation sector by improving coastal roads highly exposed to climate impacts. This will be achieved by the placement of willow spilling revetment and planting vetiver as a slope stabilizer for the mountain side, and mangrove restoration to protect the coastal slope.<sup>41</sup> Figure 7 highlights some key projects and initiatives in the region in which blue economy has been considered.

<sup>39</sup> See **RAMSAR** for more information.

<sup>40</sup> Oliver, E., et al. (2021).

<sup>41</sup> Becoulet et al. (2021).

Figure 7. Blue economy and blue carbon projects and initiatives in the LAC region

Cuba

### NATURE-BASED SOLUTIONS

The UNDP/GCF financed project '**Coastal Resilience to Climate Change in Cuba, 'Mi Costa'** applies nature-based solutions to increase coastal resilience and capacity for climate change adaptation in protected areas of Cuba.

The Bahamas, Dominican Republic, Grenada, St. Lucia, and St. Vincent and Grenadines

### CARBON CREDITS

UNEP/Green Environment Facility (GEF) Caribbean **BLuEFin Project**, is implemented in The Bahamas, Dominican Republic, Grenada, St. Lucia, and St. Vincent and Grenadines aims to establish a Blue Carbon Facility that will support conservation objectives of blue carbon ecosystems through the sale of carbon credits to investors seeking to offset their environmental impacts.

Dominican Republic

### NAMA

The Dominican Republic, in 2015, developed a **Nationally Appropriate Mitigation Action (NAMA)** with the primary goal of restoring and conserving mangroves.

Colombia<sup>42</sup>

### BLUE CARBON

First blue carbon project registered in Verra in the Gulf of Morrosquillo, **Colombia**. It is estimated that almost one million tons of CO<sub>2</sub> will be sequestered over 30 years by conserving and sustainably managing 7,561 hectares of coastal mangrove ecosystem, marshes, and associated streams.

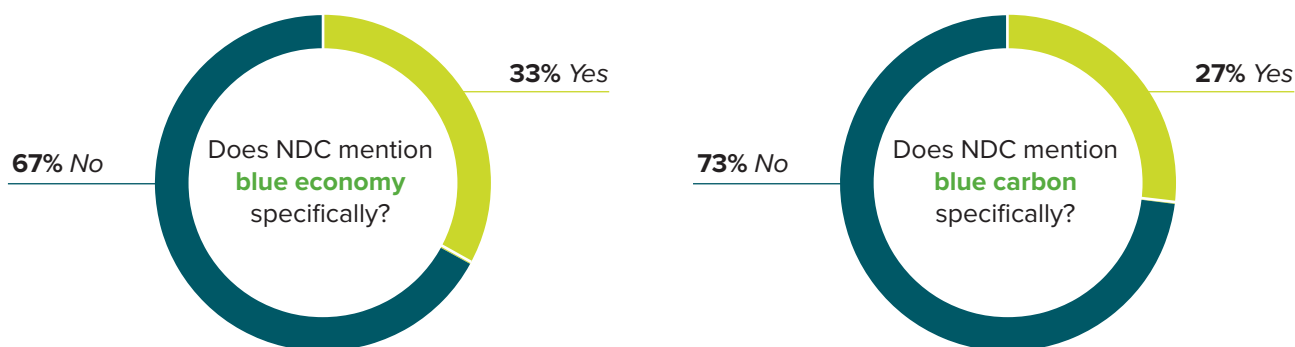
42 Although not a LAC SIDS, an example from Colombia has been included because it represents the first verified blue carbon project in the region and can serve as best practice for other countries.

These initiatives provide ideas and examples of how to promote coastal based nature based solutions, blue economy and blue carbon activities for climate action that will support an effective framework to increase the conservation and protection of marine and coastal ecosystems.

Encouragingly, the integration of “blue” concepts around climate targets has been increasing. While several countries made reference to coastal wetlands in their first round of NDCs, only a minority discussed ocean actions as climate solutions.<sup>43</sup> As oceans have taken more importance in climate negotiations this has contributed to better inclusion of ocean and marine actions in enhanced NDCs as more countries recognize the linkages between oceans and climate change. With the exception of **Belize**, whose enhanced NDC commits to do so by 2025, no LAC SIDS have included blue carbon in their national GHG inventories. Nevertheless, countries across the region are taking commendable steps to elevate ocean, marine and coastal action in their enhanced NDCs.

Analysis carried out for this report that reviewed the enhanced NDCs of 16 LAC SIDS, found that almost all LAC SIDS, 94 percent, spoke to blue economy themes.<sup>44</sup> Of these, five NDCs (**Antigua and Barbuda**, The **Bahamas**, **Belize**, **Barbados** and **Dominica**), directly refer to the “blue economy” in their NDCs. When looking at “blue carbon” references, only four countries (The **Bahamas**, **Barbados**, **Belize** and **Dominican Republic**) directly speak to this.

**Figure 8. References to blue economy and blue carbon in enhanced NDCs of LAC SIDS (%)**



Source: UNDP internal analysis, 2023.

In the section of NDCs where countries speak to their country context, only **Belize’s** enhanced NDC speaks specifically to blue economy. However, in country context descriptions, all LAC SIDS acknowledge the vulnerability of coastal areas to the effects of climate change, including but not limited to sea level rise, changes in rainfall and flooding, storms, coastal erosion and loss of coastal habitats. When looking at the role of marine and coastal resources to economies, 60 percent of enhanced NDCs note that they are central to their economy.

<sup>43</sup> Martin et al. (2016).

<sup>44</sup> The following blue economy-related terms were searched in NDCs: blue economy; blue carbon; ocean resources; marine ecosystem; marine resources; coastal resources; coastal/water/oceans/marine nature-based solutions; coastal wetlands; mangroves, seagrass, coral reefs, beaches, coastal resilience.

It should be noted that the blue economy is not presented as a high strategic vision or pillar in any of the LAC SIDS enhanced NDCs reviewed, but rather, it is largely discussed in terms of actions and targets as well as the surrounding policy environment. In the case of **Cuba**, no mention is made on blue economies nor blue carbon however, the role of protecting coastal and marine systems as nature based solutions for adaptation is referenced.

Regarding the later, 69 percent of enhanced LAC SIDS NDCs link blue economy-related themes to the policy environment. Common policies, plans and strategies where this takes place include: national development plans; climate change policy, strategy, and action plans; NAPs (and sectoral NAPs); marine and terrestrial adaptation plans; coastal zone/wetland-related policies and acts; regulations aimed at protecting forests/mangroves; Integrated Coastal Zone Management (ICZM) plans; master plans for national protected areas; water protection and land use policies; and national physical development Plans. Box 5 provides examples of policy related to blue economy mentioned in NDCs.

### **Box 5: Coastal NbS and blue economy related policy examples referenced in LAC SIDS enhanced NDCS**

#### **Cuba - State Plan to Confront Climate Change “Tarea Vida” (2017)**

“Including measures for coastal protection of cities, integral recovery of beaches, mangroves and other natural protective ecosystems, hydraulic and coastal engineering works, among others.”

#### **Belize - Forests (Protection of Mangroves) Regulations (2018)**

“Established a permitting system that aims to safeguard mangroves and their many ecosystem services from deforestation and degradation.”

#### **The Bahamas - Master Plan for The Bahamas National Protected Area System (2012)**

“Through this Master Plan the Government of The Bahamas has identified targets for expanding protected areas for terrestrial and marine ecosystems in order to meet its obligations under the Convention on Biological Diversity (CBD).”

Source: [Cuba](#), [Belize](#) (2021), [The Bahamas](#), Enhanced NDCs.

From a governance and coordination perspective, NDCs highlight, to varying degrees, that public authorities and stakeholders such as research institutes, academia, private sector and NGOs participate in blue economy efforts. For example, **Antigua and Barbuda** and **Barbados** have official blue economy governance bodies through the Ministry of Social Transformation and the Blue Economy, and the Maritime Affairs and the Blue Economy, which are mentioned in their NDCs, respectively. However, only a few stakeholder engagement mechanisms in relation to blue economy appear as prominent. One significant example would be the Blue Carbon Working Group for **Belize** which represents a diversity of NGOs, academic institutions and policy circles. The Working Group is established to contribute technical inputs and strengthen the efforts for the protection of Belize’s coastal ecosystems through updated NDCs as well as other relevant policies, strategies and regulatory instruments (see Box 6).

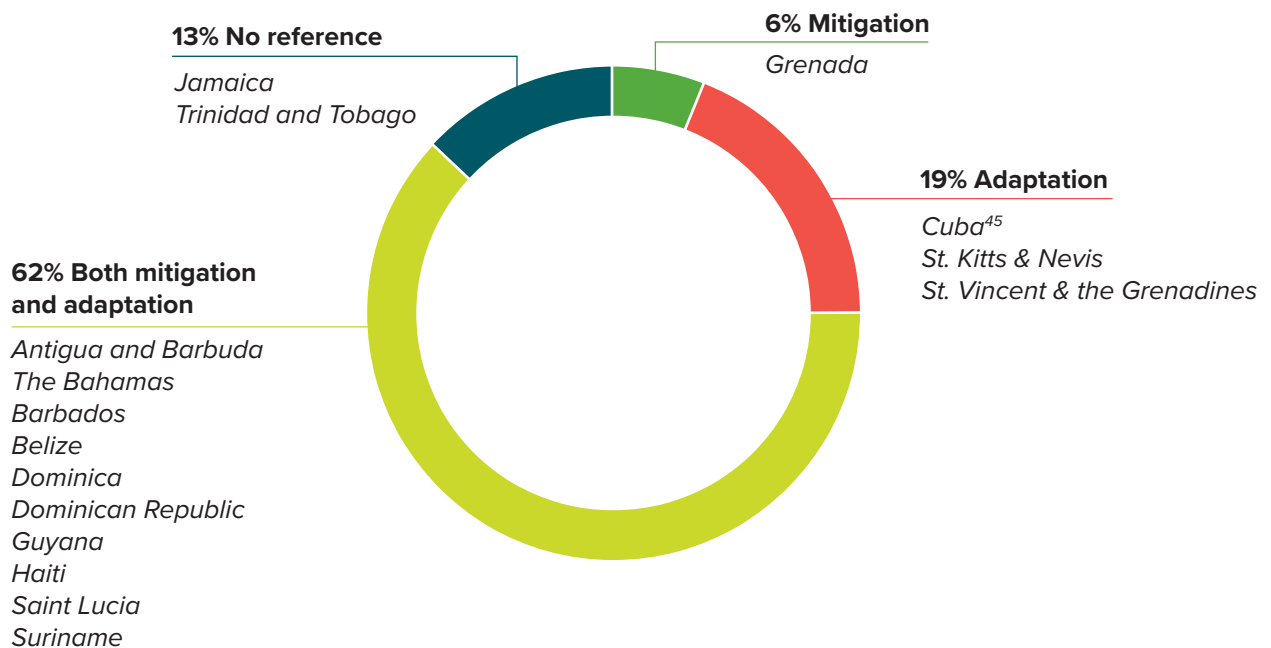
## Box 6: Blue economy stakeholder engagement in Belize’s enhanced NDC

“In 2020, the NCCO [Belize National Climate Change Office], in collaboration with the World Wildlife Fund and partners, convened the first Blue Carbon Working Group for Belize. The Working Group includes representatives from across government agencies, academia, civil society, communities, and other key stakeholders, and was formed to value the blue carbon potential and adaptation co-benefits of Belize’s coastal ecosystems, in order to inform targets and recommendations to strengthen their protection and effective management over the long-term. Targets and recommendations derived from the Working Group will be integrated within the policies and plans referenced above, including planned updates to the ICZM Plan, the NBSAP, the National Climate Change Policy Strategy and Action Plan, and the Forests (Protection of Mangroves) Regulations.”

Source: Belize, Enhanced NDC (2021).

When comparing references to blue economy in the NDCs adaptation component, mitigation component, or both, encouragingly more than half of countries (62 percent) speak to these themes as a part of both mitigation and adaptation, while 6 percent only relate to mitigation and 19 percent only relate to adaptation (Figure 9). Two countries, Jamaica and Trinidad and Tobago, did not speak to these themes in reference to either adaptation or mitigation.

**Figure 9: Blue economy in adaptation vs. mitigation components of LAC SIDS' enhanced NDCs**



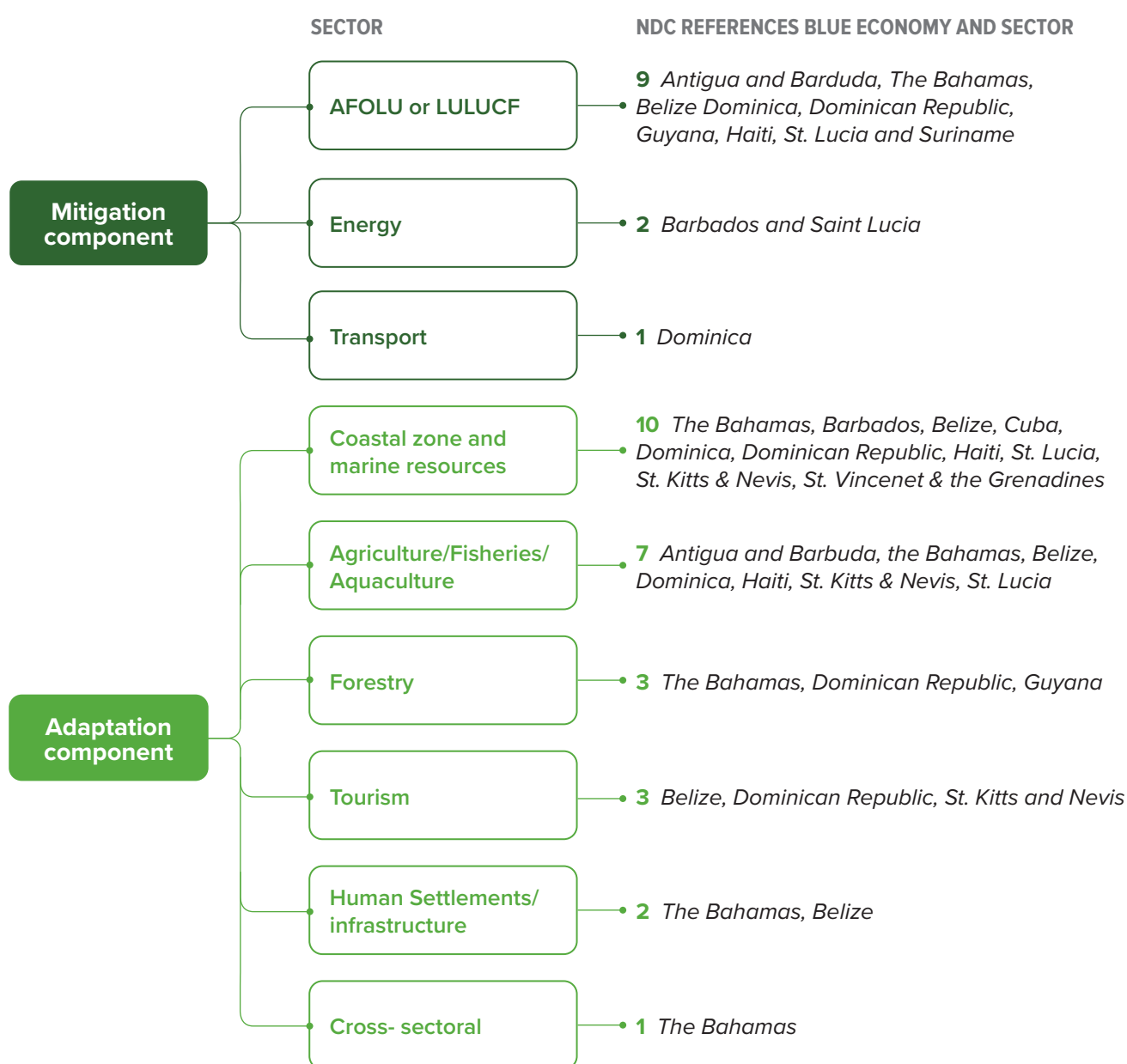
45 Cuba’s NDCs makes mention of nature-based solutions for the protection of coastal areas and resources, however no specific mention is made towards blue carbon or blue economies.



For countries that link blue economy themes to sectors under the mitigation component of their NDCs, three sectors feature: Energy, AFOLU or LULUCF<sup>46</sup> and Transport. Six NDCs do not reference blue economy themes in mitigation sectors (Cuba, Grenada, Jamaica, St. Kitts and Nevis, St. Vincent and the Grenadines and Trinidad and Tobago) (Figure 10).

When looking at adaptation sectors, there were six main sectors that spoke to blue economy themes. These include coastal zone and marine resources (includes sector categories such as coastal resilience, coastal zone management, ocean resources, water resources, marine resources); agriculture/ fisheries/aquaculture; forestry; tourism, human settlements/ infrastructure and cross-sectoral. Three NDCs did not reference blue economy themes and adaptation sectors (Grenada, Jamaica, Trinidad and Tobago) (Figure 10).

**Figure 10. Sectors linked to blue economy themes in LAC SIDS' enhanced NDCs**



<sup>46</sup> As NDCs reviewed have used different IPCC guidelines for calculating emissions in terms of the land-use and forestry sector, some refer to it as the LULUCF sector as per the 2003 IPCC guidelines, while others include Agriculture and refer to it as the AFOLU sector as per the 2006 IPCC guidelines. We have included both sectors in the analysis noting the terminology used by the country.

More concretely, for the 15 LAC SIDS NDCs that reference blue economy themes, 8 include blue economy related targets and 14 include blue economy related actions (Table 3).

**Table 3. Coastal-based NbS, blue economy and associated targets and actions in LAC SIDS' enhanced NDCs**

In mitigation or adaptation	Country name	Sector	Example of target/action from enhanced NDC	Indicator included
<b>In targets</b>				
<b>Mitigation</b>	Antigua and Barbuda	AFOLU	All remaining wetlands, watershed areas, and seagrass bed areas with carbon sequestration potential are protected as carbon sinks (Completion Date: 2030)	—
<b>Mitigation</b>	The Bahamas	LULUCF	Reestablishment and rehabilitation of 50ha of Davis Creek, Andros Ecosystem: The estimated GHG emission reduction is 14.563 GgCO <sub>2</sub> -eq.	Yes
<b>Mitigation</b>	Belize	LULUCF	Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO <sub>2</sub> e between 2021 and 2030 through mangrove restoration.	—
<b>Mitigation</b>	Dominica	Transport	Dominica has set a target for 100% emissions reduction in the shipping sub-sector by 2030.	—
<b>Mitigation</b>	Guyana	AFOLU	Conservation of an additional 2 million hectares through Guyana's National Protected Area System and other effective area. Existing mangrove forests will be counted in this target.	—
<b>Mitigation</b>	Haiti	AFOLU	Restoration of mangrove forests: 1000 ha of regenerated (over the period 2020-2030)	Yes
<b>Mitigation</b>	Suriname	AFOLU	In accordance with the Government of Suriname 2015 NDC unconditional contribution, Suriname has established 14% of its total land area under a national protection system and will continue to pursue the expansion of this system by increasing the percentage of forests and wetlands under protection to at least 17% of the terrestrial area by 2030.	—
<b>Adaptation</b>	St. Vincent and the Grenadines	Coastal Zone and Marine Resources	The country has started to promote itself as a dive destination and has signed on to the Caribbean Challenge Initiative (CCI) with the pledge to protect 20% of its near shore marine and coastal resources by 2020.	—

In mitigation or adaptation	Country name	Sector	Example of target/action from enhanced NDC	Indicator included
<b>In actions</b>				
<b>Mitigation</b>	Belize	LULUCF	<ul style="list-style-type: none"> <li>Building on the 12,827 hectares of mangroves currently under protection, protect at least a further 6,000 hectares of mangroves by 2025, with an additional 6,000 hectares by 2030.</li> <li>Restore at least 2,000 hectares of mangroves, including within local communities, by 2025, with an additional 2,000 hectares by 2030</li> <li>Halt and reverse net mangrove loss by 2025 through public measures and partnerships with private landowners local communities, and other relevant stakeholders</li> <li>Complete an in-situ assessment of the below ground carbon stock of mangroves by 2022, leading to the application of relevant IPCC methodologies to assess the feasibility of including seagrass in a wetlands component, alongside a comprehensive assessment of mangrove-based carbon stock, in the National Greenhouse Gas Inventory, and other relevant reports by 2025.</li> </ul>	—
<b>Mitigation</b>	Haiti	AFOLU	Restoration of 1000 ha of mangrove forests	
<b>Mitigation</b>	Suriname	AFOLU	Strengthening coastal protection through nature-based solutions, such as mangrove planting, which beyond improved resilience brings significant co-benefits in the form of carbon sequestration and enhanced food security.	—
<b>Adaptation</b>	Antigua and Barbuda	Fisheries and Aquaculture	Work with farmers and fisherfolk to build the resilience of their livelihood activities to extreme events, including exploring options for renewable energy and land/ocean management frameworks.	—
<b>Adaptation</b>	The Bahamas	Water Resources (Coastal Zone and Marine Resources), Forestry	<ul style="list-style-type: none"> <li>Promote Nature-Based Solutions (NbS) approaches to sustain ecosystems that ensure resilience against climate-related threats (ex. coral reef and mangrove) involving local communities.</li> <li>Develop ecological and economic analysis to increase knowledge on the value of forest, mangrove, coral reef and sea grass ecosystems.</li> <li>Enhance protection and restoration of damaged/degraded ecosystems (e.g., terrestrial forests, mangroves, coral reefs)</li> </ul>	—
<b>Adaptation</b>	Barbados	Coastal Zone and Marine Resources	Under adaptation and resilience, the Roofs 2 Reefs Programme includes an action to restore vulnerable coral reef ecosystems, particularly on the west and south coasts of the island.	—

In mitigation or adaptation	Country name	Sector	Example of target/action from enhanced NDC	Indicator included
<b>Adaptation</b>	Cuba	Coastal Zone and Marine Resources,	<ul style="list-style-type: none"> <li>• Halt the deterioration, rehabilitate and conserve coral reefs throughout the archipelago, with priority on the ridges that border the island platform and protect urbanized beaches for tourist use. Avoid overfishing of fish that favor corals.</li> <li>• Conserve, maintain and fully recover the sandy beaches of the Cuban archipelago, prioritizing the urbanized ones for tourist use and reducing the structural vulnerability of the built heritage.</li> <li>• Direct reforestation towards maximum protection of soils and waters in quantity and quality; as well as the recovery of the most affected mangroves.</li> </ul>	—
<b>Adaptation</b>	Dominica	Agriculture; Fisheries and Aquaculture	<ul style="list-style-type: none"> <li>• Establishment of an Integrated Coastal and Watershed Management Plan and supporting institutional framework</li> <li>• Marine space under protection and management</li> </ul>	Yes
<b>Adaptation</b>	Dominican Republic	Coastal Zone and Marine Resources	<ul style="list-style-type: none"> <li>• Establishment of an Integrated Coastal and Watershed Management Plan and supporting institutional framework</li> <li>• Marine space under protection and management</li> <li>• Zoning and planning of coastal-marine systems taking into account adaptation and resilience to climate change</li> <li>• Prevention, mitigation and remediation of pollution of the coasts and beaches with special attention to compliance and inspection to reduce the vulnerability and increase the resilience of coastal / marine systems.</li> <li>• Promote the production of marine data, products and metadata to make more available to public and private users who depend on marine data, standardized and harmonized with quality assurance.</li> <li>• Manage a fund for the recovery of mangroves, estuaries and coral reefs and other coastal-marine ecosystems and species, which contributes to increasing resilience to the effects of climate change and variability.</li> </ul>	Yes
<b>Adaptation</b>	Dominican Republic	Tourism	<ul style="list-style-type: none"> <li>• Determine and establish the carrying capacity of coastal-marine ecosystems or their limit of acceptable change for recreational uses according to their adaptation to climate change.</li> <li>• Maintenance and restoration of coastal marine ecosystems (mangroves, reefs, dunes).</li> </ul>	
<b>Adaptation</b>	Guyana	Forestry	Conditional contribution to adaptation includes mangrove restoration	—

In mitigation or adaptation	Country name	Sector	Example of target/action from enhanced NDC	Indicator included
<b>Adaptation</b>	Haiti	Fisheries, Coastal Zone	<ul style="list-style-type: none"> <li>Restoration (regeneration) and maintenance of mangrove ecosystems</li> <li>Protection of coral reefs and seagrasses</li> <li>Education relating to the protection of the coastline and the marine environment</li> <li>Ban on the construction of facilities vulnerable to coastal hazards</li> </ul>	Yes
<b>Adaptation</b>	St. Lucia	Coastal Zone and Marine Resources (resilient marine ecosystem)	<ul style="list-style-type: none"> <li>Establishing the basis for improving beach management and coastal erosion control under changing climate conditions in Saint Lucia.</li> <li>Evaluation of shoreline stabilisation technologies in selected vulnerable coastal areas in Saint Lucia.</li> <li>Solving the die-back of the largest mangrove in Saint Lucia to strengthen the country's climate resilience.</li> </ul>	—
<b>Adaptation</b>	St. Lucia	Fisheries	Increasing the capacity of fishers and other actors to manage climate risks through improved data management and Early Warning Systems (EWS).	
<b>Adaptation</b>	St. Kitts & Nevis	Coastal Zone and Marine Resources	Establishment of a Coastal Zone Management Unit Integration of climate change, ecosystem-based adaptation and disaster risk reduction into legislation, regulations and policies	—
<b>Adaptation</b>	St. Kitts and Nevis	Tourism	Conduct beach replenishment and install coastal protection measures to prevent beach erosion	
<b>Adaptation</b>	St. Vincent and the Grenadines	Coastal Zone and Marine Resources	Reducing climate change induced risks for the population through coastal protection through various initiatives including the Sans Souci Coastal Defence Project; At the Water's Edge (AWE); Coastal Protection for Climate Change Adaptation in the Small Island States in the Caribbean 2014-2018 project.	—

It is worth noting that the **Dominican Republic** is promoting the implementation of actions set out in its Gender and Climate Change Action Plan of the Dominican Republic (PAGCC-RD)] in nine priority areas, including coastal marine, tourism and water in its enhanced NDC.

Four countries, the **Bahamas, Dominica, Dominican Republic** and **Haiti** include relevant indicators to their targets or actions related to blue economy. When looking at references to transparency and blue economy more broadly six countries make this link: **Belize, the Bahamas, Barbados, Dominica, Haiti** and **Jamaica**.

A relevant example from **Barbados's** enhanced NDC notes “there is a need for the establishment of internationally agreed accounting methodologies for mangroves, coral reefs, seagrass beds and the open ocean. Barbados's coastal and marine ecosystems are instrumental in sequestering CO<sub>2</sub> from the atmosphere. Current IPCC methodologies do not account for “blue carbon”, despite the fact that coastal ocean ecosystems in particular play an important global role in carbon sequestration. It is estimated that of all biological carbon captured, more than half (55 percent) is captured by marine organisms.”



Another example comes from **Belize's** enhanced NDC, which expresses its intention to complete “an in-situ assessment of the below ground carbon stock of mangroves by 2022, leading to the application of relevant IPCC methodologies to assess the feasibility of including seagrass in a wetlands component, alongside a comprehensive assessment of mangrove-based carbon stock, in the National Greenhouse Gas Inventory, and other relevant reports by 2025.”

These examples show that some countries are taking steps to strengthen their data and methodological approaches. Nonetheless, 60 percent of LAC SIDS enhanced NDCs do not link blue economy themes to transparency, which signals this as an area for improvement and strengthening in future NDC revision cycles.

Finally, the analysis looked at if finance and investment mobilization was being linked to blue economy themes and found that 69 percent of NDCs made this connection. There are clear examples where governments are seeking to develop and/or leverage innovative financial mechanisms or tools to support the implementation of blue economy targets and actions included in their NDCs. They include:

- ResilienSEA Economy Investment Fund of **Dominica** seeks to support the development of viable and sustainable businesses based on or linked to Dominica's rich marine environment. The Fund aims to tap private and social sector investment, steering it towards commercial or quasi-commercial ventures that support the overall climate resilience ambitions of the Government. Managed by a dedicated, objective and credible Investment Committee with experience in high-impact investing in the blue economy, it targets to provide social, environmental and financial returns (that is, a triple bottom line) to meet the expectations of a range of investors. It is aimed to be complemented by a technical assistance fund to support the development or expansion of innovative business in the sector.
- **Barbados** expressed in its enhanced NDC that sustainable (blue and green) finance should be integrated into the core adaptation and loss and damage financial package for the protection and enhancement of natural capital and preservation of threatened resource endowment.

The various ways in which LAC SIDS are integrating blue economy themes into their NDCs is a clear sign of countries recognizing the importance to institutionalize in their public policy frameworks and support climate action surrounding the blue economy and its associated sectors. While only four and five countries speak directly to blue carbon and blue economy, respectively, the inclusion of related themes illustrates that marine and coastal resources are increasingly to be part of LAC SIDS climate solutions.

### 3.4 Opportunities to strengthen blue carbon initiatives in LAC SIDS

Sustainably developing ocean spaces for economic growth and development while maintaining (or in fact, improving) ocean health can define a new era of economic opportunity for LAC SIDS. Considering that ocean habitats have the potential to sequester CO<sub>2</sub> from the

atmosphere at rates up to four times higher than terrestrial forests<sup>47</sup> while at the same time, can support adaptation and risk reduction efforts, makes marine and coastal ecosystems one of the greatest assets for LAC SIDS. Through the blue economy concept, SIDS in LAC have the opportunity to promote economic growth, social inclusion, and preserve or improve livelihoods while at the same time ensure the environmental sustainability of oceans and coastal areas.

As noted above, while LAC SIDS are increasingly including concrete ocean, blue carbon, and blue economy activities in NDCs, a major opportunity still exists to expand and scale-up these actions. In doing so, countries will be recognizing the role of marine and coastal ecosystems in achieving NDC emission reduction targets and adaptation goals and importantly, trigger financing support. It is expected that funding for blue carbon initiatives will increase in the next few years, with many projects already in the pipeline for approval.

The viability for developing blue carbon projects will depend on a set of enabling factors as discussed in Section 2.1. Table 9 below summarizes some of those these factors that identify in LAC SIDS where the inclusion of blue carbon in NDCs may be more feasible.

**Table 4: Factors to support including blue carbon in NDCs in LAC SIDS**

Country	Experience with NbS	Marine/coastal-based actions in enhanced NDC	Mangrove habitat extent (ha) <sup>a</sup>	Mangroves found in protected areas (ha) <sup>b</sup>	Seagrass habitat extent (ha) <sup>c</sup>
Antigua and Barbuda	Y	Y	869	410	24,963
Bahamas	Y	Y	154,121	96,881	226,116
Barbados	Y	Y	11	0	8,962
Belize	Y	Y	52,869	15,868	490,129
Cuba	Y	Y	359,694	181,950	1,401,505
Dominica	Y	Y	1	1	51,691
Dominican Republic	Y	Y	19,184	15,413	35,669
Grenada	Y	N	193	63	1,022
Guyana	Y	Y	28,859	14,353	0
Haiti	Y	Y	15,401	6,649	74,863
Jamaica	Y	N	9,945	7,353	79,169
Saint Kitts and Nevis		Y	35	19	6,008
Saint Lucia	Y	Y	162	104	661
Saint Vincent and the Grenadines	Y	Y	33	21	0
Suriname	Y	Y	80,044	56,980	0
Trinidad and Tobago	Y	N	8,223	1,977	0

a&b Data from: [Global Mangrove Watch](#), (2020).

c Data from: UNEP-WCMC, Short FT (2021). [Global distribution of seagrasses \(version 7.1\)](#).

<sup>47</sup> United Nations. (2023).



According to this data, **Cuba**, the **Bahamas**, **Belize** and **Suriname** have the largest mangrove extensions. More specifically, in terms of mangrove protection, **Suriname**, the **Bahamas** and **Cuba** have included more than 50 percent of their mangrove habitat extension in protected areas (71 percent, 63 percent and 51 percent, respectively) with **Belize** including 30 percent of mangroves in protected areas. This scenario already presents as a good area of opportunity for these countries, some which are already making interesting progress.

For example, **Belize**, in 2021, announced that it would develop a regulatory framework for coastal blue carbon projects. The country became the first country in the Americas to finalize a debt conversion for ocean conservation which represents an impact investment for marine protection that's unprecedented in scale. Through this debt conversion, Belize has committed to invest \$180 million into the conservation of its marine ecosystems over the next two decades – this will include the protection of 30 percent of its ocean territory.<sup>48</sup> Similarly, **Suriname**, has worked on a multi-national process for Integrated Coastal Management in the North Brazil Shelf Large Marine Ecosystem, under the NbS Mangrove Project, which supported the development of technical and institutional capacity for the protection and restoration of mangroves. A series of studies and technical outputs were produced, including a blue carbon feasibility study and a coastal vulnerability and adaptation framework in support of the development of NBS. Suriname also has a National Mangrove Strategy (2019) that provides technical advice to the Government of Suriname for the sustainable management and conservation of mangroves.

With respect to NbS, almost all countries have some experience with the implementation of coastal and marine NBS and have included reference to “blue” NbS in their enhanced NDCs. For example, **Barbados** included an action to “implement a new Water Protection and Land Use Policy (2020) designed to help protect groundwater aquifers, coastal coral reefs, mangroves and seagrass beds, with particular focus on reduction of nutrient loads into coastal waters using nature-based solutions.”

Besides these examples, other enabling environment frameworks are key to make the inclusion of blue carbon a reality. The **Bahamas** recently adopted a Climate Change and Carbon Markets Initiatives Bill in 2022 enabling the establishment of a carbon market in the Bahamas. The Bill is meant to encourage the engagement of the Bahamas with high carbon-emitting countries and companies and ensure that the financial benefits arising from the trade in carbon credits be well-regulated and in alignment with best practices. This financial mechanism will allow the country to expand the scope of their projects and targets.

It is important to highlight that while all blue carbon ecosystems are known to sequester large amounts of GHGs, blue carbon initiatives have focused mainly on mangroves and saltmarshes, and only a few proof-of-concept projects have been developed for seagrasses.<sup>49</sup> Thus, there is an area of opportunity to keep exploring this marine ecosystem. As Table 4 shows for seagrasses, **Cuba**, **Belize**, the **Bahamas** and **Jamaica** have the largest extensions in their EEZ. The significant scope of seagrass coverage in their territories presents an excellent area of opportunity in which more projects and initiatives could be developed.

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48 The Nature Conservancy (TNC). (2021).

49 Jones, N. (2021).



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In fact, Cuba’s seagrass habitats cover close to 1.5 million hectares and although Cuba does not have a specific policy framework for blue carbon conservation and restoration, the country is actively working towards improving climate resiliency through a series of initiatives focused on protecting important coastal and marine ecosystems that could provide blue carbon benefits including a portion of their seagrasses. The GCF/UNDP “Mi Costa” Project has an objective to restore 11,000 ha of mangroves, 3,000 ha of swamp forests, and to strengthen natural regeneration of 9,000 ha of seagrass and 134 km of coral reefs. The project builds on the successful outcome of the “Manglar Vivo” Project that aimed at reducing the vulnerability to coastal flooding through ecosystem-based adaptation in the southern part of the island.

For those countries that do not include concrete blue carbon actions directly in their actions or targets in their NDCs, their experience with NbS and the extent of their territory that has wetlands provides an excellent entry point to explore and adopt climate solutions anchored in the blue economy and blue carbon specifically.

Although there are positive stories to tell in this region, further opportunities exist to recognize the value of those ecosystems and scale up action and funding to protect coastal and marine habitats. Countries should continue to integrate and deepen blue economy, NbS, and blue carbon in their NDCs and strengthen their enabling environments to support the successful implementation of these actions. Recognising the contribution of a blue economy to both the mitigation and adaptation goals in NDCs not only helps attract more climate finance, but it also supports increasing ambition to achieve climate change goals.

## 4. Additional resources

To support further learning and knowledge gathering surrounding blue economy, blue carbon, and NbS in relation to climate action, Table 5 provides a list of resources that can provide further insights and information to readers based on their needs.

**Table 5: Blue economy, blue carbon, and NbS resources**

Theme	Type	Title	Publisher
Blue economy, blue carbon and bluecarbon ecosystems	Report	<a href="#"><u>Options for strengthening action on the ocean and coasts under the UNFCCC</u></a>	IUCN
	Report	<a href="#"><u>The Blue Carbon Handbook. Blue carbon as a nature-based solution for climate action and sustainable development</u></a>	High Level Panel for Sustainable Ocean Economy
	Guidelines	<a href="#"><u>Blue Carbon and Nationally Determined Contributions: Guidelines on Enhanced Action</u></a>	The Blue Carbon Initiative
	Guide	<a href="#"><u>Blue Carbon in Marine Protected Areas: Guide to Understanding and Increasing Protection of Blue Carbon</u></a>	National Oceanic and Atmospheric Administration
	Guide	<a href="#"><u>Action brief: An ocean of opportunities: how the blue economy can transform sustainable development in small island developing states</u></a>	UNDP
	Dataset	<a href="#"><u>Global extent of mangroves for select years from 1996 to 2020.</u></a>	Global Mangrove Watch
	Dataset	<a href="#"><u>Data Platform for the Small Island Developing States</u></a>	UNDP
	Briefing	<a href="#"><u>Carbon stocks and sequestration in terrestrial and marine ecosystems: a lever for nature restoration?</u></a>	European Environment Agency
	Data Platform	<a href="#"><u>UN Biodiversity Lab</u></a>	UN Biodiversity Lab
	Article	<a href="#"><u>Why the Market for 'Blue Carbon' Credits May Be Poised to Take Off</u></a>	Yale Environment 350
	Article	<a href="#"><u>The potential for mangrove and seagrass blue carbon in Small Island States</u></a>	Environmental Sustainability
	Policy Brief	<a href="#"><u>Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Policy Brief</u></a>	IUCN
	Datasets	<a href="#"><u>IPCC Working Group I (WGI) Interactive Atlas</u></a>	IPCC
	Report	<a href="#"><u>Blue carbon: The potential of coastal and oceanic climate action. Nature-based climate solutions in the world's oceans can play an important role in conservation and carbon abatement efforts worldwide.</u></a>	McKinsey & Company.
	Report	<a href="#"><u>"Toward A Blue Economy: A Promise for Sustainable Growth in the Caribbean; An Overview."</u></a>	The World Bank
Report	<a href="#"><u>The Blue Economy – A Caribbean development opportunity</u></a>	Caribbean Development Bank	

Theme	Type	Title	Publisher
	Study	<a href="#"><u>The potential for mangrove and seagrass blue carbon in Small Island States</u></a>	Environmental Sustainability
	Report	<a href="#"><u>The State of the World's Mangroves 2022.</u></a>	Global Mangrove Alliance
	Training	<a href="#"><u>Three trainings available: 1) Blue Planning in Practice, 2) Sustainable Blue Economy and 3) Blue Leadership</u></a>	Blue Solutions Initiative
Nature-based solutions	Report	<a href="#"><u>Nature-based Solutions in Nationally Determined Contributions: Synthesis and recommendations for enhancing climate ambition and action by 2020</u></a>	IUCN
	Report	<a href="#"><u>Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS</u></a>	IUCN
	Report	<a href="#"><u>Nature-based Solutions in Latin America and the Caribbean: Support from the Inter-American Development Bank</u></a>	IDB and WRI
	Study	<a href="#"><u>Strategies for Large Scale Coral Reef Restoration for Coastal Resilience in the Seychelles</u></a>	World Bank
	Guide	<a href="#"><u>The Blue Guide to coastal resilience: Protecting coastal communities through nature-based solutions</u></a>	USAID, Nature Conservancy
Blue carbon calculation methodologies	Tool	<a href="#"><u>VM0007 REDD+ Methodology Framework (REDD+MF), v1.6</u></a>	Verra
	Article	<a href="#"><u>Estimating Mangrove Carbon Stocks for Belize</u></a>	Global Mangrove Alliance
	Report	<a href="#"><u>British Virgin Islands Ecosystem Accounting</u></a>	Government of the Virgin Islands
	Article	<a href="#"><u>Valuing the contribution of blue carbon to small island developing states' climate change commitments and Covid-19 recovery</u></a>	Environmental Science and Policy
	Manual	<a href="#"><u>Coastal Blue Carbon: Methods for assessing carbon stocks and emissions factors in mangroves, tidal salt marshes, and seagrass meadows.</u></a>	The Blue Carbon Initiative
UNDP relevant programmes	Service offer	<a href="#"><u>UNDP'S Ocean Innovation Challenge</u></a>	UNDP
	Service offer	<a href="#"><u>UNDP's Climate Promise</u></a>	UNDP
	Service offer	<a href="#"><u>UNDP's Ocean Promise</u></a>	UNDP
NDCs and blue carbon ecosystems	Report	<a href="#"><u>Coastal and marine ecosystems as nature-based solutions in new or updated nationally determined contributions: Provisional Analysis as of June 2021</u></a>	Ocean & Climate Platform, Conservation International, IUCN, GIZ, Rare, The Nature Conservancy and WWF
	Report	<a href="#"><u>Blue Carbon - Nationally Determined Contributions Inventory. Appendix to: Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions.</u></a>	Blue Climate Solutions, The Nature Conservancy, IUCN, GRID-Arendal, Conservation International and World Wildlife Fund
	Paper	<a href="#"><u>Enhancing Nationally Determined Contributions: Opportunities for Ocean-Based Climate Action" Working Paper.</u></a>	WRI

Theme	Type	Title	Publisher
Associated sectors	Report	<b>The Outlook For Oceans, Seas And Marine Resources In Latin America And The Caribbean</b>	ECLAC
Stakeholder engagement	Key Citations	<b><u>Key Citations for Public Participation</u></b>	IAIA
Indigenous Peoples	Key Citations	<b><u>Key Citations for Indigenous People</u></b>	IAIA
Gender	Key Citations	<b><u>Key Citations for Gender and Gender Impact Assessments</u></b>	IAIA
Gender	Guidance	<b><u>Gender Analysis and NDCs: Short Guidance for Government Stakeholders</u></b>	UNDP
Youth	Guidance	<b><u>Aiming Higher: Elevating Meaningful Youth Engagement for Climate Action</u></b>	UNDP



## References

- Beck, M. W., Heck, N., Narayan, S., Menéndez, P., Reguero, B. G., Bitterwolf, S., Torres-Ortega, S., Lange, G.-M., Pfliegner, K., Pietsch McNulty, V., & Losada, I. J. (2022). **Return on investment for mangrove and reef flood protection.** *Ecosystem Services*, 56, 101440.
- Becoultet, M., Chan, J., Espinet, X., & Nguitone Dia, A. (2021). Resilient recovery: **How can Nature-Based Solutions improve transport infrastructure resilience? Lessons from Haiti.** *World Bank Blogs*.
- Bertram, C., Quaas, M., Reusch, T. B. H., Vafeidis, A. T., Wolff, C., & Rickels, W. (2021). **The blue carbon wealth of nations.** *Nature Climate Change*, 11(8), 704-709.
- Blaufelder, C., Levy, C., Mannion, P. and Pinner, D. (2021). **A Blueprint for Scaling Voluntary Carbon Markets to Meet the Climate Challenge.** McKinsey Sustainability.
- Caribbean Development Bank. (2018). **“Financing The Blue Economy – A Caribbean development opportunity”.**
- Carlson, R., Evans, L., Foo, S., Grady, B., Li J., Seeley, M., Xu Y., Asner, G. (2021). **Synergistic benefits of conserving land-sea ecosystems.** *Global Ecology and Conservation*, Volume 28.
- CEPAL. (2018). **Efectos del cambio climático en la costa de América Latina y el Caribe: evaluación de los sistemas de protección de los corales y manglares de Cuba.**
- CLME+ SAP. (2013). **The Strategic Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems.**
- Ecosystems Division, Brown, Nicole A., Gardner, Lloyd, Leotaud, Nicole, & Rothenberger, Paige. (2020). **The State of Nearshore Marine Habitats in the Wider Caribbean.**
- Ecostem Marketplace. (2021). **“Voluntary Carbon Markets Top \$1 Billion in 2021 with Newly Reported Trades”.** 10 November 2021.
- European Environment Agency. (2022). **“Carbon stocks and sequestration in terrestrial and marine ecosystems: a lever for nature restoration?”** 27 April 2022.
- Ferrario, F., Beck, M. W., Storlazzi, C. D., Micheli, F., Shepard, C. C., & Airoidi, L. (2014). **The effectiveness of coral reefs for coastal hazard risk reduction and adaptation.** *Nature Communications*, 5(1), 3794.
- Friess DA, Howard J, Huxham M, Macreadie PI, Ross F. (2022). **Capitalizing on the global financial interest in blue carbon.** *PLOS Clim* 1(8): e0000061.
- Global Mangrove Watch.** (2020).
- Inter-American Development Bank. (2014). **Climate Change and IDB: Building Resilience and Reducing Emissions. Regional Study: LAC Small Island Development States.**
- IPCC. (2019). **Annex I: Glossary** [Weyer, N.M. (ed.)]. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 677–702.
- IUCN. (2016). Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (eds.) **Nature-based Solutions to address global societal challenges.** Gland, Switzerland: IUCN. xiii + 97pp.
- Jones, N. (2021). **“Why the Market for ‘Blue Carbon’ Credits May Be Poised to Take Off”.** *Yale Environment* 360.
- Kuwae, T., Watanabe, A., Yoshihara, S., Suehiro, F., Sugimura, Y. (2022). **Implementation of blue carbon offset crediting for seagrass meadows, macroalgal beds, and macroalgae farming in Japan,** *Marine Policy*, Volume 138.
- Leal, M. and Spalding, M.D. (editors). (2022). **The State of the World’s Mangroves 2022.** Global Mangrove Alliance.
- Lecerf, M., Herr D., Thomas, T., Elverum, C., Delrieu, E. and Picourt, L. (2021). **Coastal and marine ecosystems as Nature-based Solutions in new or updated Nationally Determined Contributions,** Ocean & Climate Platform, Conservation International, IUCN, GIZ, Rare, The Nature Conservancy, Wetlands International and WWF.

- Londoño Ramirez, Ana Lucía. (2022). “In the same boat: ocean finance, inclusivity and social equity”, UNEP FI, 7 April 2022.
- Martin, A., Landis, E., Bryson, C., Lynaugh, S., Mongeau, A., and Lutz, S. (2016). Blue Carbon - Nationally Determined Contributions Inventory. Appendix to: Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Published by GRIDArendal, Norway.
- M. Tambutti and J.J. Gómez (editors). (2020). “The outlook for oceans, seas and marine resources in Latin America and the Caribbean: conservation, sustainable development and climate change mitigation”, Project Documents (LC/TS.2020/167), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).
- National Oceanic and Atmospheric Administration. (2022). “Coastal Blue Carbon”.
- National Oceanic and Atmospheric Administration. (2022). “NOAA predicts above-normal 2022 Atlantic Hurricane Season”, May 24 2022.
- OECD. (2016), The Ocean Economy in 2030. Paris: OECD Publishing.
- Oliver, E., S. Ozment, M. Silva, G. Watson, and A. Grünwaldt. (2021). *Nature-Based Solutions in Latin America and the Caribbean: Support from the Inter-American Development Bank*. Washington, DC: Inter-American Development Bank and World Resources Institute.
- Patil, P.G., Virdin, J., Diez, S.M., Roberts, J., Singh, A. (2016). *Toward A Blue Economy: A Promise for Sustainable Growth in the Caribbean; An Overview*. The World Bank, Washington D.C.
- Pendleton L, Donato DC, Murray BC, Crooks S, Jenkins WA, Sifleet S, et al. (2012) Estimating Global “Blue Carbon” Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. PLoS ONE 7(9): e43542.
- RAMSAR. (2023). Convention on Wetlands Contracting Party (**Member States**).
- Statista. (2023). Total contribution of travel and tourism to the gross domestic product in the Caribbean in 2021, by country or territory.
- The Nature Conservancy (TNC). (2021). “How Belize is Transforming the Caribbean”.
- Thomas, T., Pidgeon, E., von Unger, M., Crooks, S., Durham, C., Herr, D., Hickey, T., Martini, C., Sandoval, M., Schindler Murray, L. and Sinclair, Z. (2020). *Blue Carbon and Nationally Determined Contributions*. The Blue Carbon Initiative. International Partnership for Blue Carbon.
- UNFCCC. (2023). NDC Registry.
- United Nations. (2023). “The ocean – the world’s greatest ally against climate change”.
- UNDP. (2023a). “An Ocean of Opportunities: How the Blue Economy Can Transform Sustainable Development in Small Island Developing States”.
- UNDP. (2023b). “Sustainable Development Goals: Goal 14 Life Below Water”.
- UNEP-WCMC, Short FT (2021). Global distribution of seagrasses (version 7.1). Seventh update to the data layer used in Green and Short (2003). Cambridge (UK): UN Environment World Conservation Monitoring Centre.
- Verra. (2020). First Blue Carbon Conservation Methodology Expected to Scale Up Finance for Coastal Restoration & Conservation Activities.
- World Travel and Tourism Council. (2021). *Travel and Tourism Economic Impact 2021*.
- World Travel and Tourism Council. (2022). Travel and Tourism in the Caribbean Prospects for Growth.

## Annex I: Blue carbon stocks in mangrove forests of LAC SIDS (2020 dataset)

Name	Mangrove habitat extent (ha)	Percent of total coastline covered by mangroves	Mean mangrove above ground biomass density in 2020 (t/ha)	Mangroves found in protected areas in 2020 (ha)	Extent of protected areas (ha)	Mangrove net change from 1996 to 2020 (km <sup>2</sup> )	Total organic carbon stored in mangroves (Mt CO <sub>2</sub> e)	Extent of investible blue carbon market (ha) at \$5/ton
Antigua and Barbuda	869	17.00%	20.34	410.00	868.79	9	1.45	-
Barbados	11	0.87%	47.16	0.00	10.63	1	-	-
Bahamas	154,121	49.22%	11.91	96,881.00	154,121.15	-14,889	226.27	-
Belize	52,869	88.63%	17.95	15,868.00	52,869.44	-2,032	72.04	300 (+/- 100)
Cuba	359,694	66.35%	29.28	181,950.00	359,694.11	-29,188	613.78	10,000 (+/- 5,400)
Dominica	1	0.38%	26.6	1.00	1.43	0	-	-
Dominican Republic	19,184	22.12%	43.03	15,413.00	19,184.40	-457	30.068	200 (+/- 100)
Grenada	193	10.03%	61.28	63.00	193.00	1	0.27	0
Guyana	28,859	10.21%	130.11	14,353.00	28,859.27	-1,949	46.09	1,300 (+/- 100)
Haiti	15,401	27.93%	17.39	6,649.00	15,401.11	-1,279	26.15	1,900 (+/- 400)
Jamaica	9,945	33.94%	37.74	7,353.00	9,945.04	-606	15.32	200 (+/- 100)
Saint Kitts and Nevis	35	3.07%	13.01	19.00	34.55	1	0.03	-
Saint Lucia	162	4.27%	67.56	104.00	162.37	-1	0.27	-
Saint Vincent and the Grenadines	33	2.85%	71.76	21.00	32.52	0	0.04	-
Suriname	80,044	5.99%	80.63	56,980.00	80,043.86	4,059	102.55	2,800 (+/- 1,200)
Trinidad and Tobago	8,223	15.85%	84.12	1,977.00	8,223.15	-84	8.61	-

Source: [Global Mangrove Watch](#). (2020).



## Annex II: Status of blue carbon stocks in seagrasses in LAC SIDS (2021)

State or territory	Seagrass area (ha)
Antigua and Barbuda	24,963
Barbados	8,962
Bahamas	226,116
Belize	490,129
Cuba	1,401,505
Dominica	51,691
Dominican Republic	35,669
Grenada	1,022
Guyana	0
Haiti	74,863
Jamaica	79,169
Saint Kitts and Nevis	6,008
Saint Lucia	661
Saint Vincent and the Grenadines	0
Suriname	0
Trinidad and Tobago	0

Source: UNEP-WCMC, Short FT (2021). [Global distribution of seagrasses](#) (version 7.1).



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