UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Technical and statistical report

A deep dive into ocean-related measures in the nationally determined contributions of small island developing States

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Abbreviations

ABM	area-based management
BBNJ Agreement	Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction
CO_2	carbon dioxide
COP	Conference of the Parties
EEZ	exclusive economic zone
GDP	gross domestic product
GHG	greenhouse gas
GFS	global fuel standard
ICZMP	integrated coastal zone management plan
IMO	International Maritime Organization
MPA	marine protected area
MSP	marine spatial planning
NDCs	nationally determined contribution
ODA	official development assistance
SIDS	small island developing States
Solar PV	solar photovoltaic
UMGL	Universal Mandatory Greenhouse Gas Levy
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change

Executive summary

SIDS are disproportionately impacted by the consequences of climate change, which include sea level rise, increased frequency of extreme weather events and ocean acidification (IPCC, 2023). As countries begin preparations for the third round of nationally determined contributions (NDCs) – submitted since 2016 pursuant to obligations under the Paris Agreement – forming a complete understanding of the adverse effects of climate change on Small Island Development States (SIDS) is crucial. In fact, the ability to prevent, mitigate and manage these impacts and address the losses and damages that arise despite climate action and strategies, will play a key role in the next iteration of NDCs.

This technical note aims to provide an analysis of measures in the NDCs of SIDS which target the oceans, to gain a better understanding of the level of ambition of these countries and their strategies to sustainably develop ocean economies and conserve the ocean and marine ecosystems. Increasing knowledge of ocean measures used in the NDCs of SIDS will be fundamental as they prepare to submit their updated NDCs to the thirtieth Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) in 2025, and in the period preceding the third UN Ocean Conference scheduled for Nice, France, in June 2025. In fact, given the high dependence of SIDS on economic activities related to the ocean, integrating ocean sustainability into their climate action strategies and recognizing the critical role that healthy marine ecosystems play in their environmental and economic stability, will prove crucial for the success of the next generation of NDCs.

This note provides a detailed analysis of the most recent NDCs submitted by 39 SIDS in terms of oceans measures listed, approaches used, level of conditionality and their relationship to trade. The analysis shows that 606 measures focus on the oceans, of which 328 relate to the sustainable use of the ocean economy and 278 to ocean conservation. Out of the 39 SIDS, 36 have at least one measure related to oceans in their NDCs. It further reveals that SIDS have placed particular attention on adapting to the immediate effects of climate change and building long-term resilience through adaptive responses. In fact, adaptation measures represented 77 per cent of total ocean measures, while mitigation measures accounted for the remaining 23 per cent. The low share of mitigation measures can be explained by the fact that SIDS contribute less than 1 per cent of global greenhouse gas (GHG) combined emissions but disproportionately suffer from the damaging impacts of climate change, with some of these countries potentially becoming uninhabitable in the future(IRENA, 2024). Only 3 per cent of ocean measures (or 19 measures) were explicitly labelled by countries as advancing loss and damage measures.

A total of 123 measures – or 20 per cent of the total – were explicitly or implicitly connected to trade, revealing an untapped potential for the role that trade can play in supporting SIDS in their mitigation and adaptation efforts. This 20 per cent is divided between 16 per cent of total measures indirectly related to trade, and only 4 per cent directly related to trade.

Finally, 64 per cent of ocean measures have been identified as conditional on financial, technical or other forms of support from the international community for their implementation, highlighting the necessity of the international community to support SIDS in their climate action.

The subsectors with the highest number of measures were conservation related, specifically area-based management (ABM) (121 measures), ecosystem protection and expansion and restoration (101 measures). In contrast, marine and coastal tourism (92 measures) and marine fisheries (85 measures), key economic sectors for many SIDS, were the third and fourth most targeted subsectors.

The note concludes by presenting the following way forward:

- Particular attention should be given to the need to improve ocean measures within the NDCs of SIDS, and all oceanic and coastal countries, to increase homogeneity, measurability, actionability and enforceability.
- Trade should be further leveraged, focusing on its contribution to the ocean economy and conservation and considering how ocean measures affect trade flows.
- UNCTAD's Sustainable Ocean-based Economies Classification and ocean trade dataset can be a valuable tool for providing improved understanding of the trade value of ocean economy measures in the NDCs of SIDS, as well as all other countries.
- Finally, there is a need to scale-up financial support for SIDS to include ocean measures within their NDCs.

Chapter 1

Introduction

Since the adoption of the Paris Agreement in 2016, SIDS have been submitting their national climate action plans - also known as NDCs - to the UNFCCC, which included their GHG emissions reduction targets as well as their measures for climate change mitigation and adaptation. Due to the economic, social, environmental and cultural value of the oceans for SIDS, UNCTAD has identified the assessment of the ocean measures in the NDCs of SIDS as a priority.

SIDS are a specially recognized group of 39 States[1] located between the Caribbean, Pacific, Atlantic and Indian oceans. These States, with a combined estimated population of almost 71 million people in 2023 (UNCTADstat, 2024a), face unique social, economic and environmental vulnerabilities because of their remote geography, high vulnerability and limited local resources. SIDS heavily depend on external markets and connectivity for the supply of many goods and services. In addition, 90 per cent of SIDS are located in the tropics, making them particularly susceptible to extreme weather events such as hurricanes, droughts and flooding and the economic and social consequences that arise from them (UN-OHRLLS, 2015).

In recent years, SIDS have increasingly self-identified as "large ocean States", rather than the commonly used description of "small States", to emphasize their vast ocean territories. In fact, the average ratio of exclusive economic zone (EEZ) to land area of SIDS[2] is 28:1, with countries like Tuvalu owning an EEZ more than 25,000 times the size of its land mass (UN-OHRLLS, 2020). Because of their ocean extension, SIDS account for 30 per cent of the global tuna catch and are home to more than 20 per cent of global biodiversity and 40 per cent of the world's coral reefs, which contribute to the fishing and tourism industries, provide coastal protection, prevent natural disasters and mitigate damage from unstable weather (UN-OHRLLS, 2017). Regrettably, both the migratory and reproductive patterns of fish stocks and the health of coral reefs are threatened by unsustainable fishing practices, climate change and consequent ocean warming, acidification and deoxygenation (Cambridge University Press, 2023).

Trade in ocean-based goods and services represents a significant component of SIDS' economies. In 2022, SIDS saw exports of ocean-based goods reach $20 billion, representing about 2 per cent of their total gross domestic product (GDP) and 2.4 per cent of the world's exports in such goods. Exports of ocean-based services from these nations amounted to roughly $140 billion, making up 12 per cent of their world's exports in this category and approximately 14 per cent of SIDS' overall GDP (UNCTADstat, 2024b).[3]

For decades, SIDS and the oceans surrounding them have been part of the

SIDS highlight their identity as 'large ocean States' with widespread ocean conservation and sustainable use measures in their NDCs

[1] United Nations Office of the High Representative for the Least Developed countries, Landlocked Developing Countries and Small Island Developing States' list of SIDS: Antigua and Barbuda, Bahamas, Barbados, Belize, Cabo Verde, Comoros, Cook Islands, Cuba, Dominica, Dominican Republic, Fiji, Grenada, Guinea-Bissau, Guyana, Haiti, Jamaica, Kiribati, Maldives, Marshall Islands, Federated States of Micronesia, Mauritius, Nauru, Niue, Palau, Papua New Guinea, Samoa, São Tomé and Príncipe, Singapore, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Solomon Islands, Suriname, Timor-Leste, Tonga, Trinidad and Tobago, Tuvalu and Vanuatu. See www.un.org/ohrlls/content/list-sids.

[2] An EEZ is defined as "an area of the ocean, generally extending 200 nautical miles (230 miles) beyond a nation's territorial sea, within which a coastal nation has jurisdiction over both living and nonliving resources." See https://oceanexplorer.noaa.gov/facts/useez.html#:~:text=An%20%E2%80%9Cexclusive%20economic%20zone%2C%E2%80%9D,both%20living%20and%20nonliving%20resources.

[3] For more information, see https://unctadstat.unctad.org/datacentre.

international development agenda. In fact, they both appeared on Agenda 21 of the United Nations Conference on Environment and Development in 1992. In that document, SIDS were recognized as a special case for the environment and development because of their ecological vulnerability and isolation from markets. At the same time, the marine environment – including the oceans and all seas and adjacent coastal areas – has been identified as "an essential component of the global life-support system and a positive asset that presents opportunities for sustainable development" (United Nations, 1992).

Against this background, SIDS, together with other States, have shown their commitment to climate action by adopting the Paris Agreement,[4] a legally binding international treaty on climate change under the UNFCCC. In terms of the Paris Agreement, since 2016, countries have been submitting their national climate action plans, also known as NDCs, to the UNFCCC. In these documents, each Party sets GHG emissions reduction targets and communicates its strategy for climate change adaptation, reflecting its highest possible ambition to tackle climate change, while considering its common but differentiated responsibilities, respective capabilities and national circumstances. NDCs are periodically updated and resubmitted every five years.[5]

While the content of NDCs is not legally enforceable, they are subject to mandatory submission and transparency requirements and to multilateral monitoring under the UNFCCC stocktake exercise process, during which they are collectively assessed. At the twenty-eighth COP of the UNFCCC, held in 2023 in Dubai, United Arab Emirates, the first-ever global stocktake exercise took place. This exercise allowed countries and stakeholders to identify the areas in which they are collectively making progress towards meeting the goals of the Paris Agreement — and the areas in which they are not. One of the main outcomes of the global stocktake exercise was Parties' acknowledgment that ecosystem-based approaches, including ocean-based adaptation and resilience measures, can reduce a range of climate change risks and provide multiple economic, environmental, social and cultural benefits (UNFCCC, 2023a). The global stocktake also re-emphasized the imperative of immediate action and made clear that countries were not on track to meet the Paris Agreement's ambitious targets.

As one of the first United Nations entities to recognize the challenges facing SIDS and support "urgent and concrete action to address the vulnerability of SIDS" (United Nations General Assembly, 2014), and following a mapping exercise of trade-related measures in NDCs,[6] UNCTAD identified an assessment of the ocean measures in the NDCs of SIDS as a priority. This technical note provides an analysis of the ocean measures included in SIDS' NDCs, with a view to offering clearer insight into the ambitions of these countries and their strategies in the areas of sustainable ocean economy and ocean conservation.

For this analysis, the measures are categorized according to different characteristics. First, they are categorized according to horizontal characteristics, including their climate approach (mitigation, adaption and loss and damage), conditionality and trade-relatedness. Second, the measures are categorized according to their vertical economic dimension. They are grouped into either ocean economy measures, which are measures that aim at sustainable use of ocean resources for economic profit, or ocean conservation measures,

[4] For more information, see https://unfccc.int/process-and-meetings/the-paris-agreement.

[5] For more information see www.un.org/en/climatechange/all-about-ndcs#:~:text=Simply%20put%2C%20an%20NDC%2C%20or,update%20it%20every%20five%20years.

[6] For more information, see https://unctad.org/publication/mapping-trade-related-measures-nationally-determined-contributions.

which focus on protecting and restoring marine and coastal ecosystems and biodiversity. Each of these two categories has multiple subcategories based on the economic sectors they cover. By analysing ocean measures in the NDCs of SIDS, UNCTAD aims to define a baseline for the preparation and improvement of the next iteration of NDCs, set to take place after 2025 (so called NDC 3.0).

This effort is fully aligned with the mandates provided under the "Antigua and Barbuda Agenda for SIDS: A Renewed Declaration for Resilient Prosperity" put forward at the fourth International Conference on SIDS, 27–30 May 2024 (United Nations General Assembly, 2024a) and now draft UNGA A/78/L.80 resolution (United Nations General Assembly, 2024b) for adoption in late 2024 to "promote sustainable ocean-based economies by assisting in the pursuit of opportunities in sustainable fisheries, aquaculture, mariculture, marine and coastal tourism, ocean-based renewable energy, and mineral and other related resources, sustainable shipping and maritime transport and ports", in "accelerating and substantially reducing non-carbon dioxide emissions globally" and providing "timely support for action on adaptation" (United Nations General Assembly, 2024b). It is also part of the implementation efforts of the UNCTAD Strategy to support Small Island Developing States (UNCTAD, 2024c).

The technical note is organized as follows: Chapter 1 introduces SIDS particularities and a rationale for the analysis. Chapter 2 presents the methodology used to undertake the analysis. Chapter 3 provides a quantitative overview of the ocean measures included in the SIDS' NDCs from a horizontal angle, looking at objectives, patterns and trends. Chapter 4 continues with the analysis of sectoral ocean economy measures. Chapter 5 provides an in-depth analysis of conservation measures. Finally, Chapter 6 presents the main findings and a way forward, based on the analysis of the previous chapters.

Chapter 2

Methodology

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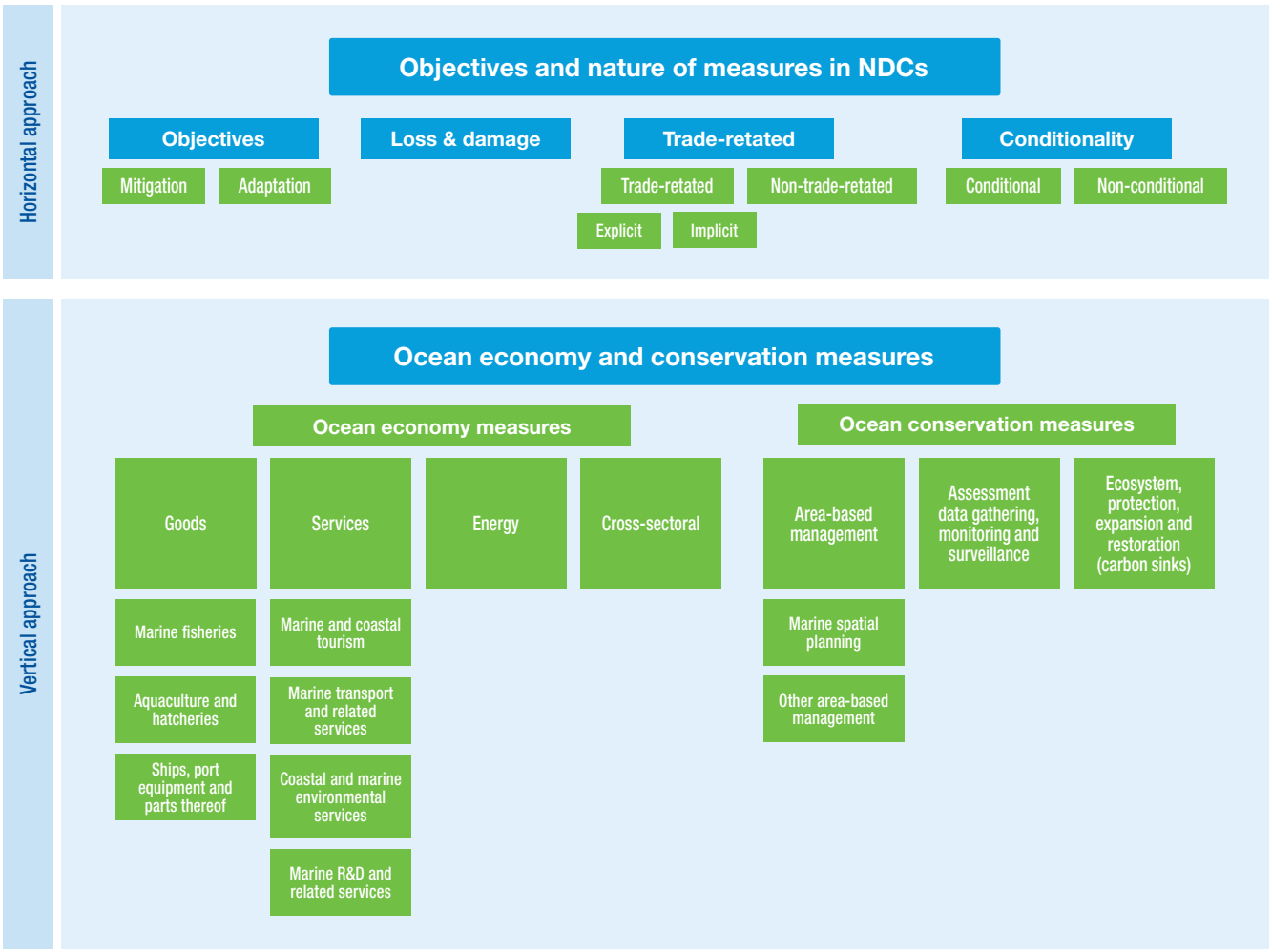
The analysis focused on the latest versions of the NDCs submitted by the 39 SIDS as of the end of September 2024, which have been reviewed using both a horizontal and a vertical approach. These approaches focused on identifying objectives and nature of the measures in NDCs, as well as the economic and conservation subsectors.

This technical note undertakes a detailed review and mapping of the ocean measures – specifically, ocean economy and ocean conservation measures – contained within the NDCs of SIDS. Ocean economy measures aim at using marine and coastal resources in a sustainable manner, while ocean conservation measures aim at protecting, preserving, managing and restoring marine and coastal ecosystems and biodiversity.

For the purposes of this analysis, the latest versions of the NDCs submitted by the 39 SIDS as of the end of September 2024 have been reviewed. The full list of the NDCs reviewed, including the version and year of submission is available in Annex I in a clickable format (with hyperlinks to each country's NDC).

The methodology developed by this technical note employed both horizontal and vertical approaches. First, all the 39

Table 1.
The methodology developed to review the ocean economy and ocean conservation measures included in the nationally determined contributions of small island developing States



Source: UNCTAD's analysis (2024).

NDCs were reviewed by utilizing general horizontal variables reflecting the unique objectives, patterns and trends that emerged from the SIDS's NDCs. Second, a vertical approach was used to conduct an additional review that considered the economic and conservation subsectors. Table 1 presents a diagram of the methodology applied in this technical note.

In order to facilitate an understanding of the analysis and because of the great diversity of NDCs, Annex II includes the detailed methodology with specific definitions of the terms used as they relate to ocean economy, and including trade aspects and ocean conservation measures.

Chapter 3

Overview of ocean economy and conservation measures in the nationally determined contributions of small island developing States

A total of 606 measures targeting the oceans have been included by SIDS in their NDCs, with 54 per cent of them classified as ocean economy measures and 46 per cent as conservation measures. Adaptation measures accounted for 77 per cent of the total, while mitigation measures accounted for the remainder. 64 per cent of the total measures identified are conditional on international financial support, technology transfer or technical assistance for their implementation. Only 3 per cent of the measures identified were explicitly labeled as loss and damage, probably due to the relative novelty of the concept for the purposes of NDCs and a lack of guidance on the concept of loss and damage.

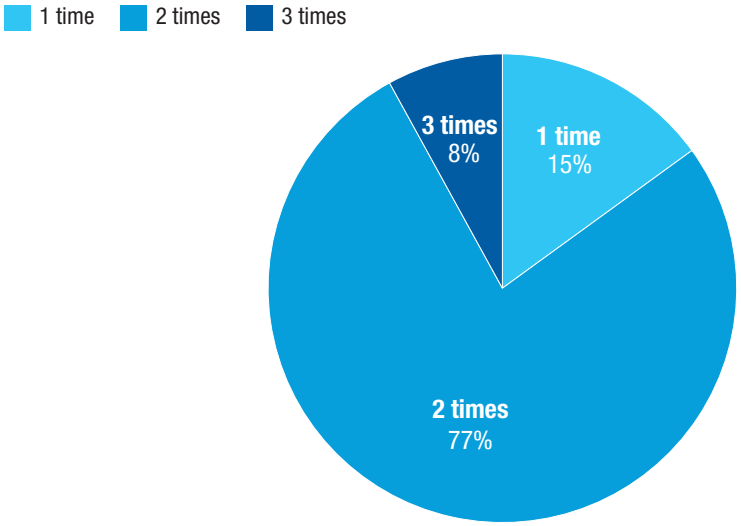
All 39 states identified as SIDS have submitted NDCs, signalling their commitment to mitigating and adapting to the impacts of climate change. However, the number of times SIDS have submitted NDCs varies, as presented in Figure 1. About 15 per cent of SIDS – a total of six States – submitted their NDCs on only one occasion. This could reflect various factors, including resource constraints or strategic decisions to invest in a single, comprehensive submission rather than periodic updates.

The majority, 77 per cent (30 SIDS in total) submitted their NDCs twice. Finally, 8 per cent (three SIDS) submitted their NDCs three times, which may suggest evolving circumstances or a continuous improvement in their commitments.

Updated NDCs tend to include more ocean-related measures, reflecting an increased recognition of the ocean's role in strengthening climate action (UNFCCC, 2023b).

SIDS' NDCs include a remarkable 606 ocean measures, with 54% for the ocean economy and 46% for conservation purposes

Figure 1.
The majority of small island developing States submitted nationally determined contributions twice since 2016



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

Overall, 54 per cent of SIDS received external assistance in drafting their latest NDCs. Among those, 43 per cent specified that they received monetary support for drafting their NDCs. Support came from a wide range of actors, such as United Nations

agencies, other international organizations, non-governmental organizations, research centres, as well as governments and non-governmental organizations.

A total of 606 measures targeting ocean economy and conservation have been included by SIDS in their NDCs. Measures targeting the oceans were identified in all SIDS' NDCs, except for Granada, Niue and Trinidad and Tobago. SIDS' NDCs included 328 ocean economy measures and 278 ocean conservation measures, divided into different subsectors, as illustrated in Figure 2. These two main sectors represented 54 and 46 per cent of the total of ocean measures, respectively.

SIDS prioritize adaptation with 77% of all Ocean Measures in NDCs seeking to address climate change Impacts

Adaptation measures represented most measures identified in the NDCs of SIDS overall, accounting for 77 per cent of total measures; mitigation measures accounted for the remainder (Figure 3). However, while only 12 per cent of conservation measures focused on mitigation, 33 per cent of ocean economy measures were aimed at mitigation. This share also varied greatly among SIDS. For instance, in most of the SIDS adaptation measures outnumbered mitigation measures, but States like the Marshall Islands and Tuvalu only included mitigation measures. These measures were also in the majority in the case of Jamaica, Kiribati and Samoa.

Support from the international community is enshrined in several articles of the Paris Agreement. For instance, Article 4 states: "support shall be provided to developing country Parties for the implementation of this Article, in accordance with Articles 9, 10 and 11, recognizing that enhanced support for developing country Parties will allow for higher ambition in their actions". Article 7 provides: "Parties recognize the importance of support for and international cooperation on adaptation efforts and the importance of taking into account the needs of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change." Article 9 also specifies the role to be played by developed countries, stating: "developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention", while "other Parties are encouraged to provide or continue to provide such support voluntarily" (United Nations, 2015).

Ocean measures which are conditional on international financial support, technology transfer or technical assistance for their implementation amount to 64 per cent of the total measures (Figure 4). Ocean economy and ocean conservation measures have similar shares, with conditional measures accounting for 63 per cent and 64 per cent respectively.

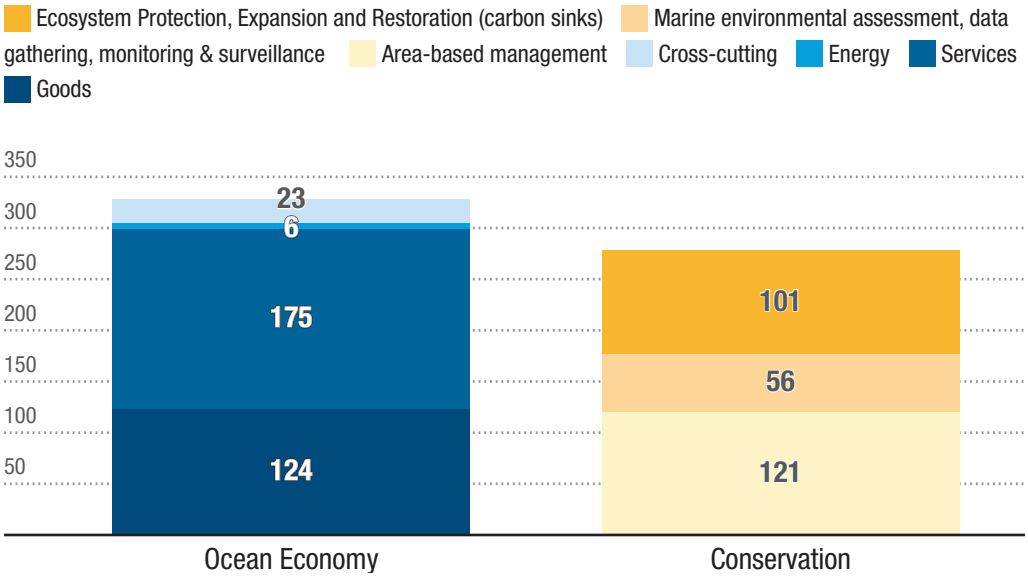
The conditionality of almost two thirds of the measures identified reflects the fact that for SIDS to achieve their ocean economy and conservation goals, regulatory, infrastructure, financial and human resources capacity gaps will have to be filled (UNCTAD, 2022). The number and content of conditional measures provide an important indication of the support needed by SIDS from the international community to speed up the implementation of their NDCs. Discussions on this topic were central to the fourth International Conference on Small Island Developing States, held in Antigua and Barbuda in May 2024,[7] and are expected to continue at the fifth UNCTAD Oceans Forum in March 2025 and the third UN Ocean Conference in June 2025.[8]

The principle of loss and damage has been included in Article 8 of the Paris Agreement, through which Parties recognize: "the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and

[7] For more information, see https://sdgs.un.org/conferences/sids2024.

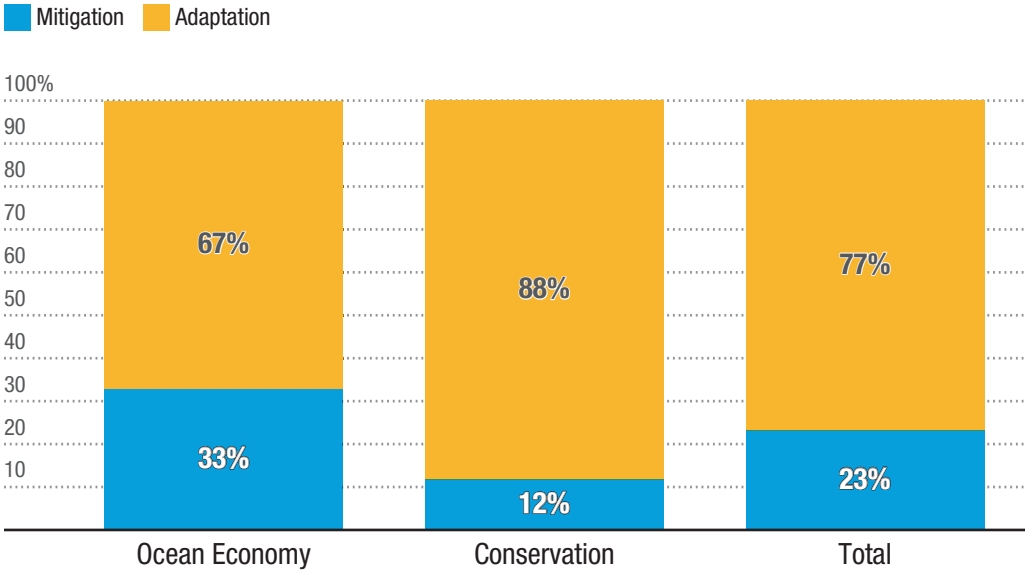
[8] For more information, see https://sdgs.un.org/conferences/ocean2025.

Figure 2.
Ocean economy and ocean conservation measures are almost equal in number in the nationally determined contributions of small island developing States



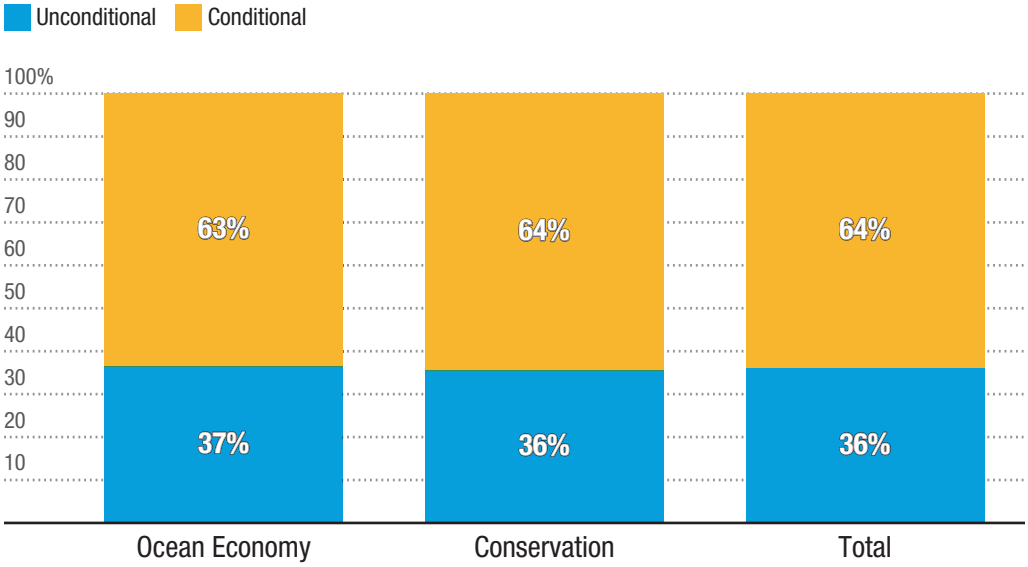
Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

Figure 3.
Adaptation measures represent the majority among ocean economy and ocean conservation measures



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

Figure 4.
Most of the ocean measures in the nationally determined contributions of small island developing States are conditional on external support



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

damage" (United Nations, 2015). SIDS are particularly exposed to loss and damage resulting from storm surges, saltwater intrusion into freshwater supplies and permanent loss of territory due to sea level rise (Government of Saint Lucia, 2021). Such phenomena will result in economic and non-economic losses, including the demise of culturally and spiritually significant landscapes and ultimately migration and displacement of coastal communities (Government of Saint Lucia, 2021). The compounding effects of climate change may also lead to rising costs for SIDS to address loss and damage and the support of the international community will be crucial.

Only 3 per cent of total ocean measures identified were explicitly labeled as loss and damage, with minimal differences between ocean economy measures (3 per cent) and ocean conservation measures (4 per cent). The low share might be due to the relative novelty of the concept for the purposes of NDCs and a lack of guidance on the concept of loss and damage and related measures, as highlighted by Saint Kitts and Nevis in its NDC (see Saint Kitts and Nevis [2021] in Annex I).

The relationship between ocean measures and trade will only be analysed for ocean economy measures because none of the ocean conservation measures have been classified as trade related.

Chapter 4

Deep dive into ocean economy measures

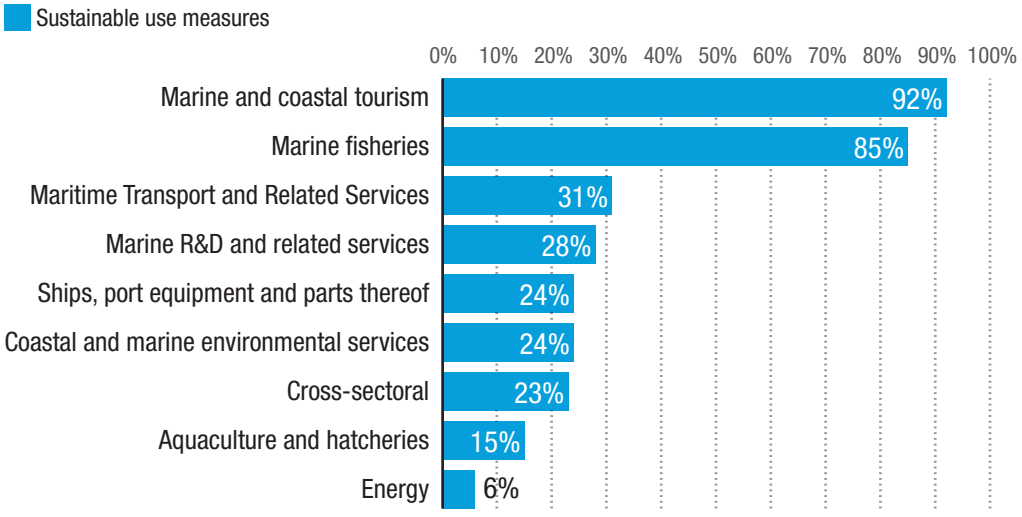
Most ocean economy measures identified focused on ocean-based services – in particular marine and coastal tourism – and ocean-based goods, in particular marine fisheries. Overall, 37 per cent of ocean economy measures have been identified as trade-related. Increasing consideration of the relationship between trade and climate policy could support the achievement of mitigation and adaptation objectives while limiting negative spillovers.

This section looks more closely at the nature and scope of the 328 ocean economy measures included in SIDS' NDCs (Figure 5). Within ocean economy subsectors, 124 measures addressed ocean-based goods, 175 targeted ocean-based services, 6 focused on energy, and 23 were cross-sectoral. By integrating sustainable ocean economy measures across sectors, SIDS are leveraging their significant ocean resources to foster economic growth while ensuring the long-term health and productivity of their marine and coastal environments.

Within the ocean-based goods and services subsectors, the largest number of ocean economy measures identified were related to marine and coastal tourism (92) and marine fisheries (85), followed by marine transport and related services (31) and marine research and development (R&D) and related services (28). This clearly reflects the relevance of these economic measures to SIDS's GDP and export structure.

SIDS NDCs underline the role of ocean services with 175 measures seeking to boost infrastructure resilience and connectivity

Figure 5.
Marine and coastal tourism and marine fisheries are the most addressed ocean economy subsectors in the nationally determined contributions of small island developing States



Notes: For the definition of each subsector see Annex II.

Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

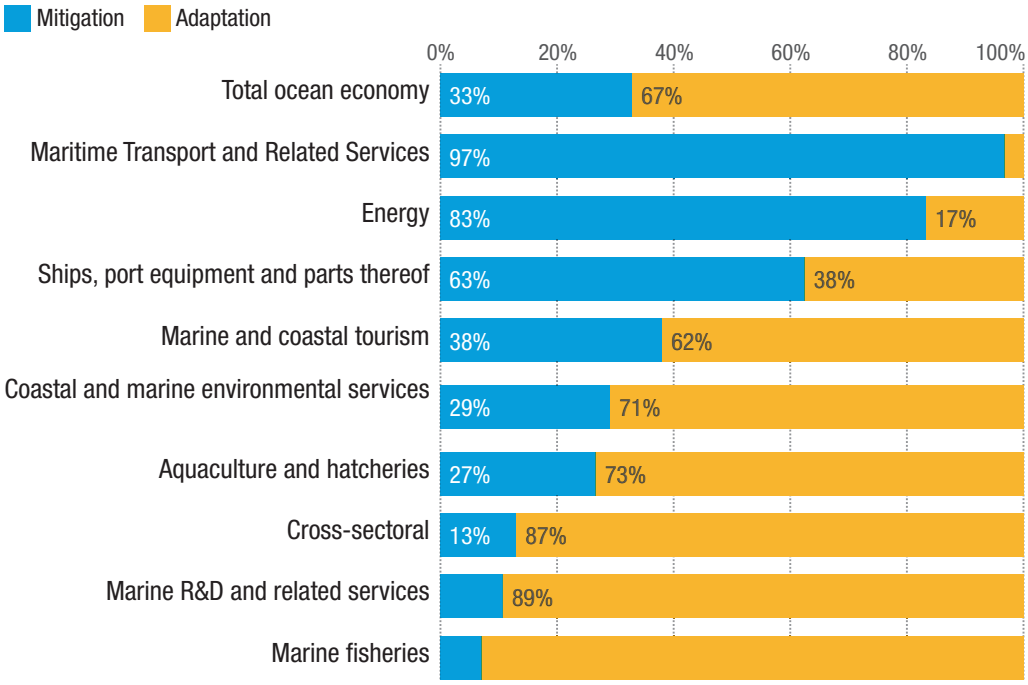
On average, mitigation measures still represent the minority (33 per cent) of all ocean economy measures (as shown in Figure 6), but their share is higher than for the total of ocean measures (23 per cent).

Breaking down the different subsectors, the share of mitigation versus adaptation measures is highly diverse. For instance, measures are strongly focused on mitigation in these sectors: marine transport and

related services, energy and ships, port equipment and parts thereof. This can be explained by the role that these sectors play in using fossil fuels and energy and the consequential carbon dioxide (CO_2) emissions in SIDS. Indeed, electricity generation direct use of energy for transportation purposes (which includes sea, land and air transport) account for most emissions in many SIDS, and more than 80 per cent of total emissions in States such as Antigua and Barbuda, Barbados, Grenada and Marshall Islands (Attard et al., 2021).

On the other hand, less than 20 per cent of measures classified as cross-sectoral, marine R&D and related services and marine fisheries, targeted mitigation objectives. The nature of these activities provides an explanation: the sectors are most likely to be affected by climate change and therefore need adaptation measures, while their potential for mitigation is low, based on the limited emissions they produce. Finally, marine and coastal tourism, coastal and marine environmental services, and aquaculture and hatcheries float between these two main trends, with mitigation measures accounting for 20 per cent to around 40 per cent of total measures identified.

Figure 6.
Overall, mitigation measures account for one third of ocean economy measures, but shares among subsectors are highly diverse



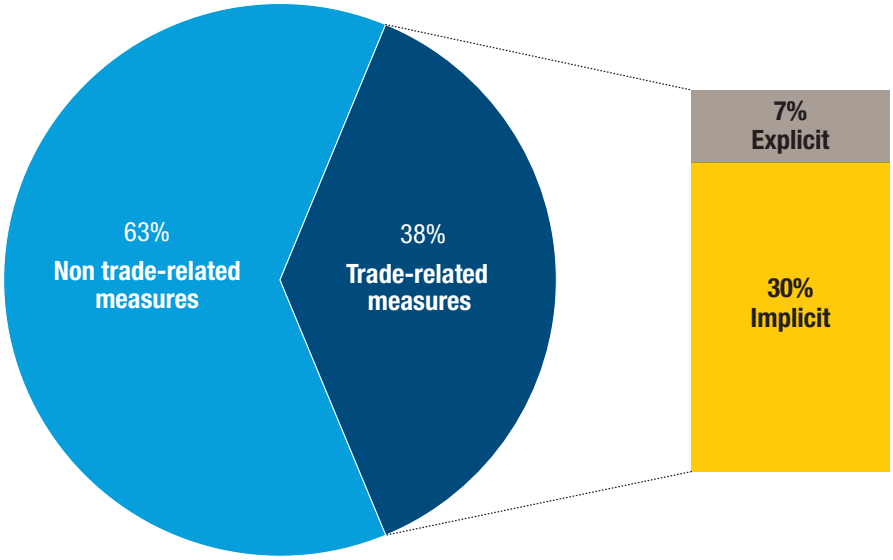
Notes: For a definition of each subsector see Annex II.

Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

Most of the ocean economy measures are conditional (63 per cent), in line with the average of total ocean measures (64 per cent) (see Figure 4 in Chapter 3).

When looking at the relationship between ocean economy measures and trade, 63 per cent of ocean economy measures were not trade-related, with the remaining 37 per cent being trade-related (Figure 7). In addition, out of the 37 per cent of trade-related measures, 30 per cent were implicitly trade-related and only 7 per cent were explicitly trade-related. This demonstrates that there is significant opportunity to provide guidance and enhance the use and incorporation of trade-related measures in SIDS's NDCs.

Figure 7.
Most ocean economy measures in the nationally determined contributions of small island developing States are not trade-related



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

In 2022, the export value of ocean goods in SIDS reached $20 billion (3.2 per cent of total goods exports), while the export of ocean services totalled $140 billion (35 per cent of total services exports) (UNCTADstat, 2024b). Exports of goods mainly reflect fisheries and ship and port equipment, while services represent a larger share of total exports because of tourism.

On one hand, trade policy has the potential to positively affect climate action for the oceans by, for example, limiting illegal fishing through improved traceability or by reducing or phasing out harmful fisheries subsidies. On the other hand, trade itself can be affected by climate policy, as in the case of investment to support local value addition in fisheries and aquaculture, or the promotion of ecotourism options. Considering this two-way relationship between trade and climate policy in the next iteration of NDCs – that is, considering how trade policy can support climate action and, in turn, how climate policy can affect trade flows – could improve the achievement of mitigation and adaptation objectives and limit negative spillovers.

4.1. Trade in goods

4.1.1. Marine fisheries

The marine fisheries sector holds significant value for SIDS, serving as a crucial source of food security, job creation and trade revenues. In 2021, "sustainable fisheries"[9] represented 0.5 per cent of SIDS' collective GDP,[10] more than five times the world average of 0.09 per cent. Fisheries, agriculture and tourism are among the export sectors of developing countries, and particularly of SIDS, that will be most negatively affected by climate change in terms of output and productivity (UNCTAD, 2021a). An analysis of different sectors shows that in 2022, exports from the primary marine fisheries and aquaculture industries of SIDS made up 0.7 per cent

[9] Fisheries harvested at biologically sustainable levels.

[10] For more information, see Food and Agriculture Organization of the United Nations' SDG Indicators Data Portal. Available at www.fao.org/sustainable-development-goals-data-portal/data/indicators/1471-value-added-of-sustainable-fisheries/en#:~:text=Indicator per cent2014.7.,Gross per cent20domestic per cent20product per cent20(GDP.

of the global export market, with the total export value from SIDS in these sectors amounting to $704 million.[11] CO_2 emissions generated by global fishing fleets powered mainly by fossil fuels such as marine diesel, are estimated to be between 0.1 to 0.5 per cent of global CO_2 emissions and 4 per cent of CO_2 emissions generated by global food production, according to the latest available data (UNCTAD, 2024a).

A total of 85 measures targeting marine fisheries were identified in SIDS' NDCs. Around 93 per cent of these measures focused on adaptation, with the remaining 7 per cent targeting mitigation. A total of 9 measures were identified as loss and damage responses. Overall, 67 per cent were conditional on external support. An explicit trade relationship was identified in 9 per cent of the total of marine fisheries measures, while 33 per cent of them only had an implicit link with trade.

Overall, 21 countries recognized the importance of this sector in their NDCs by incorporating relevant measures, the highest for any ocean economy subsector.

Among the countries analysed, Antigua and Barbuda and São Tomé and Príncipe had the largest share of marine fisheries measures of the total measures identified in their NDCs, while the NDC of Dominica included the highest overall number of marine fisheries measures. All the measures targeting marine fisheries that Antigua and Barbuda included in its NDC focused on adaptation and loss and damage. In fact, these measures aimed to support fisherfolk to manage risks resulting from increasing climate variability, provide resilience insurance and livelihood protection schemes, and strengthen the physical resilience of the fisheries sector. Similarly, São Tomé and Príncipe's marine fisheries measures focused on adaptation. However, in this case, measures focused on strengthening infrastructure, equipment and sustainable techniques for fisheries, such as the construction of biodegradable fish aggregating devices or the strengthening of marine security for artisanal fishers. In the case of Dominica, efforts in marine fisheries focused on the implementation of a sustainable resource management strategy, which envisaged community outreach programmes, training, skills development and the introduction of social security nets. Measures to increase the resilience of infrastructure in the fisheries sector and to improve climate risk management were also included. Marine fisheries measures listed by both Antigua and Barbuda and Dominica are conditional on external support for their implementation.

4.1.2. Aquaculture and hatcheries

Aquaculture has the potential to play a significant role in the economy of SIDS, offering employment opportunities and enhancing the livelihoods of local communities. While the production of global capture fisheries remained stable in the past decade at between 86 million tons and 96 million tons, aquaculture experienced sustained growth, surpassing the production of capture fisheries for the first time in 2022 and reaching 94 million tons against 91 million tons (FAO, 2024).

The sector has grown at a rate of 5 per cent annually over the past two decades (FAO, 2024), particularly in emerging economies and developing countries, generating income both for governments through the taxation of the activity, and individuals working within it. This not only contributes to economic stability and job creation but also supports the broader objectives of sustainable development, food security, economic diversification and poverty alleviation within island nations (FAO, 2014).

Global aquaculture activities were estimated to account for 0.49 per cent of anthropogenic GHG emissions in 2017 (MacLeod et al., 2020). GHG emissions by

[11] For more information, see https://unctadstat.unctad.org/datacentre/dataviewer/US.OceanTrade. This calculation does not include processed fish or income from fish access agreements.

this sector are usually the consequence of the production of fish feed, rearing of fish in water, energy use in processing and packing and related transport. In intense and large-scale aquaculture, other environmental and health concerns are also significant. They include land use to produce feed, biodiversity loss, water pollution, eutrophication, antibiotic abuse and microbial resistance. These concerns need to be carefully managed.

For many SIDS, aquaculture is still an incipient activity. There is a significant lack of production data in many SIDS, but it has been estimated that they produced over 71,530 tons of aquaculture output with an estimated value of approximately $202 million in 2017 (FAO, 2020). Cuba, Solomon Islands, Papua New Guinea, Singapore and Kiribati were the main aquaculture producers among SIDS in terms of quantity in 2017, while Cuba, Singapore, Mauritius, Dominican Republic and Papua New Guinea were the top producers in terms of value (FAO, 2020).

A total of 15 measures in the NDCs of SIDS targeted the aquaculture and hatcheries sector, demonstrating that pledges for mitigation and adaptation within the sector are currently limited. Among these measures, 4 targeted mitigation objectives (27 per cent), while the remaining 11 focused on adaptation (73 per cent). In addition, 73 per cent of the measures were listed as conditional, indicating a reliance on external support — whether technical, financial, or through capacity building — for their implementation. Fifty-three per cent of aquaculture and hatcheries measures had implicit trade links, while only 7 per cent of them were explicitly trade-related. In total, eight SIDS included measures related to aquaculture and hatcheries in their NDCs.

Jamaica and São Tomé and Príncipe were the countries with the highest share of measures relating to aquaculture and hatcheries in their NDCs, while the highest overall number of aquaculture and hatcheries measures was identified in the NDC of Dominica. Jamaica identified the expansion of the aquaculture sector as a path to diversification of food production, while São Tome and Príncipe explicitly targeted the development of aquaponics. Finally, Dominica focused on sustainable aquaculture development and improved management and resilience in fish farming systems. Both Dominica and Jamaica listed the aquaculture and hatcheries measures as conditional. Measures for the development (Dominica) and diversification (Jamaica) of the sector were considered to be implicitly trade-related, as it is assumed they will impact trade in such products.

4.1.3. Ships, port equipment and parts thereof

Vessels and ports represent essential vehicles and infrastructure that act as key drivers of economic growth, connectivity and development. Continuity of the maritime trade routes, maintenance of vessels and port services are of key importance to SIDS. These islands, often limited in resources and geographical space, depend heavily on their ports to facilitate the import and export of goods, resources and services (UNECA, 2014). The exports of ships, port equipment and their parts by SIDS represented 1.8 per cent of global exports in 2022, bringing the total value of SIDS exports in this sector to $5,3 billion, a 43 per cent increase compared to 2021.[12]

While SIDS tend not to be large producers of ships, ships parts and port equipment, both the export and import of these goods are important for the continuation of maritime trade routes and efficiency in cargo handling. In 2024, SIDS accounted for an astounding 28 per cent of the value of the global merchant fleet by flag of registration (UNCTADstat, 2024c). However, three SIDS stand out: Marshall Islands, Singapore and Bahamas, which represent about 90 per cent of registration by merchant ships in

[12] There could be some degree of re-exporting in this data. For more information, see https://unctadstat.unctad.org/datacentre/dataviewer/US.OceanTrade.

SIDS and therefore account for the lion's share of the open ships' registry business. The registration services often require repair and port services for registered ships, including parts and equipment.

A total of 24 measures related to the ships, port equipment and related parts sector were identified in SIDS' NDCs. Among them, 63 per cent were focused on mitigation and the remaining 27 per cent on adaptation. Three quarters of these measures were conditional on external support for their implementation. Sixty-three per cent of the measures relating to ships, port equipment and related parts were implicitly trade-related and 4 per cent were explicitly trade-related.

In total, 13 SIDS included measures related to ships, port equipment and related parts in their NDCs. Tuvalu and Palau were the States with the highest share of measures related to this subsector and Tuvalu was also the State with the highest overall number of measures in this subsector. The measure detailed by Palau focused on reducing CO_2 emissions by mandating the use of four-stroke outboard motor engines. Measures in Tuvalu's NDC focused on better facilities for expediting cargo handling, maintenance of maritime infrastructure and future harbour development.

4.2. Trade in services

4.2.1. Marine and coastal tourism

The value of global exports of coastal and marine tourism services went from a record of $673 billion in 2019 to the lowest level on record ($187 billion) in 2020 as a consequence of the COVID-19 pandemic and its related restrictions, partially rebounding to $465 billion in 2022. In the same year, the export of marine and coastal tourism services by SIDS reached more than $38 billion, which amounted to 9.5 per cent of their world exports in the sector (UNCTADstat, 2024d).

The COVID-19 pandemic caused the largest loss in global tourism revenues and economic output in SIDS in recorded history. International tourist arrivals in SIDS declined by 76 per cent in 2020 and 72 per cent in 2021 (UNCTADstat, 2024d), impacting jobs, small businesses and coastal livelihoods. SIDS were particularly affected because island tourism is more labour intensive, a key export revenue and a major part of the balance of payments. In 2023 however, SIDS received 36 million international tourists, a recovery of 91 per cent compared to 2019 (UNCTADstat, 2024d).

It is estimated that the global tourism sector is responsible for around 8 per cent of global GHG emissions (Lenzen et al., 2018). While there are no official global estimates, half of these emissions can be linked in some way to "sun, sea and sand" tourism and cruise tourism because more than half of global tourists choose these types of destinations for their holidays. For example, it is estimated that 60 per cent of all European tourists prefer to vacation along the seaside, which is high compared to the United States of America (about 43 per cent), but low compared to China (68 per cent) (CBI, 2021).

Tourism plays a crucial role in the sustainable development of SIDS. Their natural beauty, cultural heritage and unique geographical location make them attractive destinations for millions of tourists every year. Direct revenues from tourism account for between 0.7 and 15.2 per cent of GDP in SIDS, while revenues from international tourism account for about 38 per cent of export revenues, reaching up to 85 per cent in some cases (UNWTO, 2023).

As highlighted in the methodology, all measures addressing tourism in SIDS' NDCs are considered to be ocean measures because of the heavy reliance of SIDS' tourism industries on the ocean. This assumption is reasonable when one takes into account the share of ocean and coastal tourism in many countries, as shown above, and is fully aligned with the

UNCTAD methodology used to generate ocean trade statistics (UNCTAD, 2021b).

A total of 92 measures related to marine and coastal tourism were included by SIDS in their NDCs. Among these, 38 per cent focused on mitigation while the remainder focused on adaptation. Fifty-four per cent of these measures were listed as conditional on external support. Twenty-five per cent and 9 per cent of all marine and coastal tourism measures were respectively implicitly and explicitly linked to trade.

In total, 16 SIDS included in their NDCs measures targeting marine and coastal tourism. Among them, the Dominican Republic and Saint Kitts and Nevis had the highest share of measures targeting this sector, while Cabo Verde and Seychelles had the highest number of measures related to marine and coastal tourism in their NDCs. The percentage of marine and coastal tourism as a share of GDP in 2019[13] for Cabo Verde and Seychelles was 21 per cent and 37 per cent respectively, against a SIDS' average of 5 per cent. This means the two countries are among the highest in the group which possibly explains the high number of measures related to the subsector included in their NDCs.

Measures included in the NDCs demonstrated great variety, based on each State's unique conditions and objectives. For example, the Dominican Republic focused on advancing the tourism industry through the improvement of local infrastructure and limiting activities based on the capacity of the ecosystems affected, which is key to ensuring the long-term environmental sustainability of the sector. Saint Kitts and Nevis targeted beach replenishment and coastal protection to prevent beach erosion, as well as the expansion of marine and coastal ecotourism. Cabo Verde focused on "responsible tourism",[14] working in cooperation with the hospitality sector to offer low carbon tourism activities. Finally, the objective of Seychelles of "responsible tourism" included measures focused on the reduction of CO_2 emissions and pollution in the hospitality sector. All the measures presented, except those of Cabo Verde, were conditional on the support of the international community for their implementation.

4.2.2. Maritime transport and port related services

Maritime transport and port related services includes all services related to marine transportation of passengers and cargo, as well as the related services provided at ports. Eighty per cent of all international trade in goods is delivered via maritime transport. In 2018, international maritime shipping accounted for approximately 3 per cent of worldwide GHG emissions, an increase of around 9 per cent since 2012 (IMO, 2020), making the decarbonization of shipping a critical and urgent goal. It is important to note that shipping and aviation are not directly included in the Paris Agreement (UNFCCC, 2016) due to their cross-border and international nature. The difficult task of encouraging the decarbonization of these two sectors is being led by the International Maritime Organization (IMO) and UNCTAD for shipping, and the International Civil Aviation Organization in cooperation with the International Air Transport Association for air transport. However, this does not preclude Parties to the Paris Agreement from introducing measures related to the mitigation and adaptation efforts in this subsector.

At the international level, global initiatives are working to align and support worldwide efforts to decarbonize shipping, including in SIDS. For example, the IMO recently adopted the 2023 IMO Strategy on

[13] 2019 is used as reference to exclude the disruption that the COVID-19 restrictions had on global tourism.

[14] Responsible tourism is defined by UN Tourism (formerly United Nations World Tourism Organization) as "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities". See https://www.unwto.org/sustainable-development.

Reduction of GHG Emissions from Ships[15] ensuring an uptake of alternative zero and near-zero GHG fuels by 2030 and aiming to reach net-zero GHG emissions from international shipping by or around 2050. In complementarity with global frameworks, specific regulatory measures can also significantly contribute to enhancing energy efficiency within the shipping industry, serving as a crucial mechanism to propel the sector toward lower emissions (UNCTAD, 2023a). There are also discussions and proposals within the IMO to potentially introduce a Universal Mandatory Greenhouse Gas Levy (UMGL) and a Global Fuel Standard (GFS) for shipping. These are seen as potentially effective mid-term measures that could be taken by its members to speed up the implementation of the IMO emissions strategy (IMO, 2024), provided they consider the principle of common but differentiated responsibility and respective capabilities under the UNFCCC and the Paris Agreement.

A total of 31 measures targeting the sector were included in SIDS' NDCs, with the wide majority targeting the mitigation of the environmental impact of the shipping industry and the enhancement of the efficiency, connectivity and sustainability of port-related services. Almost all the measures identified focus on mitigation (97 per cent) and almost all of them are conditional on support from the international community (94 per cent). Thirty-nine per cent of these measures are trade-related – divided between implicitly (32 per cent) and explicitly trade-related (7 per cent) – pointing to a possible underestimation of the role that global trade can play in the decarbonization of the sector, especially for island nations whose economies are heavily dependent on the shipping industry for connectivity and import supply purposes and that rarely produce low-carbon technology for the sector in their territory.

Overall, only 26 per cent of SIDS have included in their NDCs measures focused on maritime transport and port related services. The Marshall Islands and Samoa are the SIDS with the highest share of maritime transport and port related services measures, while Dominica is the country with the highest number of overall measures in this subsector. Measures identified by the Marshall Islands focused on reducing GHG emissions from the domestic shipping sector, including through carbon pricing, while Samoa focused on developing shoreside electricity supply for vessels. Measures listed by Dominica included the assessment of hydrogen-based vessels, development of synthetic fuels, as well as an assessment of low-carbon shipping and workshops on the topic for different stakeholders.

The high share and number of measures listed under this subsector in the NDCs of certain SIDS reflect their significant role in the shipping registration business. As mentioned above, the Marshall Islands is a major participant in this industry and has taken an active stance on discussing and implementing IMO regulations. It proposed hybrid approaches to decarbonization (a mix of UMGL and GFS measures) for this subsector (IMO, 2024) and included many mitigation measures in its NDC.

4.2.3. Coastal and marine environmental services

Recognition of the significant contribution that ocean and coastal habitats offer to humanity is essential for the achievement of Sustainable Development Goal 14, which is to "conserve and sustainably use the oceans, seas, and marine resources for sustainable development".[16] In this context, coastal and marine environmental services include environmental services that contribute to sustainable development by alleviating the negative environmental

[15] For more information, see https://www.imo.org/en/MediaCentre/PressBriefings/pages/Revised-GHG-reduction-strategy-for-global-shipping-adopted-.aspx.

[16] For more information, see https://unstats.un.org/sdgs/indicators/Global-Indicator-Framework-after-2024-refinement-English.pdf.

impacts of economic activities (Mengo et al., 2022). These include, among others, sewage services, refuse disposal, sanitation and similar services, reduction of vehicle emissions, noise abatement services, nature and landscape protection services and other environmental services, regardless of the geographical area in which they are delivered (UNCTAD, 2021b). Because there is currently no classification specific to coastal and marine environmental services, the classifications for environmental services would apply when delivered for the coastal and marine environment (for example, beach cleaning services could be considered as remediation services).

The provision of these services can help to maintain and enhance ecosystem health and resilience, creating new job opportunities. Collaboration between government agencies and the private sector is fundamental to expand the sector, especially in SIDS, creating programmes and policies focused on the management, protection and restoration of the environment through the provision of coastal and marine environmental services. The delivery of these services can be achieved directly by public entities, but in most cases, they are delivered by private actors in the form of delegated authority, concessions, public procurement contracts and other services contracts. In most cases, private operators need a licence or authorization to operate. Public-private partnerships are also common under this subsector.

The measurement of these services and related trade flows is particularly challenging because the countries that gather statistics on these services at a highly disaggregated level are mainly members of the Organisation for Economic Co-operation and Development (OECD). This is the consequence of limited resources in developing countries and a lack of clarity in international reporting frameworks (UNCTAD, 2021c).

A total of 24 measures associated with the coastal and marine environmental services sector were identified in SIDS's NDCs.

Most of these measures are classified as adaptation measures (71 per cent) and focused on improving existing practices to better cope with the effects of climate change. Half of these measures (50 per cent) were conditional on international support for their implementation, underscoring the challenges SIDS face in terms of resource constraints. Seventeen per cent of the measures were identified as implicitly trade related.

Only 18 per cent of SIDS have included in their NDCs measures related to coastal and marine environmental services. Among them, Cabo Verde and Saint Kitts and Nevis are the States with the highest share and absolute number of measures in this subsector. In both cases, measures focused on improvements in desalinization efforts and water management and sanitation, in order to respond to sea level rise and reduce pollution in rivers and sea.

4.2.4. Marine research and development and related services

Marine research and development and related services comprise R&D in ocean economy sectors such as fisheries and aquaculture, but also activities related to bioprospecting, biotechnology, medical and pharmaceutical science.

Since 2010, global trade in marine R&D and related services doubled, growing from $2 billion to $4.1 billion in 2022 (UNCTADstat, 2024d). While developed countries still account for most exports (primarily because they are the main countries reporting data), developing countries seem to be growing at double their pace in this sector. Whereas the exports of developed countries doubled between 2010 and 2022, exports from developing countries quadrupled, pointing to opportunities for developing countries to play a more central role in the future. More accurate data and wider coverage is crucial to evaluate the potential of the sector.

A total of 28 measures on marine R&D and related services were identified in

SIDS' NDCs. Out of these, 89 per cent focused on adaptation, with the remaining measures focused on mitigation. More than half of the measures identified (54 per cent) were conditional on international support for their implementation. Twenty-nine per cent of marine R&D and related services measures were related to trade, of which 25 per cent had an implicit link and 4 per cent an explicit one.

Out of 39 SIDS, 11 included measures related to marine R&D in their NDCs. The Federated States of Micronesia had the highest share of marine R&D and related services measures while Dominica had the highest overall number of measures in this sector. The measures included in the NDC of Dominica focused on research on the blue economy, product development, diversification and technological advancement within the marine environment, while the Federated States of Micronesia focused on developing non-entangling and biodegradable fish aggregation devices to be used by all purse seine vessels operating in the country's EEZ.

4.3. Ocean renewable energy

Ocean renewable energy encompasses energy production techniques such as offshore wind energy, offshore solar energy, tidal energy, ocean thermal energy and wave energy. Among these technologies, offshore wind energy is the most established. Despite being at the early stage of expansion, offshore wind energy is already present in 20 countries, accounting for 7 per cent of wind capacity installed and 18 per cent of total wind capacity growth in 2022.[17] Offshore wind energy allows for cost reductions of power generation, benefiting from the possibility of installing bigger turbines in the absence of size restrictions. In addition, the development of floating offshore wind turbines could allow for the utilization of vast ocean areas where water depth (>50–60 m) currently prevents the installation of fixed turbines. In both cases, offshore wind is a promising option for SIDS with limited space, such as atoll nations.

Offshore wind energy is expected to grow significantly in the coming years, as the deployment of turbines at sea allows countries to take advantage of stronger winds. While offshore wind added 50.5 GW of capacity to the global energy output between 2017 and 2022, the prospects of growth for the five-year period 2023 to 2028 are more than three times higher, ranging between 154 GW and 181.8 GW of capacity growth, depending on the scenario.[18]

Similarly, offshore solar energy consists of solar photovoltaic (PV) installed on floating structures on bodies of water. Advantages of installing floating solar PVs include reduced land requirements, higher energy yields, and potential synergies with existing water infrastructure, while potential environmental impacts need to be further evaluated (Silalahi and Blakers, 2023). Due to their nature, such installations work best in seas without excessive wind speeds and wave heights. Based on recent studies, the most suitable maritime regions for offshore solar energy are equatorial areas, especially Southeast Asia – where SIDS such as Singapore, Timor Leste and Papua New Guinea are located – and equatorial Africa – where São Tomé and Príncipe is located (Silalahi and Blakers, 2023).

In some SIDS, such as Barbados, solar panels are being installed in fishing ports and on boats as a complementary source of energy to keep electronic and cooling systems functioning and to charge batteries, even as engines or general energy supply fails.[19] This type of initiative not only contributes to the decarbonization of subsectors such as fisheries, but also adds additional security for boats at sea and keeps port facilities functioning.

[17] For more information, see www.iea.org/energy-system/renewables/wind#tracking.

[18] For more information, see www.iea.org/energy-system/renewables/wind#tracking.

[19] For more information, see https://barbadosbydrone.com/drones/fisheries.

Tidal energy refers to the power produced by the natural rise and fall of tides caused by the gravitational interaction between Earth, the sun and the moon. Using specific generators, tidal energy can be converted into electricity. Such technology works best when situated in locations with a naturally large tidal range and where tidal channels and waterways become smaller and tidal currents stronger.[20] Despite its potential, the industry is currently only emergent.

Ocean thermal energy generates energy from the temperature differential between the deep cold and warmer surface waters of the ocean.[21] Due to the benefit that a high temperature differential between deep cold waters and surface waters warmer than 20 °C has on this technology, equatorial areas are best positioned for the deployment of ocean thermal energy.

Wave energy focuses on the exploitation of the energy generated by ocean waves through devices anchored to the ocean floor or placed below the surface of the ocean. There is significant untapped potential for the development of wave energy in both developed and developing countries. For example, the United States Energy Information Administration estimates that the theoretical annual energy potential of waves off the coast of the United States could be as much as 2.64 trillion kilowatt-hours, equal to about 63 per cent of the total utility-scale electricity generation of the United States in 2023.[22] However, while the potential seems to be vast, wave energy technology is still in the early developmental stages compared to other renewable energies like wind and solar, and it will require a significant effort to ensure the applicable technologies are cost-effective, durable, adaptable and able to tolerate dynamic and harsh coastal climatic conditions.

According to the International Renewable Energy Agency, offshore wind currently represents 1.9 per cent of global renewable energy capacity; only 0.1 per cent of renewable electricity originates from tidal and other marine sources.[23] However, the International Energy Agency-Ocean Energy Systems collaboration estimates that by 2050, there is potential for wave and tidal stream technologies to contribute 300 GW of renewable energy generation capacity, creating 680,000 jobs, generating $340 billion in gross value added, and preventing over 500 million tons of CO_2 emissions (Ocean Energy Systems, 2023).

For SIDS, energy security and decarbonization represent critical policy objectives. Shifting to a cleaner and more efficient energy system is essential for executing the mitigation strategy necessary to meet the carbon reduction pledges set forth in countries' NDCs (UNCTAD, 2023b). The shift toward renewable energy sources in SIDS could also significantly reduce fossil fuel imports, lowering trade balance disequilibrium.

While these renewable energy sources are capital- and technology-intensive and demand a skilled workforce, they are poised to evolve and become more cost-effective over time. Offshore wind, marine geothermal and tidal renewable energy sources also offer interesting options for SIDS in the medium and long term, particularly when other renewable energy alternatives are limited by terrestrial space constraints or a lack of freshwater.

A total of six measures in the ocean renewable energy sector were mentioned in the NDCs of SIDS, with the majority (83 per cent), focused on mitigation, reflecting efforts to reduce emissions through the adoption of ocean-based renewable energy sources. Four out of six of the measures (67 per cent) were conditional on international support for their implementation. Finally, four out of six of the measures (67 per cent) were identified

[20] For more information, see www.pnnl.gov/explainer-articles/tidal-energy#:~:text=What%20is%20tidal%20energy%3F,the%20water%20to%20move%20faster.

[21] For more information, see https://coast.noaa.gov/data/czm/media/technicalfactsheet.pdf.

[22] For more information, see www.eia.gov/energyexplained/hydropower/wave-power.php.

[23] For more information, see www.irena.org/Data.

as trade-related, pointing to potential trade opportunities in the promising but as yet untapped field of renewable marine energy sources for a just energy transition.

As technology advances and becomes more accessible, it is realistic to expect a rise in these numbers in future NDCs, as SIDS aim to transition towards sustainable, self-sufficient and secure energy systems. Singapore and Tuvalu were the SIDS with the largest share of ocean renewable energy measures. Singapore's measure focused on offshore solar energy for mitigation by fostering the "deployment of solar PV through investment in research, development, and demonstration (RD&D) to reduce cost, improve efficiency and enable innovative modes of deployment such as floating, offshore, and building-integrated PV". In contrast, Tuvalu focused on accelerating renewable energy, in particular by exploring, among others, ocean tidal energy conversion once it becomes available at a lower cost. Tuvalu will continue to accelerate renewable energy for electricity generation, which will reduce the demand for fuels to generate electricity. Besides solar PV, other options will also be explored, for example, solar PV with battery storage and wind and ocean tidal energy conversion (once this becomes available and affordable).

4.4. Cross-sectoral measures, including blue finance

Cross-sectoral measures span multiple sectors and address ocean sustainable use through comprehensive policies, regulations and initiatives that encourage cooperation and coordinated action in more than one subsector, or by creating synergies among them.

A total of 23 cross-sectoral measures were identified in the analysis, with the majority (87 per cent) focusing on adaptation. Fifty-two per cent of these measures were conditional and only 13 per cent of them were trade-related (divided into 9 per cent explicitly trade-related and 4 per cent implicitly trade-related measures).

Overall, ten SIDS have included cross-sectoral measures in their NDCs. Guinea-Bissau was the country with the highest share of cross-sectoral measures, while Cabo Verde registered the highest number of cross-sectoral measures. In the case of Guinea-Bissau, the measure focused on integrating agriculture and mangrove management, pointing to the development of mangrove swamp rice production. The measures detailed by Cabo Verde are at the nexus between fisheries and tourism and aim to facilitate the supply of local products to hotels, once the national food demand is satisfied, through the development of the logistics chain from local producers to hotels. In addition, the country planned to develop a gender analysis of people engaged in the blue economy to identify priority gender-specific actions.

While blue finance was not covered as a subsector under this report, it is considered a fundamental cross-sectoral tool to support the implementation of conditional commitments and to enable the sustainable use and conservation of oceans and seas in SIDS. Box 1 outlines the importance of blue finance in advancing SDG 14 and the implementation of NDCs by SIDS.

Box 1.
Blue finance as a lever for achieving Sustainable Development Goal 14 and the implementation of nationally determined contributions by small island developing States

To achieve SDG 14 – conserving and sustainably using the oceans, seas and marine resources for sustainable development – it has been estimated that at least $175 billion per year will be required between 2022 and 2030. Yet, between 2015 and 2019, a total of only $10 billion was invested (Conrad, 2022). In fact, of all SDGs, SDG 14 has received the least investment to date (McBain, 2023). Raising capital for climate action is particularly required by developing countries, which need to increase climate investments from their current level of 2.1 per cent of GDP to 6.9 per cent by 2030 to meet the targets of the Paris Agreement (Songwe et al., 2022). However, emerging and developing countries are currently spending more on interest payments than on the basic needs of their populations, such as health and education, even before climate investments (UNCTAD, 2024b). The support provided through official development assistance (ODA) currently directed to ocean activities is still extremely low at only $3.5 billion in 2022, or 1 per cent of total ODA (OECD, 2024). Of that sum, around 70 per cent is described as used for "sustainable" activities.

The urgency of scaling up financial resources for climate change and in particular for ocean-related sustainable activities has resulted in the emergence in the past decade of "blue finance": financial instruments dedicated specifically to ocean-friendly and water resources projects. Blue finance can include blue bonds, blue loans and other water-focused investments, in addition to the finances already included in the broad grouping of climate and development finance.

These new sources of finance are especially important for SIDS because the expansive oceans that surround them hold vast and yet-to-be-realized possibilities, some of which may be sustainable and beneficial and some of which may not. These States currently have an opportunity to attempt to generate and attract funding to protect and foster their ocean-based economy through the exploration of blue financial instruments, as well as to use more traditional public and development bank finance (Vivas, Barrowclough & Contreras, 2021). Against this background, innovative financial approaches, in addition to the significant expansion of traditional or existing ones, may play an important role in advancing the protection of marine and coastal ecosystems, offering support to address the challenges faced by SIDS while considering the debt burden these States already shoulder.

In their NDCs, SIDS are clear about the need for financial support to implement the measures they detail in the documents. For example, in its NDC Belize points to the need to explore "new financing options to support mangrove protection and restoration, including multilateral and bilateral funds, insurance products, debt-for-nature swaps, private investment, blue carbon credits and bonds, and other innovative conservation financing mechanisms." Similarly, the Dominican Republic mentions as a priority the management of a fund for the recovery of mangroves, estuaries and coral reefs and other coastal and marine ecosystems and species, which could help to increase resilience to the effects of climate change. Cabo Verde shares a similar strategy, aiming to create a blue fund for domestic and international financing of the blue economy and exploiting payments for environmental services to support the blue economy. Acknowledging these needs and country ambitions, UNCTAD has in recent years called for a "blue new deal" approach to finance to complement the "green" one.

Source: UNCTAD's analysis (2024).

Chapter 5

Deep dive into ocean conservation measures

Out of 278 conservation measures identified, 121 measures are related to area-based management, 101 to ecosystem protection, expansion and restoration (including carbon sinks) and 45 to marine environmental assessment, data gathering, monitoring and surveillance. The high number of conservation-related measures represent a testimony of the commitment of SIDS to enhance efforts to establish effective conservation systems and expand marine protected areas (MPAs) for both ocean conservation and carbon absorption purposes.

The long-term health of the ocean is integral to sustaining the economic activities that depend on it, as well as the traditional ways of life and knowledge of many SIDS communities. The value of marine ecosystems is multifaceted and crucial for both human well-being and the environment. While natural marine assets could be valued as highly as $24 trillion in monetary terms,[24] they also have considerable social, environmental and cultural value for many communities. Coastal and marine ecosystems provide ecosystem services that are essential for all life on earth, including the generation of oxygen, water filtration, the continuation of the nutritional cycle, maintenance of marine and coastal biodiversity, as well as heat absorption and climate regulation. Coastal ecosystems are also powerful carbon sinks. In fact, seagrass is able to remove carbon from the atmosphere and store it in the soil at three times the rate of tropical rainforests, seven times the rate of temperate forests and more than ten times that of grasslands (Scott and Lindsey, 2022).

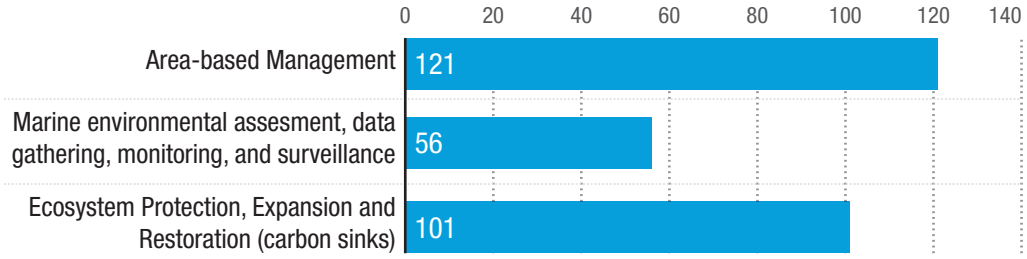
At the same time, marine ecosystems are showing a steady decline in health and productivity, particularly of species. Since 1970, marine fish populations have declined by 50 per cent, mostly due to unsustainable exploitation, followed by habitat degradation and climate change (WWF, 2015). This share increases to 71 per cent for oceanic sharks and rays, with 77 per cent of these animals currently exposed to a high risk of extinction (WWF, 2022). Yet these numbers might severely underestimate the extent of the decline due to a phenomenon called "shifting baseline syndrome", which is defined as the tendency by fishers and marine scientists to consider as a baseline the stock size and species composition of fisheries at the beginning of their careers (e.g., the 1970s) (Pauly, 1995). As a consequence, studies going back further in time, show that fish populations in specific areas (e.g., in the United Kingdom of Great Britain and Northern Ireland, for which data is available) declined by 94 per cent between 1889 and 2007, with species like halibut and haddock declining respectively by 99.1 and 99.8 per cent (Thurstan et al., 2010). This type of impact demonstrates the urgent need to preserve the overall value and functions of marine ecosystems in a fully integrated manner in NDCs, beyond simple carbon absorption objectives.

This chapter examines the nature and scope of listed conservation measures and how they are articulated within the NDCs of SIDS. Conservation of marine and coastal ecosystems, including all forms marine life, has emerged as an increasingly important feature of SIDS's NDCs. In fact, out of a total of 606 ocean measures included by SIDS in NDCs, 278 are related to conservation. Of these, 121 conservation measures are related to ABM, 101 to ecosystem protection, expansion and restoration (including carbon sinks) and 45 measures are related to marine environmental assessment, data gathering, monitoring and surveillance (Figure 8).

Conservation of marine ecosystems, including its carbon sink function, is now a key focus in SIDS's NDCs

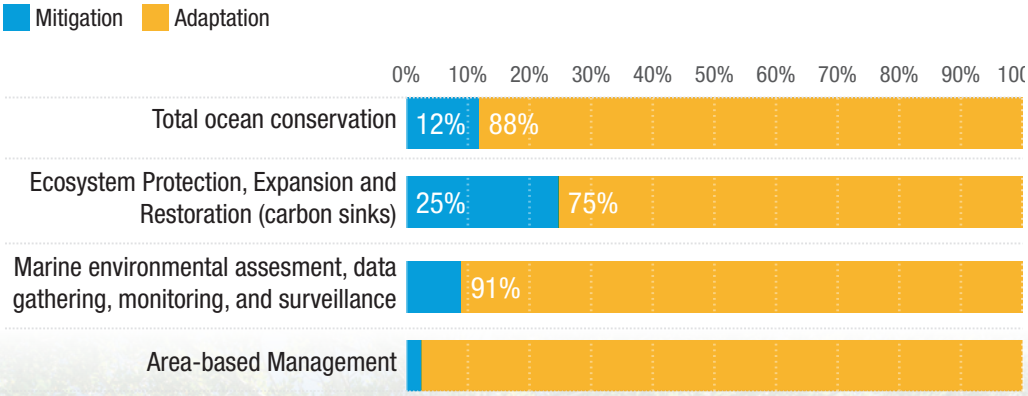
[24] For more information, see wwf.panda.org/wwf_news/?244770/Ocean-wealth-valued-at-US24-trillion-but-sinking-fast.

Figure 8.
Conservation measures in the nationally determined contributions of small island developing States place an emphasis on marine area-based management and ecosystems protection, including carbon sinks



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

Figure 9.
Adaptation efforts are the main form of conservation measures identified by small island developing States in their nationally determined contributions



Source: UNCTAD's analysis (2024) based on UNFCCC's NDC Registry.

The number of ABM measures outweighed the other subsectors, accounting for approximately 44 per cent of all conservation-related measures, while measures related to ecosystem protection accounted for 36 per cent of all conservation-related measures. Marine environmental assessment measures accounted for approximately 20 per cent of total conservation-related measures. The high number of conservation-related measures highlights the recognition by SIDS that they too have a responsibility to enhance efforts to establish effective conservation systems and a commitment to expand marine protected areas (MPAs) for both ocean conservation and carbon absorption purposes.

While mitigation measures accounted for 33 per cent of ocean economy measures, this share decreased to 12 per cent for conservation measures. Among conservation subsectors, the share of mitigation measures out of the total measures in the subsector ranged between 25 per cent for ecosystem protection, expansion and restoration (carbon sinks) and 2 per cent for ABM measures (Figure 9).

As for ocean economy, most ocean conservation measures are conditional (64 per cent), consistent with the average of total ocean measures (64 per cent) (see Figure 4 in Chapter 3).

5.1. Area-based management

ABM tools are pivotal strategies to designate and regulate specific geographic marine and coastal zones for conservation and economic activities. MPAs,[25] integrated coastal zone management plans (ICZMPs),[26] vulnerable marine ecosystems and ecologically or biologically significant areas[27] are all useful tools to protect marine biodiversity, in line with global frameworks such as the Kunming-Montreal Biodiversity Framework of 2022.[28] This framework calls for, among other objectives, the maintenance, enhancement or restoration of the integrity, connectivity and resilience of all ecosystems; substantially increasing the area of natural ecosystems by 2050; and targeting the effective conservation and management of at least 30 per cent of terrestrial and inland water areas, and marine and coastal areas. Currently, only about 7 per cent of the world's ocean is under some form of marine protection but less than 3 per cent of the global ocean is fully or highly protected.[29]

The establishment of MPAs could also benefit surrounding communities. For example, studies show that within five years of their creation, catches adjacent to five reserves in Saint Lucia increased between 46 and 90 per cent due to spillover effects (Roberts et al., 2001), also increasing the mean size of catches (Goñi et al., 2011). In addition, the benefits from tourism in a marine reserve more than doubles the value of the marine ecosystem,

[25] An MPA is "a geographically defined marine area that is designated and managed to achieve specific long-term biological diversity conservation objectives and may allow, where appropriate, sustainable use provided it is consistent with the conservation objectives". See www.un.org/bbnjagreement/sites/default/files/2024-08/Text%20of%20the%20Agreement%20in%20English.pdf.

[26] There is no internationally agreed definition of ICZMPs, but they can be generally understood as a process for the management of the coast using an integrated approach, regarding all aspects of the coastal zone, including geographical and political boundaries, in an attempt to achieve sustainability.

[27] An ecologically or biologically significant area is an "area of the ocean that has special importance in terms of its ecological and biological characteristics: for example, by providing essential habitats, food sources or breeding grounds for particular species". See www.cbd.int/marine/ebsa/booklet-05-sp-en.pdf.

[28] For more information, see www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf Final.pdf?_gl=1*h87l42*_ga*MTc3MzEwNjM3NC4xNjg0ODc3MTcy*_ga_7S1TPRE7F5*MTcxNDM4MDU3Ni40LjAuMTcxNDM4MDU3Ni42MC4wLjA.

[29] For more information, see the MPA Guide Marine Protection: https://mpatlas.org/mpaguide.

with more value arising from tourism than from fisheries (Sala et al., 2013).

SIDS have been at the forefront of implementing innovative ABM conservation measures. These measures not only aim to meet international biodiversity targets, such as the Aichi Biodiversity Target 11 adopted in 2010,[30] but also address local economic and environmental challenges. Including ABM pledges in SIDS's NDCs could significantly accelerate the achievement of target 3 of the Kunming-Montreal Biodiversity Framework for marine and coastal areas – which promotes the conservation of 30 per cent of terrestrial and inland water areas, and of marine and coastal areas by 2030[31] – due to the large size of their EEZs.

ABM tools, including MPAs, are one of four substantive elements of the recently adopted United Nations Treaty on Biodiversity in Areas Beyond National Jurisdiction (BBNJ Agreement). The new rules under the BBNJ Agreement define procedures and steps to establish ABM tools, including MPAs, by Member States. The regulations only apply to the high seas and must not include any areas within national jurisdiction. Many SIDS are located adjacent to vast expanses of the high seas and with the forthcoming implementation of the BBNJ Agreement, they will be well positioned to use these tools to safeguard the "marine commons".

This analysis of SIDS' NDCs found a total of 121 ABM measures. Only 2 per cent of ABM measures focus on mitigation, with the remaining 98 per cent focused on adaptation. In addition, 7 per cent of ABM measures incorporate a loss and damage approach. Sixty per cent of these measures were classified as conditional.

Among ABM measures, marine spatial planning (MSP) is explicitly referenced as a practical tool for integrated management in 40 per cent of cases. MSP has emerged as a crucial tool in the stewardship of the oceans, particularly in SIDS where the balance between environmental conservation and developmental needs is most acute. The attention paid by SIDS to MSP also stems from their global role in ocean stewardship because they collectively control 16.1 per cent of the world's total ocean EEZs (United Nations, 2024). As an integrative process, MSP aims to allocate marine areas for various human activities, harmonizing ecological, economic and social objectives. The process provides a framework for optimizing marine space use, facilitating the coexistence of development and environmental conservation objectives.

The evolution of MSP is marked by significant global milestones, from the initiation of technical workshops by the Intergovernmental Oceanographic Commission of UNESCO in 2006, to the more recent Joint Roadmap with the European Commission to accelerate MSP processes worldwide (UNESCO, 2023). By 2020, more than 300 MSP initiatives had been created, reflecting a diverse range of governance models (UNESCO, 2022). In regions like the Eastern Caribbean, several MSP initiatives have been undertaken and related research is on the rise (Mahadeo, 2022).

Overall, 27 SIDS have included ABM conservation measures in their NDCs, demonstrating the prominence given to natural marine assets by SIDS for climate adaptation purposes. Tonga (100 per cent) and Guyana (67 per cent) were the countries with the highest share of ABM measures as a total number of measures in their NDCs, while Belize (13 measures), Papua New Guinea and Cabo Verde (11 measures each) registered the highest number of individual ABM measures.

Among the measures included in its NDC, Tonga committed to expanding MPAs and special management areas to 30 per cent of the country's EEZ. The expansion of MPAs and special management areas is regarded

[30] For more information, see www.cbd.int/doc/strategic-plan/targets/T11-quick-guide-en.pdf.

[31] For more information, see www.cbd.int/gbf/targets.

by Tonga as an important step to achieve the two targets of preventing any permanent loss of land to rising sea levels on its four main islands and maintaining existing stocks of fish and other marine species. Belize focused on protecting coastal communities from damage caused by flooding and sea level rise. In this regard, it targeted the implementation of a "Land Use Policy and Policy Framework" to incorporate responsible and climate and water-sensitive development and land use. This policy also aims to promote and enhance land stewardship practices in local and Indigenous communities of Central America.

5.2. Ecosystem protection, expansion and restoration (including blue carbon sinks)

SIDS are increasingly implementing initiatives to protect, restore and sustainably manage marine and coastal ecosystems, engaging in efforts to enhance their mitigation and adaptation potential as part of the solution to climate change. Marine ecosystems have the potential to efficiently function as "blue carbon" sinks, which the Intergovernmental Panel on Climate Change defines as the biologically driven carbon storage in marine systems that can be managed.[32] These ecosystems include mangroves, tidal marshes, seagrass meadows and coral reefs.

Beyond their role in mitigating climate change, these ecosystems also enhance disaster risk reduction and support adaptation to climate change through ecosystem-based methods. In fact, they provide vital protection against coastal threats such as storms, waves, erosion and floods. For example, a 500 m wide mangrove forest can reduce wave height by 50 to 99 per cent (McIvor et al., 2013). In coastal cities and island communities, these ecosystems could also be crucial natural resources that significantly contribute to local economies, but they can often be undervalued or sub-optimally managed, leading to a decline in their ability to sequester carbon.

Blue carbon sinks are highly efficient at carbon sequestration (Liu et al., 2024). Although coastal habitats only occupy about two per cent of the total ocean area, they account for roughly half of the total carbon sequestered in ocean sediments. Experts estimate that as much as 1.02 billion tons of CO_2 are released annually from degraded coastal ecosystems, which is equivalent to 19 per cent of emissions from global deforestation (Khan et al., 2022). Moreover, several anthropogenic pressures such as population growth, urbanization, coastal development, pollution and the overexploitation of natural resources, including overfishing, further exacerbate the degradation of nearshore marine resources (UNDP, 2023).

Ocean economy measures related to ecosystem protection, expansion and restoration were the second most represented of the conservation measures, with 101 measures included in the NDCs of 28 SIDS. Most of the measures in this category focused on adaptation (75 per cent), while the remaining measures focused on mitigation (25 per cent). Out of the 101 measures identified, 67 per cent were conditional on the support of the international community for their implementation and only one measure was identified as a loss and damage response.

Fiji (55 per cent), Solomon Islands, Suriname and Cook Islands (50 per cent each) have the highest share of ecosystem protection, expansion and restoration measures as a total of the measures detailed in their NDCs. Belize (14 measures) and Mauritius (8 measures) registered the highest number of individual measures.

As an example of these measures, Fiji prioritized the conservation and protection of marine biodiversity and critical ocean

[32] For more information, see www.ipcc.ch/srocc/chapter/glossary.

ecosystems, including measures for promoting sustainable fishing practices, coastal protection, preservation and enhancement of mangroves, and engaging with coastal communities to promote sustainable practices and livelihoods. The Cook Islands focused on implementing strategies and policies with the objective of reducing and offsetting carbon emissions and strengthening climate resilience through, inter alia, coastal protection, water security and marine conservation.

5.3. Marine environmental assessment, data gathering, monitoring and surveillance

Robust marine environmental assessments and advanced monitoring techniques have been increasingly acknowledged as essential for the sustainable management of ocean resources, particularly for SIDS. These regions, characterized by extensive and diverse marine environments, face unique challenges and opportunities in the realm of marine ecosystems conservation. The application of science, technology and traditional knowledge is vital, not only for understanding marine biodiversity but also for implementing effective management measures such as ABM tools and environmental impact assessments. Methodologies and technologies required for data gathering, monitoring and surveillance are essential for informed and data-driven policymaking, equitable sharing of benefits derived from marine genetic resources (Harden-Davies et al., 2022) and for the management of species and ecosystems.

In addressing these needs, it is vital to consider the integration of traditional and local knowledge with contemporary scientific and technological advances. This approach not only enriches the understanding of marine environments but also fosters the participation of local communities, leveraging their insights for broader scientific and conservation efforts.

A total of 56 ocean conservation measures identified focused on marine environmental assessment, data gathering and monitoring and surveillance. Adaptation measures represented more than 90 per cent of all measures listed in this category in SIDS' NDCs. Conditional measures represented 68 per cent of submitted measures in this category. One measure was identified as being in response to loss and damage.

Out of the 17 SIDS that included measures related to marine environmental assessment, data gathering and monitoring and surveillance, Guinea-Bissau (33 per cent) and Belize (28 per cent) were the countries with the highest share of the total number of measures listed in their NDCs. Belize was also the country that listed the largest number of individual measures (16 measures), followed by Mauritius with 5 measures.

The NDC of Guinea-Bissau calls for support to enhance research capacity, with the aim of improving understanding of the functioning of coastal ecosystems and the effects of anthropogenic impacts, including climate change. This support is crucial for establishing a monitoring system, particularly in coastal areas. The country has reported delays in implementing vulnerability and risk assessments and securing sustained funding due to a lack of capacity and resources. The measures outlined by Belize in this category include the assessment of vulnerability of national coastal areas and of the impact of ocean acidification on coastal habitat and marine resources.

Chapter 6

Findings and way forward

Ocean measures included in SIDS' NDCs demonstrated a balanced approach between economic and conservation-related objectives. Adaptation to the effect of climate change was a central theme of these measures, as well as the need for international support for their implementation. Trade has only been marginally integrated into SIDS's NDCs, despite its vast potential in supporting ocean measures. In light of the next submissions coming in 2025, more homogeneous, comprehensive, measurable, actionable, and enforceable commitments could enhance investment in the ocean sectors. However, strengthening global partnerships and international cooperation mechanisms will also be crucial to provide SIDS the resources they need for the implementation of their NDCs. Trade should be further leveraged to strengthen ocean measures, especially for conservation, where its potential remains fully unexploited. UNCTAD, through its Sustainable Ocean-based Economies Classification and ocean dataset, as well as through the UNCTAD's Climate Trust Fund and its Ocean Economy and Fisheries Programme, provides valuable tools to support evidence-based policy making among SIDS.

This technical note explored how SIDS have integrated ocean economy and conservation measures into their NDCs. The four key findings of this research are:

1. Ocean measures are almost ubiquitous in SIDS' NDCs because oceans represent a vast space for climate action (70 per cent of the biosphere) and a fundamental resource for SIDS' economies and cultures. This technical note identified 606 measures with a clear focus on the oceans within 39 NDCs submitted by SIDS. However, these measures were part of highly diverse NDCs and often took the form of general objectives, descriptive plans, pledges and intentions, rather than enforceable commitments.
2. SIDS' NDCs have shown a relative balance in pursuing ocean economy and ocean conservation in their strategies for the oceans. In fact, 54 per cent of the ocean measures submitted focus on the ocean economy, while 46 per cent seek the conservation of the ocean space. As the line between economic and conservation measures can often be blurred, a more holistic approach to ocean measures can assist in ensuring that the diverse benefits of ocean resources (monetary and non-monetary) are maximized while maintaining ecological integrity and coordination between environmental, economic, trade, financial and infrastructure authorities.
3. Adaptation and conditionality were central in SIDS' NDCs, while loss and damage had a marginal role. The analysis revealed that SIDS have placed particular attention on adapting to the immediate effects of climate change and building long-term resilience through adaptive responses. In fact, adaptation measures represented 77 per cent of total ocean measures, while mitigation measures accounted for the remaining 23 per cent. Most of the measures (64 per cent) were also conditional on external support. Only 3 per cent of measures focused on loss and damage.
4. Trade played a marginal role in the ocean-related measures of SIDS' NDCs. Overall, only 20 per cent of ocean measures identified were considered trade related. Thirty-seven per cent of

There is urgency in transforming ocean measures in NDCs into more homogeneous, measurable, and enforceable policies, subject to global monitoring under the UNFCCC

ocean economy measures include a direct (7 cent) or indirect (30 per cent) reference to trade, while no trade references were found among ocean conservation measures. This highlights the potential for trade to play a bigger role in supporting, directly and indirectly, the ocean commitments made by SIDS in their NDCs. For a better integration of trade and climate action, it would be important to consider the significant differences between trade commitments in the World Trade Organization (WTO), or free trade agreements, and the measures submitted as part of the NDCs, in terms of specificity and legal effects. In fact, trade commitments in specific countries' schedules and accession protocols under the WTO are specific regarding, inter alia, national treatment, most-favoured-nation treatment, bound tariffs and the phasing out of relevant quotas and subsidies, and they are legally binding. In contrast, measures included in NDCs are more general in their scope and non-binding, representing a pledge rather than a commitment.

The following considerations have been envisaged to inform the discussion of Member States on a way forward:

1. There is a pressing need to transform ocean measures into more homogeneous, comprehensive, measurable, actionable, and enforceable policies, subject to global monitoring under the UNFCCC COP. This could involve setting clear modalities and a common framework for defining ocean measures within NDCs by describing specific targets and different levels of commitments (e.g., legally binding or not, bound or unbound commitment, best endeavour provision, conditionality, clear timelines and costs, etc.); expanding monitoring mechanisms; and integrating these commitments into national plans, administrative regulations and laws to ensure that they lead to meaningful environmental, social and economic co-benefits. Countries will also need to look at synergies and coherence with national adaptation plans that usually run in parallel and tend to focus even more on economic and infrastructure measures. With the opportunity to submit updated NDCs starting in 2025, there is a significant chance for countries to incorporate more comprehensive measures targeting the ocean economy. Enhanced commitments can drive more sustainable practices, encourage international investment and stimulate green/blue technology development and transfer in marine sectors. The UNFCCC Ocean and Climate Change Dialogue supports this process in cooperation with the fifth Ocean Forum on Trade related aspects of Sustainable Development Goal 14, led by UNCTAD in March 2025, and the UN Ocean Conference in June 2025.
2. Trade could be further leveraged in ocean economy measures and introduced as an enabling and implementing tool in conservation efforts. Due to their remoteness and limited land area, SIDS are often dependent on trade for key products and services. However, the role that trade could play in supporting ocean measures and their effects on trade flows were mentioned in only 20 per cent of the ocean economy measures included in SIDS's NDCs, and never for ocean conservation. For the former, leveraging trade tools like the Global System of Trade Preferences among developing countries can reduce trade cost for South-South trade in ocean-based goods by harmonizing most relevant non-tariff measures affecting participating SIDS' exports. For the latter, the Convention on International Trade in Endangered Species of Wild Fauna and Flora could provide an excellent example of how trade regulations can support ocean conservation measures.
3. UNCTAD's Sustainable Ocean-based Economies Classification and ocean dataset can be valuable tools for providing a greater understanding of the trade value of the ocean economy

measures. This classification system provided a structured and coherent framework to analyse, estimate and classify relevant measures in SIDS's NDCs and can also help future data collection, comparison and policy formulation across the ocean economy sectors, particularly where it is relevant to trade policy. The UNCTAD ocean dataset could be strengthened by developing CO_2 emission measurement methodologies and data in key sectors such as fisheries, transport and coastal and marine tourism.

4. The conditional nature of many commitments highlights the necessity for the international community to increase support to SIDS. Conditional measures are a clear list of areas where specific support is needed. To be effective, the commitments made by SIDS will require sustained financial assistance – and a rethink of the global financial architecture – technology transfers, a mechanism for implementation, hard and soft infrastructure support and technical expertise from the international community. Strengthening global partnerships and international cooperation mechanisms will be essential in enabling SIDS to implement their NDCs effectively and continue their path towards sustainable development and climate resilience. Upholding ODA commitments while increasing the amount of sustainable ocean-related ODA would represent an important achievement. Increased support for UNCTAD's Climate Trust Fund and its Ocean Economy and Fisheries Programme could support the design and implementation of more precise ocean economy targets in SIDS' NDCs, particularly when related to conditional measures.

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Annex I. Latest version of nationally determined contributions by small island developing States

The table below includes the list of the NDCs analysed for this technical note, followed by the year of submission and the version number. The NDCs listed were submitted by the 39 SIDS as of the end of September 2024. The individual NDCs may be accessed by clicking on the name of the State in the table below.

Nº	State	Year	Version	Nº	State	Year	Version
1	Antigua and Barbuda	2021	2	21	Micronesia (Federated States of)	2022	2
2	Bahamas	2022	2	22	Nauru	2021	2
3	Barbados	2021	2	23	Niue[33]	2016	1
4	Belize	2021	2	24	Palau	2016	1
5	Cabo Verde	2021	2	25	Papua New Guinea	2020	2
6	Comoros	2021	2	26	Samoa	2021	2
7	Cook Islands[34]	2016	1	27	São Tomé and Príncipe	2021	2
8	Cuba	2020	2	28	Singapore	2022	3
9	Dominica	2022	2	29	Saint Kitts and Nevis	2021	2
10	Dominican Republic	2020	2	30	Saint Lucia	2021	2
11	Fiji	2020	2	31	Saint Vincent and the Grenadines	2016	1
12	Grenada	2020	2	32	Seychelles	2021	2
13	Guinea-Bissau	2021	2	33	Solomon Islands	2021	2
14	Guyana	2016	1	34	Suriname	2019	2
15	Haiti	2022	2	35	Timor-Leste	2022	2
16	Jamaica	2020	2	36	Tonga	2020	2
17	Kiribati	2023	2	37	Trinidad and Tobago	2018	1
18	Maldives	2020	2	38	Tuvalu	2022	2
19	Marshall Islands	2020	3	39	Vanuatu	2022	3
20	Mauritius	2021	2				

[33] Niue is not a Member State of the United Nations, but it is a Party to the UNFCCC and the Paris Agreement. In this regard it deposited an NDC in 2016.

[34] Cook Islands is not a Member State of the United Nations, but it is a Party to the UNFCCC and the Paris Agreement. In this regard it deposited an NDC in 2016.

Annex II. Methodological construct and relevant definitions

For this note, measures are defined as "any State action contained within an NDC that intended to advance the submitting State's objectives on mitigation or adaptation". This definition is based on the discussion of measures and actions in the Paris Agreement, the UNFCCC and the language of the NDCs themselves.[35] To be considered an ocean measure, the measure itself or the objective it advances must make explicit reference to oceans or coastal activities and/or marine or coastal ecosystems, including mangroves. An exception to this rule of relying on explicit references in NDCs relates to tourism-related measures, which, in the case of SIDS, inherently incorporate the ocean due to the heavy reliance of their tourism industries on the ocean. As such, all measures addressing tourism in SIDS' NDCs are considered ocean measures.

Notably, SIDS' NDCs are highly diverse in their structure and design and the terms used across NDCs are not uniform. For instance, some States use "actions" and "measures" interchangeably, while others do not treat them as equivalents, or do not even label measures explicitly. Additionally, some NDCs treat "objectives", "goals" and "targets" as functionally the same. In determining what constitutes a measure or objective for the purposes of this note, the methodology aligns, as far as possible, with the intentions of the countries and prioritizes the categorization offered within the NDCs by the countries. This means that, if in its NDC a country explicitly names something as a "measure", an "objective", or their equivalent, the measure is categorized accordingly. Where an NDC is not explicit about categorization of an action, it is assumed to be a measure based exclusively on the text of the NDC and what could be understood from its plain meaning. Any language included in general sections, such as "background", "introduction", or similar report components, is excluded and not considered to be a measure of the NDCs.

Where a qualifying statement contains multiple distinct actions, each is counted as its own measure. Taking Fiji's NDC as an example, the State pledges to "prioritize the conservation and protection of its marine biodiversity and critical ocean ecosystems. This includes measures for promoting sustainable fishing practices, coastal protection, preservation, and enhancement of its mangroves, and engaging with coastal communities to promote sustainable practices and livelihoods" (Fiji, 2020). This note considers this sentence to contain five distinct ocean measures, namely: 1) promoting sustainable fisheries practices, 2) promoting coastal protection, 3) promoting preservation; 4) promoting enhancement of mangroves, and 5) engaging with coastal communities to promote sustainable practices and livelihoods.

As described in Chapter 2 and illustrated in Table 1, various ocean measures within each NDC are categorized according to horizontal and vertical variables. Horizontal variables apply across all sectors and SIDS. These variables assess the objectives and nature of ocean measures. Vertical variables address the measure's target sector, namely whether the measure targets the ocean economy (e.g. an

[35] For example, the UNFCCC calls for States to implement and publish "regional programmes containing measures to mitigate" and "measures to facilitate adequate adaptation to climate change" (United Nations Sustainable Development, 1992). Elsewhere, the UNFCCC has defined mitigation measures as, "specific domestic policies and actions that contribute to achieving mitigation objectives in NDCs" (UNFCCC, 2023b).

economic activity for sustainable use) or ocean conservation (e.g. protection of ecosystems). Within each sector, measures are further divided into subsectors.

Horizontal approach

In the first part of this note, the four horizontal variables related to the ocean measures are used for the analysis. These variables include climate-related objectives (i.e., mitigation and adaptation), the loss and damage response, the conditionality of the measures and their trade-relatedness. These four variables are not mutually exclusive with each other – meaning that a single measure can, for example, advance mitigation objectives, be conditional and relate to trade.

The measures' climate-related objectives are divided into two mutually exclusive categories based on the Paris Agreement's defined climate actions: mitigation or adaptation. While both measures can have co-benefits, for the purposes of this analysis, we classify them according to their primary purpose, as reflected in the stated intent of the State or the text of the NDC. These climate approach categories are defined as follows:

- Mitigation measures:[36] actions taken to reduce the number of emissions released into the atmosphere or to reduce the current concentration of CO_2 by enhancing carbon sinks (e.g., increasing the area of forests).[37]
- Adaptation measures:[38] actions focused on adjusting ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects. These measures include changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change.

Ocean measures are also assessed based on whether they address loss and damage. While there have been recent discussions over whether to treat loss and damage as a category distinct from adaption, that conversation has generally focused on informing the submissions of the upcoming third iteration of NDCs (UNFCCC Secretariat, 2024). Given that most of the NDCs reviewed treat the category of loss and damage as overlapping — not mutually exclusive — with climate objectives, the methodology has been developed accordingly. Moreover, because references to loss and damage are not included in all NDCs, the methodology classifies measures as addressing loss and damage only where an NDC explicitly states such measures are intended to advance a loss and damage approach. This approach aims to use the intention of the countries as the main element for evaluation. Consequently, it is possible that loss and damage measures might be underestimated.

- Loss and Damage measures:[39] actions addressing irreparable and irreversible adverse effects of climate change, including those related to both extreme weather events and slow onset events, such as sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, and loss of biodiversity, that lead to economic and non-economic losses.

The measures included in SIDS' NDCs are further evaluated based on their conditionality. To determine conditionality, this note looks first at the measure, to determine whether it is stated as conditional. If conditionality is not stated,

[36] For more information, see: https://unfccc.int/topics/introduction-to-mitigation.

[37] A small number of countries also marked measures aimed at expanding carbon sinks and carbon sequestration capacities as adaptation measures in their NDCs.

[38] For more information, see https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction#adaptation.

[39] For more information, see https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction#loss-and-damage.

then the measure is analysed to determine its conditionality. If this step offers no further clarification, the NDC as a whole is searched for any sweeping statements about conditionality. When an NDC indicates conditionality, the measure is marked as such, but when there is no mention of conditionality, the measure is marked as non-conditional. This binary approach sheds light on the reliance of SIDS on external assistance to implement ambitious climate action strategies. Measures are classified as follows:

- Conditional measures: measures that depend on receiving financial, technical, or other forms of support from the international community for their implementation.
- Non-conditional measures measures to be implemented based solely on the country's resources and capabilities, or not indicated as dependent on external assistance.

Finally, all measures are evaluated according to their relationship with trade and are divided into the following three categories:

- Explicit trade-related measures: measures explicitly using trade policy or instruments as a lever to impact international trade. This includes measures related or referring to imports, exports, tariffs, duties, quotas, non-tariff measures (i.e., technical measures, sanitary or phytosanitary measures, subsidies and import/export licenses), intellectual property and transfer of technology.
- Implicit trade-related measures: measures that have an implicit effect on international trade, covering, for example, measures pursuing broader objectives relating to countries' insertion into the global economy such as promoting economic diversification, connectivity, the incorporation of ocean economic policies or increasing renewable energy production.
- Non-trade-related measures: measures pursuing their objectives without the support of trade policy or instruments and with no impact on international trade.

Because all trade-related measures identified are also "ocean economy measures" and all ocean conservation measures analysed are considered as "non-trade-related measures", as discussed below, the trade-related measures are only discussed in Chapter 4 on ocean economy measures.

Vertical approach

In the second part of this note, measures are analysed according to vertical variables. Specifically, SIDS' ocean economy measures are divided into two main sectors, ocean economy and ocean conservation, and then divided into several subsectors.

Ocean economy categories are based on UNCTAD's previous work, where ocean economy is defined as "a vehicle toward a more sustainable and inclusive economic path on the marine and coastal environment [which] encompasses all industries that sustainably utilize and contribute to the conservation of ocean, seas, and coastal resources for human benefit in a manner that maintains all ocean resources over time" (UNCTAD, 2023c). UNCTAD has also designed a Sustainable Ocean-based Economies Classification, with a focus on tradeable ocean economy goods and services (UNCTAD, 2021b).

Ocean conservation categories are based on the most common instruments contained in NDCs. For this note, ocean conservation is defined as "the active management of the ocean's natural resources and environment to ensure their quality is maintained and that they are widely used."[40]

Although certain measures may simultaneously qualify as both ocean economy and ocean conservation measures, each one is classified as either

[40] This definition is based on UN Environment Programme's glossary. Available at https://leap.unep.org/en/knowledge/glossary/conservation#:~:text=The%20active%20management%20of%20the,that%20they%20are%20wisely%20used.%20.

an ocean economy or ocean conservation measure based on the NDC's explicit characterization or, if there is no explicit characterization, on the measures' most dominant characteristics and the plain meaning of the text. Ocean economy and ocean conservation measures – and their subsectors – are thus treated under this analysis as mutually exclusive.

A. Ocean economy measures: measures and practices aimed at using marine and coastal resources in a sustainable manner. Identifiable traits of such measures include that they are often "tradeable" and encompass management and harvesting actions aimed at preventing overexploitation, degradation and harm to marine species and marine ecosystems, ensuring their long-term health and productivity. This sector can be subdivided into four subsectors based on their nature:

1. Ocean-based goods measures:[41] measures targeting goods derived from the marine environment that contribute to the economy and human well-being. This category includes:

1.1. Marine fisheries, comprising wild catches of living marine species (vertebrates and invertebrates) for use in commercial and industrial products.

1.2. Aquaculture and hatcheries, comprising production output of onshore and offshore aquaculture (both marine and freshwater because production data does not differentiate between mariculture and aquaculture).

1.3. Ships, port equipment and parts thereof, comprising products that are directly relevant to shipping and ports activity.

2. Ocean-based services measures:[42] measures targeting private delivered services that make use of the marine natural capital or that apply or operate within the marine and coastal environment with a sustainable use purpose. Ocean-based services include the following components:

2.1. Marine and coastal tourism, comprising all activities whose principal aim is to provide facilities and services of ocean-related tourism and leisure.

2.2. Maritime transport and related services, comprising the transport of passengers and freight, port and other auxiliary services.

2.3. Coastal and marine environmental services, comprising environmental services that contribute to sustainable development of ocean, seas and marine resources and ecosystems by alleviating the negative impacts of economic activities.

2.4. Marine R&D and related services, comprising R&D in the fisheries and aquaculture sector, activities related to bioprospecting, biotechnology, medical and pharmaceutical science.

3. Energy-related measures: measures referring to the production of ocean renewable energy, such as offshore wind energy, tidal energy, ocean thermal energy and wave energy.

4. Cross-sectoral measures: measures with a broad economic scope that span multiple sectors and address

[41] Some ocean-based goods sectors as outlined in UNCTAD's Sustainable Ocean-based Economies Classification (seafood processing, sea minerals and high-technology and other manufactures not elsewhere classified) have not been included as part of the analysis because no reference to them has been found in SIDS' NDCs at this stage.

[42] Some ocean-based services sectors as outlined in UNCTAD's Sustainable Ocean-based Economies Classification (trade in fisheries services, port services, related infrastructure and logistical services) have not been included as part of the analysis because no reference to them has been found in SIDS' NDCs at this stage.

sustainability through comprehensive policies, regulations and initiatives that encourage cooperation and coordinated action across different areas of marine and coastal public management.

B. Ocean conservation measures: measures, instruments, tools and practices primarily aimed and designed to protect, preserve, manage and restore marine and coastal ecosystems and biodiversity. These measures usually include no-take measures or regulations[43] and aim to maintain the natural capital of the marine environment for its intrinsic value and ecosystem services and to support sustainable development. This sector includes the following subsectors:

1. ABM measures: measures advancing management tools for geographically defined areas "through which one or several sectors or activities are managed with the aim of achieving specific conservation objectives and certain sustainable use objectives".[44] While ABM tools can have both conservation and sustainable use objectives, for the purposes of this note they are treated as conservation measures because they usually fall within the competence of environmental and coastal management authorities and place significant limits on economic activities. This analysis treats MSP[45] as a tool for ABM. MSP is "a public process of analysing, allocating and regulating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives" (UNESCO, 2023).
2. Marine environmental assessment, data gathering, monitoring and surveillance measures: measures including services and processes to gather data, identify and evaluate the potential impacts of an activity on marine species and ecosystems, with the aim of informing decision-making and monitoring the implementation of said activities.
3. Ecosystem protection, expansion and restoration measures: measures focused on protection, expansion and restoration of marine or coastal ecosystems, including carbon sinks.

[43] No-take refers to the prohibition of removal or destruction of natural and cultural resources by activities such as fishing, mining, or drilling.

[44] See "terms used" in Article 1 of the Agreement Under the United Nations Convention on The Law of The Sea on The Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ Agreement) (2023). Available at: https://treaties.un.org/doc/Treaties/2023/06/20230620%2004-28%20PM/Ch_XXI_10.pdf

[45] For more information, see https://www.ioc.unesco.org/en/marine-spatial-planning

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