COASTAL AND MARINE ECOSYSTEMS AS NATURE-BASED SOLUTIONS IN NEW OR UPDATED NATIONALLY DETERMINED CONTRIBUTIONS

Final Analysis - As of September 2023

OCEAN & CLIMATE PLATFORM

CONSERVATION INTERNATIONAL

rare

IUCN

WWF

The Nature Conservancy

Wetlands INTERNATIONAL

Recommended Citation

Lecerf, M., Herr D., Elverum, C., Delrieu, E. and Picourt, L., (2023), Coastal and marine ecosystems as Nature-based Solutions in new or updated Nationally Determined Contributions, Ocean & Climate Platform, Conservation International, IUCN, Rare, The Nature Conservancy, Wetlands International and WWF.

Acknowledgements

This analysis was coordinated by Loreley Picourt (Ocean & Climate Platform) and co-authored by Marine Lecerf (OCP), Esther Delrieu (OCP), Dorothée Herr (IUCN), and Claire Elverum (Conservation International). The 2023 revision of the document was coordinated by Marine Lecerf (OCP).

The writing team was supported and the analysis reviewed by Anete Berzina-Rodrigo (IUCN), Karen Douthwaite (WWF), Minna Epps (IUCN), Maddie Fry (CI), Luz Gil (The Nature Conservancy), Beatriz Granziera (TNC), Jill Hamilton (CI), Charles Karangwa (IUCN), Emily Landis (TNC), Shirley Matheson (WWF), Pauli Merriman (WWF), Tabitha Muriuki (Wetlands International), Victoria Romero (IUCN), Lisa Schindler Murray (Rare), Dorsa Sheikholeslami (IUCN), Susanna Tol (Wetlands International), Julika Tribukait (WWF), and Adriana Vidal (IUCN).

The co-authors would also like to thank the following experts for their external review, expert opinion and valuable contributions: Dr Robert Blasiak (Stockholm Resilience Centre), Courtney Durham (Pew Charitable Trust), Sylvie Goyet (FPA2), Thomas Hickey (Pew Charitable Trust), Kirsten Isensee (IOC-UNESCO), Anna-Marie Laura (Ocean Conservancy), Olivia Lopez (Ocean Conservancy), Rémi Parmentier (Because the Ocean initiative), Dr Torsten Thiele (Global Ocean Trust) and Dr Anna Zivian (Ocean Conservancy).

A special thanks to Eliott Valverde and Antoine Cahn (OCP) for their support in reviewing Nationally Determined Contributions and drafting all the maps provided in the present analysis.

The writing and review of the document was made possible through the generous support of the Save Our Mangroves Now! Initiative - funded by the Federal German Ministry for Economic Cooperation and Development (BMZ), Oceankind, the French Agency for Development (AFD) and French Office for Biodiversity (OFB):

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

OFB OFFICE FRANÇAIS DE LA BIODIVERSITÉ

oceankind

Cover picture: © Toby Matthews
This document was designed by Natacha Bigan.

The co-authors would also like to recognise and thank the additional individuals for their inputs, feedback and review of the first two versions of this report, published respectively in June and October 2021: Moushumi Chaudhury (TNC), Maggie Comstock (CI), Françoise Gaill (OCP), Kiryssa Kasprzyk (CI), Thilanka Seneviratne (GIZ), Cinthia Soto (Wetlands International) and John Verdieck (TNC).

Disclaimer

ACRONYMS

BTR: Biennial Transparency Report

CBD: Convention on Biological Diversity

CO2: Carbon dioxide

COP: Conference of Parties

DPRK: Democratic People's Republic of Korea

DESA: UN Department of Economic and Social Affairs

DRC: Democratic Republic of Congo

EbA: Ecosystem-based Adaptation

EEZ: Exclusive Economic Zone

GBF: Global Biodiversity Framework

GHG: Greenhouse Gas Emission

GST: Global Stocktake

ICTU: Information to facilitate Clarity, Transparency and Understanding

IGO: Intergovernmental Organization

INDC: Intended Nationally Determined Contributions

IPCC: Intergovernmental Panel on Climate Change

IP: Indigenous Peoples

IUCN: International Union for Conservation of Nature

LC: Local Communities

LMMA: Locally Managed Marine Areas

LULUCF: Land Use, Land-Use Change and Forestry

MSP: Marine Spatial Planning

MPA: Marine Protected Areas

NAP: National Adaptation Plans

NbS: Nature-based Solutions

NDC: Nationally Determined Contribution

OECM: Other effective area-based conservation measures

RCP: Representative Concentration Pathway

REDD: Reducing Emissions from Deforestation and Forest Degradation

SDG: Sustainable Development Goal

SIDS: Small Island Developing States

SROCC: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate

UN: United Nations

UNEA: United Nations Environment Assembly

UNFCCC: UN Framework Convention on Climate Change

KEY TERMINOLOGY

Nature-based Solutions (NbS) are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem service". Adopted at the fifth session of the United Nations Environment Assembly (UNEA-5) in 2022, this internationally-agreed definition recognises the important role NbS play in the global response to climate change and its social, economic and environmental effects. It is largely based on the definition of the International Union for Conservation of Nature (IUCN), endorsed by its members in 2016.

Building on the definition above, **Nature-based Solutions in coastal and marine ecosystems** (i.e. coastal and marine NbS) are actions to protect, sustainably manage and restore coastal and marine ecosystems in ways that address societal and ecological challenges effectively and adaptively. Coastal and marine NbS in the context of climate change are based on the ability of coastal and marine ecosystems to sequester carbon dioxide (CO_2) and/or their ability to foster adaptation and resilience of communities and ecosystems, by acting as buffers against climate change impacts while generating socio-economic benefits such as improving livelihoods.

Ocean-based solutions refer to the opportunities offered by - and related to - the global ocean to "address the causes of global climate change either [by] reduc[ing] anthropogenic greenhouse gas emissions or [by] increas[ing] their long-term removal from the atmosphere"[2] and adapt to its impacts. It includes areas of focus such as protecting and/or restoring coastal blue carbon ecosystems, deploying marine renewable energy, enhancing sustainable and climate-ready aquatic food systems, developing sustainable coastal tourism and greening the shipping sector[3]. While coastal and marine NbS aim to achieve biodiversity conservation and socio-economic benefits, the sole objective of ocean-based solutions is climate mitigation and adaptation.

Blue carbon is "the carbon stored in coastal and marine ecosystems"[4]. **Blue carbon ecosystems** (namely mangroves, seagrasses and salt marshes) sequester and store large quantities of carbon. In addition, these ecosystems provide multiple services to local populations such as climate adaptation benefits. The term "blue carbon" is also increasingly being applied to other ecosystems beyond mangroves, seagrasses and salt marshes, such as macroalgae (i.e. seaweed and kelp), and potential mitigation benefits that may be achieved by protection of these places. However, at this time, only mangroves, seagrasses and salt marshes have guidance approved by the Intergovernmental Panel on Climate Change (IPCC) on the measurable extent to which they can contribute to a country's emission reduction efforts (i.e. the 2013 Wetlands Supplement)[5].

Ecosystem services are the beneficial interactions of ecosystems to human populations[6]. Coastal and marine ecosystem services include: provisioning services (e.g. fisheries, building materials); supporting services (e.g. life-cycle maintenance for both fauna and local communities, element and nutrient cycling); regulating services (e.g. carbon sequestration and storage, erosion prevention, waste-water treatment, moderation of extreme events); and cultural services (i.e. tourism, recreational, aesthetic, and spiritual benefits).

1/ IUCN (2016). Defining Nature-based Solutions. WCC-2016-Res-069-EN.

2/ Gattuso, J.-P., et al. (2018). Ocean Solutions to Address Climate Change and Its Effects on Marine Ecosystems.

3/ World Resources Institute (2021). 4 Ocean-based Solutions to Advance Climate Action Through NDCs.

4/The Blue Carbon Initiative (2023a). Guidelines for Blue Carbon and Nationally Determined Contributions.

5/ IPCC (2014a). 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, Hiraishi T, Krug T, Tanabe K, Srivastava N, Baasansuren J, Fukuda M, and Troxler TG. (eds). Published: IPCC, Switzerland.

6/ OCEAN AND CLIMATE (2015). Ecosystem Services and Marine Conservation, Ocean and Climate Platform.

TABLE OF CONTENTS

Purpose of this report

The first revision cycle of Nationally Determined Contributions (NDCs) offers an opportunity for Parties to make greater use of coastal and marine NbS in their national strategies and actions. In the context of growing attention given to ocean-related measures in climate strategies and actions over the last eight years, **the present report takes a deep dive into new or updated NDCs, looking at the extent to which Parties to the Paris Agreement have included NbS in coastal and marine ecosystems as part of their climate mitigation and/or adaptation measures. Additionally, this report further considers whether Parties have increased, renewed, unchanged or decreased their ambition with regards to the inclusion of coastal and marine NbS between the first and updated NDCs.**

This report follows a **three-step publication process**: (1) the provisional draft published after the UNFCCC intersessions (June 2021), which covered the 63 NDCs submitted until 8 June 2021; (2) the interim draft published at UNFCCC COP 26 (November 2021), which reviewed the 118 NDCs submitted until 21 October 2021; and (3) *the present and final report* that includes the 148 NDCs submitted by 1 October 2023[7]. Indeed, a total of 147 countries and the EU-27[8] (i.e. hereafter referred to as 148 countries) have officially submitted their new or updated NDCs between 29 March 2019 and 1 October 2023 (Table 1). This report analyses these submissions to quantitatively and qualitatively assess whether and how coastal and marine NbS have been included within the new or updated NDCs, as well as in comparison with first NDCs.

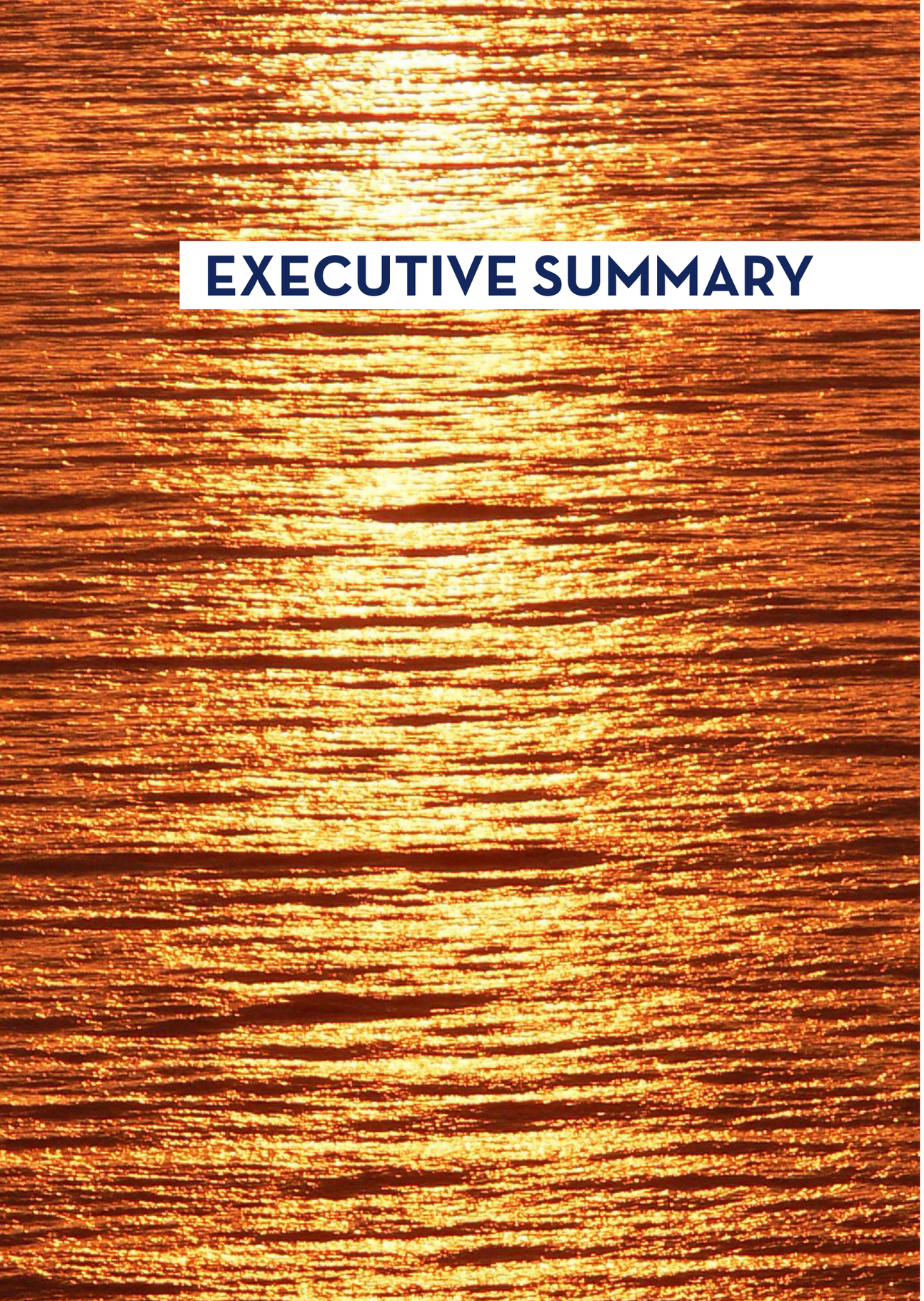
This whole analysis fits in with the ambition loop (i.e. the positive feedback loop in which bold government policies and non-state actor leadership reinforce each other to ratchet up ambition), informing and taking stock to support transformational change. As such, it also serves as an input to the first Global Stocktake (GST), that is to conclude at COP 28 in Dubai (30 November - 12 December 2023).

Disclaimer

The analysis in this report focuses exclusively on countries that have integrated coastal and marine NbS in their new or updated NDCs (as of 1 October 2023). Countries that did not refer explicitly to coastal and marine NbS in their new or updated NDCs, despite including other ocean-based measures such as offshore renewable energy or emission-reduction measures for shipping, have not been included.

7/ Some countries have amended their updated NDCs, with the publication of a revised or a complementary text (e.g. Australia, Republic of Korea, United Kingdom). Such amendments were taken into account in this publication, which can explain the changes between the different versions.

8/ The 27 European Union (EU) member countries: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.



EXECUTIVE SUMMARY

In the context of growing attention to ocean-related measures in climate strategies, it is key to assess the inclusion of coastal and marine ecosystems as NbS in new or updated NDCs.

The report examines 148 new or updated NDCs, submitted as part of the first revision cycle, with regard to the inclusion of efforts addressing coastal and marine NbS for climate mitigation and/or adaptation:

- Out of 148 countries that have submitted their NDCs as of 01 October 2023, ***97 have included coastal and marine NbS***. Among these, 61 countries included coastal and marine NbS for both mitigation and adaptation purposes, 1 for mitigation only and 35 for adaptation only.

- Out of these 97, ***55 countries recognised the mitigation and adaptation co-benefits*** of coastal and marine NbS, and 44 noted the resultant socioeconomic benefits for coastal communities.

- In terms of means to enhance coastal and marine NbS in NDCs (i.e. feasibility, societal engagement and transparency), ***68 countries are explicitly committed to creating enabling conditions*** for action - such as research, technology transfer, capacity-building and finance mobilisation.

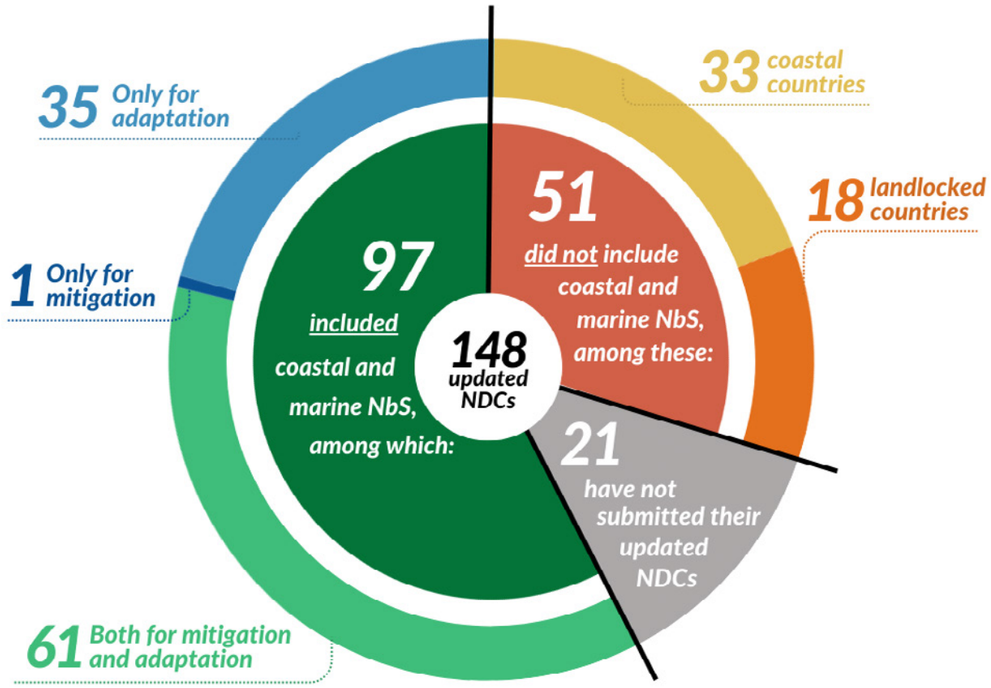


Fig.1: Overview of coastal and marine NbS as mitigation and/or adaptation measures in new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

Action Types	Countries (out of 148 submissions)
I. Coastal and marine NbS Countries that included coastal and marine NbS in their new or updated NDC	97 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cameroon, Canada, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominica, Dominican Republic, Democratic Republic of Congo (DRC), Ecuador*, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, India, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Peru, Philippines*, Qatar, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Uruguay, Vanuatu, Venezuela, Vietnam
a. NbS for both Mitigation and Adaptation Countries that included coastal and marine NbS in both mitigation and adaptation efforts	61 countries: Angola, Antigua and Barbuda, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, Indonesia, Kenya, Kiribati, Kuwait, Liberia, Maldives, Mauritius, Mexico, Mozambique, Myanmar, Namibia, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Timor-Leste, Tonga, Tuvalu, United Arab Emirates, United Kingdom, United States, Vanuatu, Viet Nam
b. NbS only for Mitigation Countries that included only coastal and marine NbS in mitigation efforts	1 country: Nicaragua
c. NbS only for Adaptation Countries that included only coastal and marine NbS in adaptation efforts	35 countries: Albania, Australia, Cameroon, Canada, Comoros, Congo, Côte d'Ivoire, Dominica, DRC, Ecuador*, Egypt, Gambia, India, Jordan, Lebanon, Malaysia, Marshall Islands, Mauritania, Micronesia, Morocco, Nauru, Peru, Philippines*, Qatar, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Solomon Islands, Somalia, South Africa, Togo, Tunisia, United Republic of Tanzania, Uruguay, Venezuela
II. No coastal and marine NbS Countries that have submitted their new or updated NDCs but did not include coastal and marine NbS	50 countries and the European Union: Andorra, Armenia, Belarus, Bhutan, Bolivia, Bosnia Herzegovina, Brazil, Burkina Faso, Burundi, Central African Republic, Chad, Democratic People's Republic of Korea (DPRK), Eswatini, Ethiopia, European Union (27 countries), Georgia, Ghana, Grenada, Holy See*, Israel, Jamaica, Japan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Malawi, Mali, Monaco, Mongolia, Montenegro, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Republic of Macedonia, Republic of Moldova, Rwanda, Serbia, South Sudan*, State of Palestine, Switzerland, Tajikistan, Thailand, Turkey, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe
a. Coastal countries Countries that have a coastline but did not include coastal and marine NbS	32 countries and the European Union: Bosnia Herzegovina, Brazil, Democratic People's Republic of Korea (DPRK), European Union (27 countries), Georgia, Ghana, Grenada, Israel, Jamaica, Japan, Monaco, Montenegro, New Zealand, Norway, Oman, State of Palestine, Thailand, Turkey, Ukraine
b. Landlocked countries Countries without access to the sea that could not include coastal and marine NbS	18 countries: Andorra, Armenia, Belarus, Bhutan, Bolivia, Burkina Faso, Burundi, Central African Republic, Chad, Eswatini, Ethiopia, Holy See*, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Malawi, Mali, Mongolia, Nepal, Niger, Paraguay, Republic of Macedonia, Republic of Moldova, Rwanda, Serbia, South Sudan*, Switzerland, Tajikistan, Uganda, Uzbekistan, Zambia, Zimbabwe
III. NDCs not submitted yet Countries that have not submitted their updated NDCs yet, or that did not provide an English translation	21 countries[9]: Afghanistan[10], Algeria, Azerbaijan, Botswana, Cook Islands, Djibouti, Eritrea, Guyana, Iran, Iraq[11], Lesotho, Liechtenstein, Madagascar, Niue, Palau, Russian Federation, Saint Vincent and the Grenadines, San Marino, Syria, Trinidad and Tobago, Turkmenistan[12]

Countries marked with an asterisk in this analysis refer to countries that submitted a new NDC, i.e. initial NDC submitted between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*)

Table 1. Coastal and marine NbS as part of new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

9/ Among the 21 countries that have not submitted their updated NDCs yet, 7 included coastal and marine NbS for mitigation and/or adaptation in their first NDCs (i.e. Cook Islands, Djibouti, Eritrea, Guyana, Madagascar, Niue, Saint Vincent and the Grenadines).

10/ Countries highlighted in orange in tables indicate landlocked countries.

11/ The NDC of Iraq is not included in the analysis, due to the lack of English translation on the UNFCCC NDC Registry.

12/ The NDC of Turkmenistan is not included in the analysis, due to the lack of English translation on the UNFCCC NDC Registry.

In addition, the present report provides a **robust comparison** between first NDCs and updated NDCs, showcasing whether countries have increased, renewed, unchanged or decreased their ambition between first and second submissions.[13] In first NDCs, 68 out of 142 countries14 included coastal and marine NbS for mitigation and/or adaptation purposes. In comparison, 93 out of 142 countries[14] included relevant coastal and marine NbS in their updated NDCs. The comparative analysis therefore suggests an **overall increase**, albeit modest, in recognition of the ocean's role in climate action, and in countries' level of ambition with regards to leveraging coastal and marine NbS for climate mitigation and adaptation, specifically:

- ***More references to the ocean in updated NDCs***, i.e. countries further recognised ocean changes (e.g. acidification, coral bleaching) and/or climate-driven impacts on the ocean (e.g. sea-level rise, coastal erosion). Compared to the first NDCs, 14 out of 142 countries have added such references.

- ***New coastal and marine NbS*** as mitigation and/or adaptation efforts in updated NDCs. More than half of the countries that submitted their updated NDCs have increased their ambition in comparison to their first NDCs, since 80 out of 142 countries added new coastal and marine NbS.

- ***Additional quantitative targets to support the implementation of coastal and marine NbS***, since 33 countries have added numerical targets (e.g. percentage of coastal wetlands to be protected, hectares of mangroves to be restored, emission reduction targets related to blue carbon).

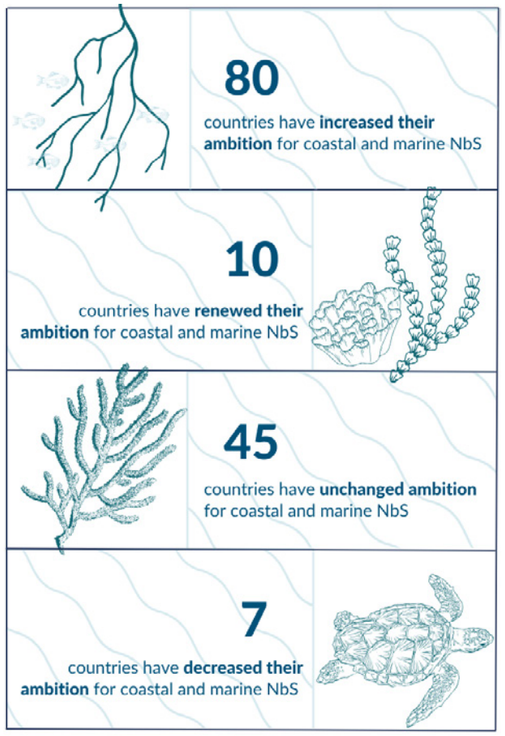


Fig. 2: Countries' level of ambition on the overall inclusion of coastal and marine NbS between their first and updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform

13/ ***An increase in the level of ambition***: the country included at least one coastal and marine NbS in its updated NDC, but did not include any in its first NDC. ***A renewed level of ambition***: the country included at least one coastal and marine NbS in both its first and updated NDCs. ***A decrease in the level of ambition***: the country did not mention coastal and marine NbS in its updated NDC, but included at least one coastal and marine NbS in its first NDC. ***An unchanged level of ambition***: the country omitted coastal and marine NbS in both its first and updated NDCs (e.g. landlocked countries). This terminology is further explained in the methodology section at the very end of this report.

14/ 6 countries (i.e. Brunei Darussalam*, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*) only have one submission, which was submitted between 29 March 2019 and 1 October 2023 - hereafter referred to as 'new' NDC. These countries were therefore not considered in the comparative analysis, changing the total of 148 countries under study (i.e. having submitted their new NDCs, and first and updated NDCs) to 142 countries (i.e. having submitted their first and updated NDC only).

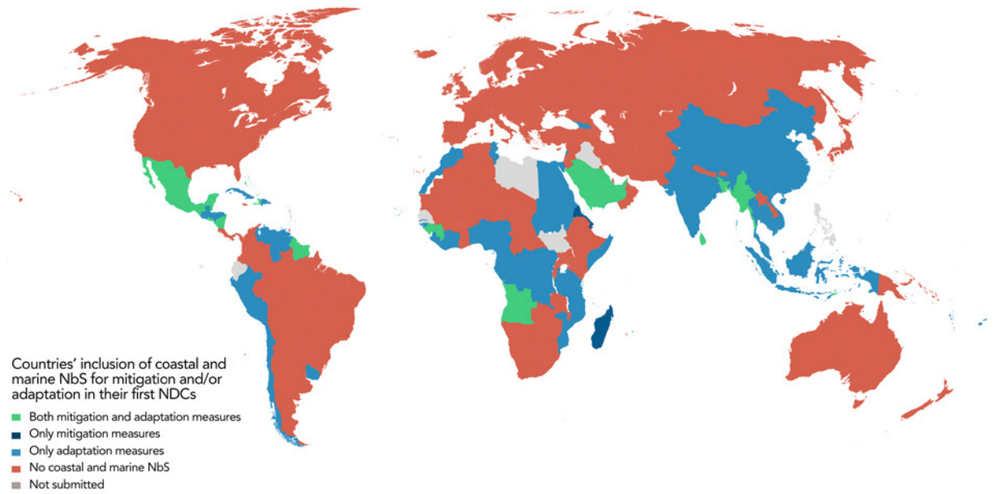


Fig. 3: Countries' inclusion of coastal and marine NbS for mitigation and/or adaptation in their first NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform via MapChart

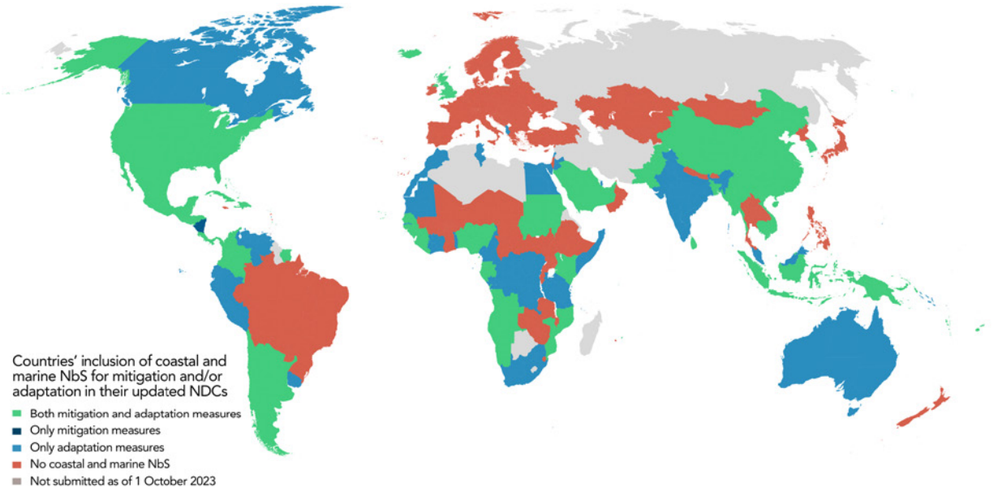


Fig. 4: Countries' inclusion of coastal and marine NbS for mitigation and/or adaptation in their updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform via MapChart

INTRODUCTION

The Nationally Determined Contribution revision cycle under the Paris Agreement

The Paris Agreement adopted by 196 Parties to the United Nations Framework Convention on Climate Change (UNFCCC) at the 21st Conference of the Parties (COP 21) on 12 December 2015, commits to take action to limit global temperature rise to "well below" 2°C and pursue efforts to limit it to 1.5°C (Article 2). In addition, the Agreement sets out to strengthen the global climate change response, increasing the ability to adapt to adverse impacts of climate change and foster climate resilience (Article 7).

At the core of the Paris Agreement, the Nationally Determined Contributions (NDCs) are a key tool to achieve these mitigation and adaptation objectives. As an innovative and bottom-up approach, NDCs combine voluntary and legally binding elements that enable governments to have the flexibility needed to detail and submit country-level plans to address climate change based on the country's context, capacity and flexibility. Communicated every five years, NDCs periodically demonstrate Parties' mitigation and adaptation intentions, while also describing how the NDCs will be achieved. The NDC cycle (Fig. 5) provides an opportunity for Parties to update[15], assess and review their national climate commitments, as each successive NDC is required to showcase increased ambition compared to the previous NDC (Article 4.3).

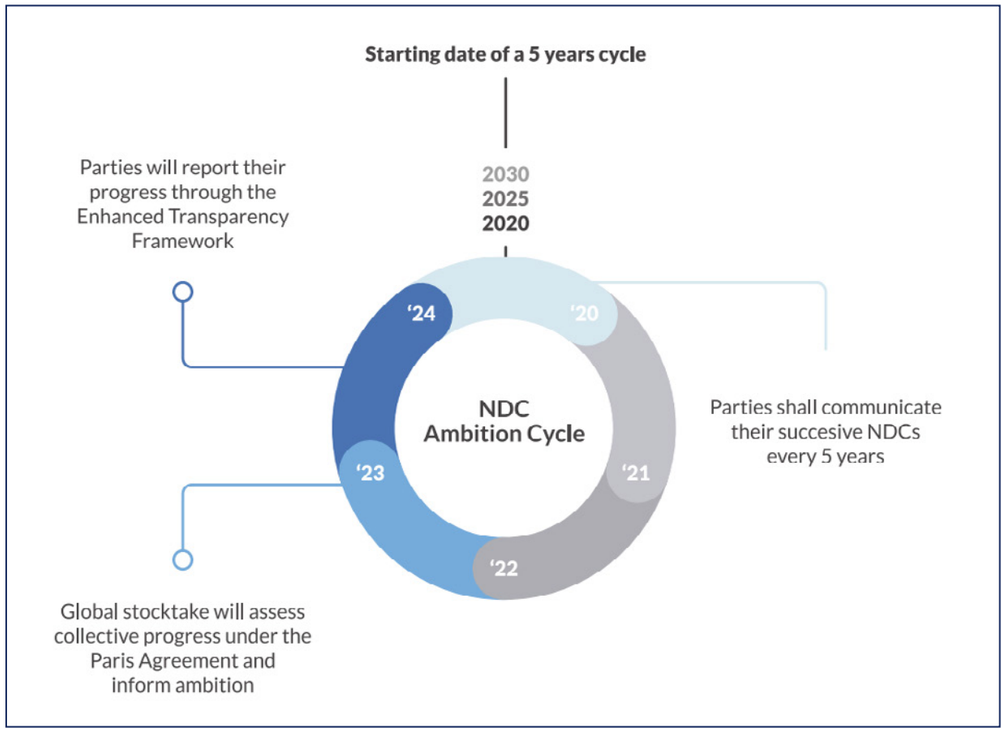


Fig. 5: The NDC ambition cycle (Source: Adapted from a presentation by Joanna Post, UNFCCC Secretariat, at the Because the Ocean workshops held in Madrid and Suva, April-May 2019)[16]

15/ Fransen, T., et al. (2019). Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020, Washington, DC: World Resources Institute.

16/ Because the Ocean (2019). Ocean for Climate: Ocean-Related Measures in Climate Strategies.

The growing inclusion of coastal and marine Nature-based Solutions in climate strategies

In 2015, when countries submitted their intended NDCs (INDCs), ahead of and immediately following the 2015 UNFCCC COP 21 in Paris,[17] 112 out of 161 NDCs (i.e. 70%)[18] acknowledged climate change vulnerability of coastal and marine ecosystems and communities and the role of ocean-based solutions[19] for mitigation and adaptation - including coastal and marine NbS, as well as other ocean-based solutions such as marine renewable energy and shipping-related measures within the scope of the Paris Agreement.[20] However, despite the many ocean-inclusive NDCs, many did not commit to concrete measures. For instance, only 19% of Parties with coastal wetland ecosystems included them in their first NDC for mitigation, recognising their carbon storage and sequestration values.[21] This NDC ambition gap[22] indicates a need for improved communication around options for specific targets, actions and next steps to be taken around identified ocean-based solutions.[23,24] These solutions go hand-in-hand with drastic measures to reduce greenhouse gas (GHG) emissions across the economy.

Since then, the ocean has been receiving growing attention at the climate negotiations. A number of state-led initiatives (e.g. Because the Ocean initiative, Ocean Pathway Partnership, High-level Panel for a Sustainable Ocean Economy) and coalitions from civil society, UN agencies and intergovernmental organisation (IGOs) (e.g. Ocean & Climate Platform) emerged to voice the important role of the ocean in regulating the global climate system[25] and advocate for a better inclusion of the ocean under the Paris Agreement and UNFCCC processes. For instance, since 2015, country signatories to the Because the Ocean Declaration have paved the way by encouraging greater inclusion of ocean-based measures within the scope and implementation of NDCs, National Adaptation Plans (NAPs), and Adaptation Communications.[26,27] Out of the 23 signatories of the first Declaration, 17 have adjusted their NDCs accordingly and integrated ocean-based measures.[28]

Furthermore, significant progress has been achieved in terms of generating and compiling scientific knowledge (e.g. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC), IPCC Sixth Assessment Report, process of UN Decade of Ocean Science for Sustainable Development and the UN Decade of Ecosystem Restoration), mobilising civil society under the UNFCCC Marrakech Partnership (i.e. Global Climate Action Agenda - Ocean and Coastal Zones Group), and policy mainstreaming (e.g. Ocean and Climate Change Dialogue under the Subsidiary Body of Scientific and Technological Advice).

Identified as "low-regret options"[29] local coastal and marine NbS offer significant and cost-effective mitigation and adaptation measures, while providing multiple co-benefits to communities and ecosystems. For instance, services provided by mangrove habitats to human livelihoods are estimated to be worth at least $USD 1.6 billion annually.[30] While contributing to climate change mitigation and adaptation, coastal and marine NbS also have the potential to contribute greatly to a suite of Sustainable Development Goals (SDGs) including SDG 14 to "sustainably manage and protect marine and coastal ecosystems", as well as other global goals (e.g. food security, access to water, clean energy, sustainable cities and climate change).[31]

Adopting and scaling-up coastal and marine NbS can, for some countries, act as a multi-purpose solution for climate mitigation and adaptation.[32] They have the potential to enhance systemic integration, connecting across climate and biodiversity goals.[33] It is crucial to ensure that climate action is complementary to, rather than in conflict with, biodiversity conservation. To do so, net-zero targets (i.e. efforts to cut GHG emissions as close to zero as possible) must be aligned to the long-term goals of the Paris Agreement and be biodiversity-positive, or at least biodiversity-neutral.[34] As witnessed during the negotiations of the Kunming-Montreal Global Biodiversity Framework under the Convention on Biological Diversity (CBD), adopted at CBD COP 15 in December 2022, there is a growing interest and willingness in the climate-biodiversity nexus - with the objective to address climate change and biodiversity loss as one crisis. For instance, commitments to protect hectares of mangroves are not only a climate measure to sequester blue carbon and protect the shorelines, but also a conservation measure to sustain natural habitats.

17/ Prior to and during UNFCCC COP 21, in 2015, 163 countries submitted their intended NDCs (INDCs), and 81 countries published their first NDC. In absence of such publication, INDCs were automatically counted as the country's first NDC at the ratification of the Paris Agreement.

18/ Gallo, N., et al. (2017). Ocean commitments under the Paris Agreement. Nature Climate Change. 7.

19/ Northrop, E., et al. (2020). Enhancing Nationally Determined Contributions: Opportunities for OceanBased Climate Action Working Paper. Washington, DC: World Resources Institute.

20/ Gallo, N., et al. (2017)

21/ Herr, D., & Landis, E., (2016). Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Policy Brief. Gland, Switzerland: IUCN and Washington, DC, USA: TNC.

22/ UNEP (2022). Emissions Gap Report. United Nations Environment Programme, Nairobi.

23/ Von Unger, M., et al. (2020). Blue NbS in NDCs. A booklet for successful implementation (GIZ 2020).

24/ UNFCCC (2021). Synthesis Report. Nationally determined contributions under the Paris Agreement. FCCC/PA/CMA/2021/8. p1-42.

25/ OCEAN AND CLIMATE (2019a). Scientific Fact Sheets, Ocean and Climate Platform, p.1-130.

26/ Because the Ocean (2015). First Because the Ocean Declaration.

27/ Because the Ocean (2019)

28/ The remaining countries include Aruba - unable to submit, Palau and 4 EU countries (i.e. France, Netherlands, Spain and Sweden).

29/ Magnan, A.K., et al. (2018). Ocean-based measures for climate action. IDDRI, Policy Brief N°06/18.

30/ *Ibid*

31/ IPBES-IPCC (2021). IPBES-IPCC Co-Sponsored Workshop Report on Biodiversity and Climate Change.

32/ IUCN (2020). Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS.

33/ Diz, D., et al. (2021). Blueprint for a Living Planet: Four Principles for Integrated Ocean-Climate Strategies.

34/ Deprez, A., et al. (2021). Aligning high climate and biodiversity ambitions in 2021 and beyond: why, what, and how? IDDRI, Study N°05/21.

COASTAL AND MARINE NATURE-BASED SOLUTIONS IN MITIGATION EFFORTS

Reducing GHG emissions, in particular CO_2 emissions, and enhancing carbon sequestration through NbS are essential to maintain the health of marine life, as well as the climate regulating functions and other ecosystem services provided by the ocean.[35] They are currently the only scientifically-proven options to mitigate ocean warming, acidification, deoxygenation, sea level rise, impacts of extreme weather events and destruction of particularly sensitive ecosystems at a global scale.[36]

Protecting, restoring and conserving coastal "blue carbon" ecosystems (i.e. mangroves, salt marshes and seagrasses) is particularly effective to mitigate climate change, since they have a high capacity for CO_2 sequestration and storage.[37] Despite covering only 2% of the total ocean area, these ecosystems account for approximately 50% of the total carbon sequestered in ocean sediments.[38] For instance, mangrove ecosystems alone store around 6.23 gigatons of carbon worldwide[39] - and these rates are about two to four times greater than global rates observed in other mature tropical forests.[40] Other coastal ecosystems (e.g. kelp forests, algae, soft-bottom benthic habitats)[41] are also recognised for the role they play in the global carbon cycle. However, the measurable amount by which they remove carbon from this cycle is still being assessed and not yet recognised by IPCC-approved methodologies[42] - making it in turn more difficult to determine the extent of their mitigation capacity and to include them in mitigation strategies.

Thus, coastal and marine NbS can be an important part of countries' mitigation strategies to meet the goals of the Paris Agreement.[43] They have the potential to be further deployed in climate action, as coastal ecosystems are widely spread across the globe. Indeed, 151 countries around the world possess at least one of the three blue carbon ecosystems, and 71 countries contain all of them.[44] Yet, despite the significant carbon sequestration and storage capacity of coastal and marine ecosystems, as well as the range of benefits they provide to help people to adapt to a changing climate, these ecosystems are disappearing globally at a high rate, due to their vulnerability to the impacts of climate change and other anthropogenic pressures (e.g. pollution, ill-informed coastal development, artificialisation, overexploitation). When degraded or destroyed, blue carbon ecosystems emit the carbon they have stored for centuries, thereby turning into a source of GHG. To illustrate, the loss of even just 1% of remaining mangroves could lead to the loss of 0.23 gigatons of CO_2 equivalent - which equates to over 520 million barrels of oil.

This section looks at the 62 countries which have included coastal and marine NbS for mitigation purposes in their new or updated NDCs (Figure 6). Table 2 outlines the protection and restoration of (a) coastal blue carbon ecosystems and (b) other coastal ecosystems. It also points out the 8 countries (i.e. Chile, Costa Rica, Fiji, Kiribati, Liberia, Mauritius, Pakistan, United Arab Emirates) that included the protection and restoration of both ecosystem types. Table 2 further highlights frameworks and mechanisms related to the UNFCCC (i.e. the IPCC Wetlands Supplement or Land Use, Land-Use Change and Forestry (LULUCF) accounting[45]) that were included in new or updated NDCs, in relation to coastal and marine NbS, thereby giving additional substance to the commitments undertaken.

35/ IPCC (2019). Summary for Policymakers. In: Special Report on the Ocean and Cryosphere in a Changing Climate (H.-O. Pörtner, D.C. Roberts, V. MassonDelmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegr a, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. M. Weyer).

36/ ibid

37/ IPCC (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. In Press.

38/ The Blue Carbon Initiative (2023b). Mitigating Climate Change through Coastal Conservation.

39/ Leal, M., & Spalding, M., (2022). The State of the World's Mangroves 2022. Global Mangrove Alliance.

40/ The Nature Conservancy (2020a). The carbon sequestration power of coastal wetlands, Mapping Ocean Wealth.

41/ Solan, M., et al. (2020). Benthic-based contributions to climate change mitigation and adaptation. Phil. Trans. R. Soc. B 375.

42/ Chapter IV of the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (i.e. IPCC Wetlands Supplement) provides scientific knowledge and guidelines on the inclusion of coastal wetlands (namely seagrasses, salt marshes and mangroves) into national inventories and communications using a tiered approach allowing for flexibility around technical capacities.

43/ The Blue Carbon Initiative (2023a)

44/ ibid

45/ LULUCF is a GHG inventory sector for countries to quantify and account for the emissions and removals of GHGs from terrestrial lands.

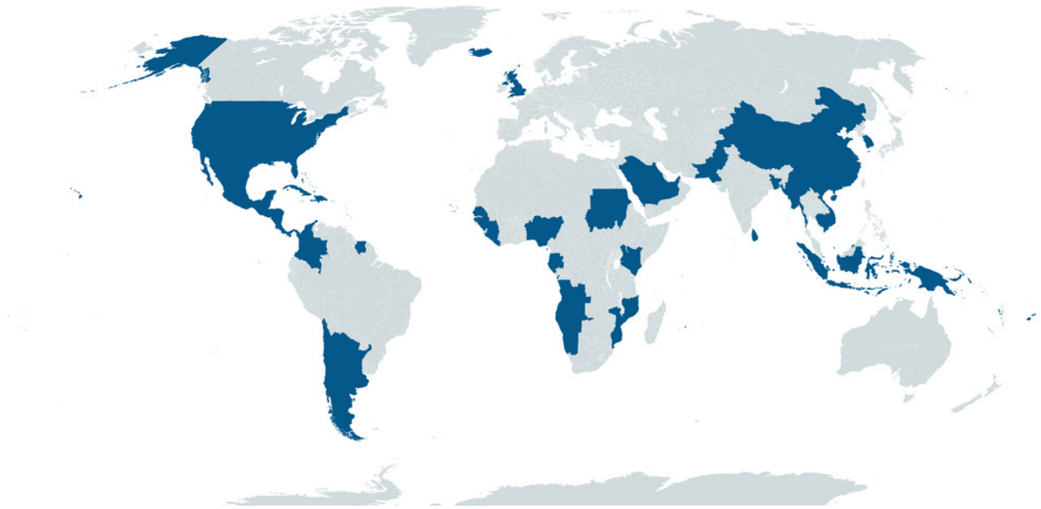


Fig. 6: Countries including coastal and marine NbS as mitigation components in their new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

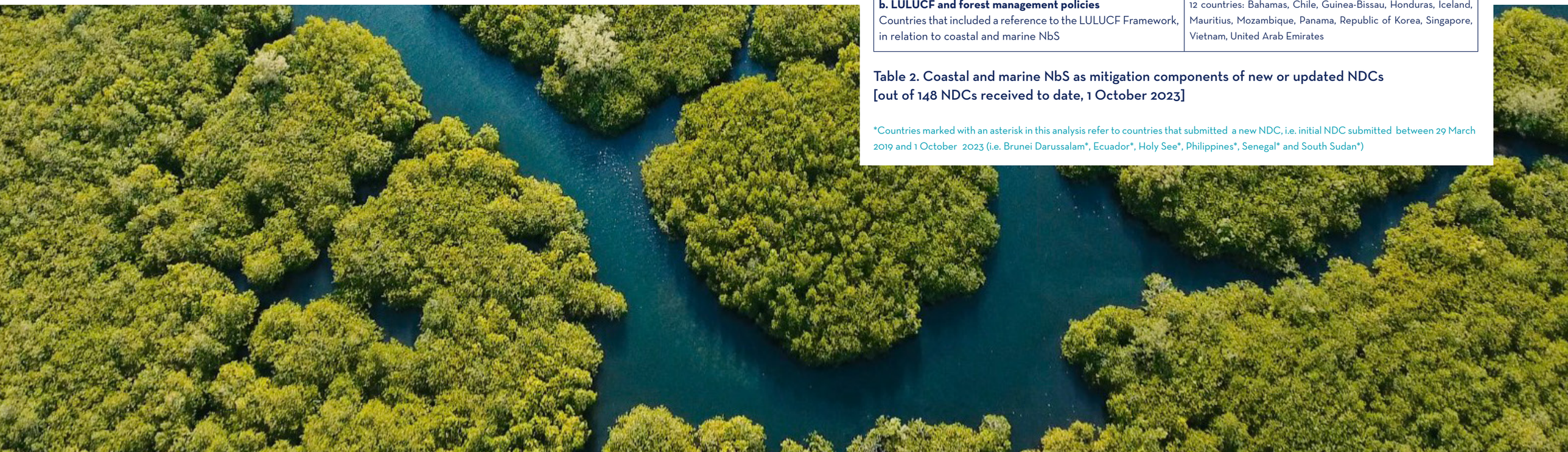
62 countries: Angola, Antigua and Barbuda, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, Indonesia, Kenya, Kiribati, Kuwait, Liberia, Maldives, Mauritius, Mexico, Mozambique, Myanmar, Namibia, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Timor-Leste, Tonga, Tuvalu, United Arab Emirates, United Kingdom, United States, Vanuatu, Viet Nam

Source: Ocean & Climate Platform via MapChart

Type	Countries (out of 148 submissions)
I. Protecting and restoring marine and coastal ecosystems Countries that included coastal and marine NbS as mitigation components of their new or updated NDCs (i.e., conservation and restoration of mangroves, seagrasses, salt marshes, and other coastal wetlands)	62 countries: Angola, Antigua and Barbuda, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, Indonesia, Kenya, Kiribati, Kuwait, Liberia, Maldives, Mauritius, Mexico, Mozambique, Myanmar, Namibia, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Timor-Leste, Tonga, Tuvalu, United Arab Emirates, United Kingdom, United States, Vanuatu, Viet Nam
a. Coastal blue carbon ecosystems Countries that included the conservation or restoration of mangroves, seagrasses, and/or saltmarshes as mitigation components of their new or updated NDCs	61 countries: Angola, Antigua and Barbuda, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, Indonesia, Kenya, Kiribati, Kuwait, Liberia, Maldives, Mauritius, Mexico, Mozambique, Myanmar, Namibia, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Timor-Leste, Tonga, Tuvalu, United Arab Emirates, United Kingdom, United States, Vanuatu, Viet Nam
b. Other marine and coastal ecosystems Countries that included the conservation or restoration of other coastal and marine ecosystems (e.g. kelp forests) as mitigation components of their new or updated NDCs	9 countries: Argentina, Chile, Costa Rica, Fiji, Kiribati, Liberia, Mauritius, Pakistan, United Arab Emirates
II. Frameworks and mechanisms Countries that explicitly referred to the IPCC Wetlands Supplement and/or to the LULUCF Framework in relation to coastal and marine NbS in their new or updated NDCs	21 countries: Australia, Bahamas, Barbados, Canada, Cape Verde, Chile, Fiji, Guinea-Bissau, Honduras, Iceland, Lebanon, Malaysia, Mauritius, Mozambique, Panama, Republic of Korea, Seychelles, Singapore, Vietnam, United Kingdom, United Arab Emirates
a. IPCC Wetlands Supplement Countries that included a reference to the IPCC 2013 Wetlands Supplement in relation to their coastal and marine NbS	14 countries: Australia, Barbados, Canada, Cape Verde, Fiji, Lebanon, Malaysia, Mauritius, Panama, Republic of Korea, Seychelles, Singapore, United Kingdom, United Arab Emirates
b. LULUCF and forest management policies Countries that included a reference to the LULUCF Framework, in relation to coastal and marine NbS	12 countries: Bahamas, Chile, Guinea-Bissau, Honduras, Iceland, Mauritius, Mozambique, Panama, Republic of Korea, Singapore, Vietnam, United Arab Emirates

Table 2. Coastal and marine NbS as mitigation components of new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

Countries marked with an asterisk in this analysis refer to countries that submitted a new NDC, i.e. initial NDC submitted between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*)



(a) Mitigation capacities of coastal blue carbon ecosystems

In total, 62 countries have included protection, conservation and restoration measures related to marine and coastal ecosystems (Table 2. I). Of these 62 countries, 61 new or updated NDCs mention mangroves, seagrasses and/or salt marshes for mitigation purposes (see Table 2. I. a). Examples include:

- ***Senegal**** integrated the restoration of 4000 hectares of mangrove areas on an annual basis. More generally, the country has recognized the role of mangrove forests in sequestering carbon emissions.

- ***Costa Rica*** recognised the mitigation potential of coastal and marine habitats like mangroves, and directly referred to them as "blue carbon ecosystems". It has committed to restoring 80% of mangrove forests located in the Gulf of Nicoya by 2030, and expressed its intention to ensure that protected and restored coastal wetlands are effectively managed and monitored.

- ***Kiribati*** committed to "mangrove forest preservation and enhancement [...] coastal vegetation, and seagrass beds" to "increase the carbon sink potential of ocean biodiversity".[46]

- ***China*** expressed its intention to "protect and restore the existing blue carbon ecosystems by means of various blue carbon pilot projects and marine ecological protection and restoration projects, giving full play to the role of blue carbon in mitigating climate change". It further explained that the "carbon sequestration capacity of mangroves, seagrass beds, salt marshes and others will be tapped".[47]

Chapter IV of the IPCC Wetlands Supplement provides scientific knowledge and guidelines on the inclusion of coastal wetlands, specifically seagrasses, salt marshes and mangroves, into national inventories and communications using a tiered approach allowing for flexibility around technical capacities.[48] 14 countries included a reference to the IPCC Wetlands Supplement in their new or updated NDCs - in line with their strategy to implement coastal and marine NbS for mitigation purposes. For instance:

- ***Mauritius*** committed to massive planting of trees, including mangroves, to significantly enhance its mitigation ambition. It "estimates GHG emissions and removals in the LULUCF sector"[49], including in relation to mangroves, and plans to incorporate the IPCC Wetlands Supplement.

- ***Canada*** integrated the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands in its updated NDC. Emissions and removals from wetlands were included, in line with Canada's measures to restore and protect nature.

Other coastal countries (e.g. Jamaica, New Zealand and Norway) included the IPCC 2013 Wetlands Supplement, without including any coastal or marine NbS, and were therefore not included in this report. However, these countries acknowledged that coastal and marine ecosystems are actionable and important to mitigation measures, and expressed their intention to integrate blue carbon ecosystems into their national GHG inventories - applying the IPCC guidance. This could lead to the upcoming identification and implementation of coastal and marine NbS for increased mitigation efforts.

- ***Jamaica*** stressed that all relevant GHG "were accounted for using the IPCC 2006 Guidelines for the National Greenhouse Gas Inventories and IPCC 2013 Wetlands Supplement".[50]

- ***New Zealand*** expressed its intention to give "future consideration to methodologies introduced by the 2013 IPCC Wetlands Supplement".[51]

46/ UNFCCC NDC Registry. Kiribati's updated NDC (p30)
47/ UNFCCC NDC Registry. China's updated NDC (p45)
48/ IPCC (2014a).
49/ UNFCCC NDC Registry. Mauritius' updated NDC (p7-8-16)
50/ UNFCCC NDC Registry. Jamaica's updated NDC (p2)
51/ UNFCCC NDC Registry. New Zealand's updated NDC (p12)

Many countries expressed an intention to reduce deforestation and forest degradation, and to enhance sustainable forest management in updated NDCs as part of a mitigation strategy.[52] Depending on a country's National Forest Definition, mangroves may be included in its overall forestry related activities, including Reducing Emissions from Deforestation and Forest Degradation (REDD+), and in its GHG inventory under LULUCF. While many countries address LULUCF and REDD+ activities in their new or updated NDCs, this report does not include an analysis of the supporting documentation that may provide a clearer indication if mangroves are included. This report only includes countries which specifically referred to mangroves in their forestry management policies. Additionally, a few countries, such as Papua New Guinea, are in the process of exploring how a national REDD+ programme can further maintain forest cover, including mangroves, therefore strengthening their coastal NbS mitigation components. Table 2 shows that 12 countries specifically referred to LULUCF activities in line with protecting coastal ecosystems for mitigation purposes, and more specifically with mangrove-related NbS.

- ***Papua New Guinea*** aims to include blue carbon ecosystems in its GHG inventory and UNFCCC reporting, with international technical and capacity building support. This support covers the identification of pathways to incorporate blue carbon by building upon existing Agriculture, Forestry and Other Land Use, REDD+ efforts, monitoring, reporting and verification capacity, and an enhanced consideration of mangroves and seagrasses in national climate policies.

- ***Vietnam*** committed to "implementing the target programme for sustainable forestry development for the 2016-2020 period; conserving and enhancing forest carbon stocks; protecting, restoring and planting mangrove and coastal protection forests aiming to exceed over 30% of the plan to 2020".[53] Vietnam thus contributes to preserving and sustaining such ecosystems in accordance with its forestry policies.

- ***Guinea-Bissau*** intends to focus on wetlands and mangroves: integrating forest conservation, ecosystem restoration and management of protected areas including through REDD+ programs.

(b) Mitigation capacities of other coastal and marine ecosystems

Beyond mangroves, salt marshes and seagrasses, other marine and coastal ecosystems (such as algae, soft bottom habitats and kelp forests) have potential mitigation benefits.[54] However, the measurable mitigation benefits of protecting these ecosystems still needs additional scientific evidence to be quantifiable and included in national GHG inventories.[55] It is interesting to note in that regard that peat is an exception, as it is already included in LULUCF inventories, as well as in some countries' REDD+ strategies, but generally considered forests and a terrestrial ecosystem - rather than coastal wetlands.[56] Table 2 I.b. identifies countries which include the protection and restoration of other coastal and marine ecosystems as mitigation components. Only 9 countries have integrated such ecosystems within their revised NDCs.

- ***Chile*** has announced that it will identify peatlands, as well as other categories of wetland under a national inventory framework by 2025, recognising and quantifying the mitigation value of such areas.

- ***Pakistan*** aims to conserve and restore "mangroves, peatland ecosystems, and coastal and marine ecosystems to reduce emissions and revive natural carbon sink".[57]

52/ UNFCCC (2021)
53/ UNFCCC NDC Registry. Vietnam's updated NDC (p19)
54/ Taillardat, P., et al. (2020). Climate change mitigation potential of wetlands and the cost-effectiveness of their restoration. Interface Focus.
55/ In that regard, the IPCC could develop a supplement to its 2006 guidelines for national inventories of anthropogenic emissions by sources and removals by sinks for other blue carbon ecosystems beyond those covered under the IPCC Wetlands Supplement. The guidelines should include blue carbon ecosystems. This would promote the inclusion of such ecosystems into NDCs and NAPs, as well as ensure consistency and comparability among the information provided through the Enhanced Transparency Framework. For more information, please see: Diz, D., et al. (2021).
56/ Thomson, A., et al. (2020). Updated quantification of the impact of future land use scenarios to 2050 and beyond- Final report. UK Centre for Ecology and Hydrology p1-76.
57/ UNFCCC NDC Registry. Pakistan's updated NDC (p36)

COASTAL AND MARINE NATURE-BASED SOLUTIONS IN ADAPTATION EFFORTS

NDCs shall embody national efforts to reduce GHG emissions, but Parties to the Convention decided at UNFCCC COP 20 (2014) that Parties should "consider communicating their undertakings in adaptation planning or consider including an adaptation component"[58] in NDCs. Article 7.11 of the Paris Agreement establishes that adaptation communications can be submitted as a component of or in conjunction with other communications or documents, including an NDC.[59] While the inclusion of adaptation measures remains optional, most countries have used their NDC to highlight adaptation objectives and resulting funding needs alongside mitigation components. Adaptation measures are crucial to protect goods, people and ecosystems from increasing climate risks and vulnerability.[60]

Coastal regions and island states already face the destruction of coastal and marine ecosystems, as well as the degradation of the vital services they provide.[61, 62] The IPCC SROCC indicated that, in a business-as-usual scenario, global sea level could rise by up to a meter by 2100.[63] Extreme events linked to sea level rise, which previously happened once in a century, could now occur much more frequently. For instance, extreme El Niño events are projected to occur about twice as often under a low-emission scenario (i.e. RCP2.6) in the 21st century when compared to the 20th century.[64] Meanwhile, populations living on the coasts, which are increasingly vulnerable, continue to densify. More than 70% of the urban population is expected to be living in coastal cities by 2025.[65]

In this context, coastal and marine NbS for adaptation have the potential to protect vulnerable coastal communities and ecosystems from the impacts of climate change (e.g. extreme weather events, coastal erosion, sea-level rise), increasing their resilience and providing key ecosystem services to local populations. For example, coral reefs significantly reduce wave heights during coastal storms and tsunamis by reducing wave energy by an average of 97%, while providing a range of adaptation measures and helping communities to better cope with climate disasters.[66] This is among the reasons why several countries, such as Papua New Guinea and the Maldives, have included coral reefs in their NDCs.

This section focuses on the 96 countries that have included coastal and marine NbS for adaptation in their new or updated NDC, as illustrated in Figure 7. Table 3 outlines three types of solutions for adaptation: protecting and restoring coastal and marine ecosystems (I.a.); coastal zone management and protected areas (I.b.); and climate-ready fisheries and fishing communities (I.c.). Overall, 44 countries[67] included all three solutions types in their new or updated NDC, 37[68] included two and 15[69] only included one. Moreover, it is worth noting that, out of the 148 countries having submitted their NDCs, 93 recognised the pressures weighing on the ocean and/or the threats coming from ocean changes induced by climate impacts. Among them, 6 did not include any coastal and marine NbS for adaptation in their updated NDC (i.e. Georgia, Grenada, Jamaica, Monaco, Oman, State of Palestine), as highlighted in Table 3. II.

58/ UNFCCC (2015). Report of the Conference of the Parties on its twentieth session, held in Lima from 1 to 14 December 2014.

59/ Article 7.11 of the Paris Agreement: "The adaptation communication referred to in paragraph 10 of this Article shall be, as appropriate, submitted and updated periodically, as a component of or in conjunction with other communications or documents, including a national adaptation plan, a nationally determined contribution as referred to in Article 4, paragraph 2, and/or a national communication"

60/ OCEAN AND CLIMATE (2019b). Policy Recommendations: A healthy ocean, a protected climate.

61/ Nichols, C., et al. (2019). Degradation of Coastal Ecosystems: Causes, Impacts and Mitigation Efforts.

62/ IPCC (2021)

63/ IPCC (2019)

64/ *ibid*

65/ United Nations Human Settlements Programme (2011). Global report on human settlement. Cities and Climate Change. Table 1.2.

66/ Ferrario, F., et al. (2014). The effectiveness of coral reefs for coastal hazard risk reduction and adaptation. Nature communications.

67/ Albania, Antigua and Barbuda, Argentina, Bahamas, Bangladesh, Belize, Benin, Cambodia, Cameroon, Cape Verde, Congo, Costa Rica, Cuba, Dominica, El Savador, Fiji, Gabon, Gambia, Guatemala, Haiti, Kenya, Lebanon, Liberia, Malaysia, Maldives, Mauritius, Micronesia, Mozambique, Myanmar, Nauru, Panama, Senegal*, Seychelles, Sierra Leone, Somalia, Sri Lanka, Sudan, Timor-Leste, Togo, Tunisia, United Arab Emirates, United Kingdom, Vanuatu, Vietnam

68/ Angola, Bahrain, Barbados, Brunei Darussalam*, Chile, China, Colombia, Comoros, Côte d'Ivoire, Dominican Republic, Democratic Republic of Congo (DRC), Egypt, Equatorial Guinea, Guinea, Guinea Bissau, Indonesia, Kiribati, Kuwait, Marshall Islands, Mauritania, Mexico, Morocco, Namibia, Pakistan, Papua New Guinea, Republic of Korea, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Singapore, Suriname, Tonga, Tuvalu, United Republic of Tanzania, Uruguay, Venezuela

69/ Australia, Canada, Ecuador*, Honduras, Iceland, India, Jordan, Nigeria, Peru, Philippines*, Qatar, Saint Kitts and Nevis, Solomon Islands, South Africa, United States

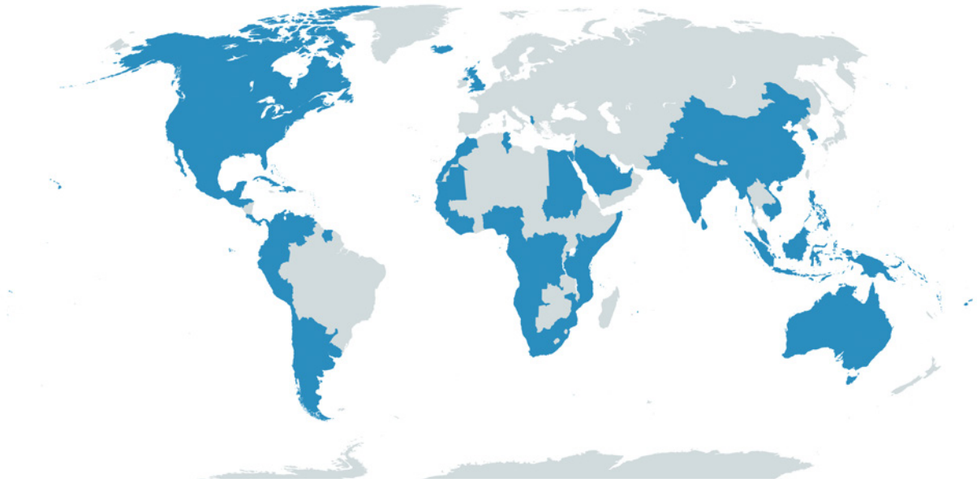


Fig. 7: Countries including coastal and marine NbS as adaptation components in their new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

96 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cameroon, Canada, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominica, Dominican Republic, Democratic Republic of Congo (DRC), Ecuador*, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, India, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Pakistan, Panama, Papua New Guinea, Peru, Philippines*, Qatar, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Uruguay, Vanuatu, Venezuela, Vietnam

Source: Ocean & Climate Platform via MapChart

Type	Countries (out of 148 submissions)
I. Nature-based solutions for adaptation Countries that included coastal and marine NbS as adaptation components of their new or updated NDCs (i.e. protecting and restoring coastal and marine ecosystems, coastal zone management and protected areas, and climate-ready fisheries)	96 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cameroon, Canada, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominica, Dominican Republic, Democratic Republic of Congo (DRC), Ecuador*, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, India, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Pakistan, Panama, Papua New Guinea, Peru, Philippines*, Qatar, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Uruguay, Vanuatu, Venezuela, Vietnam
a. Protecting and restoring coastal and marine ecosystems Countries that included the protection, restoration and/or sustainable management of coastal wetlands as adaptation components of their new or updated NDCs	71 countries: Albania, Antigua and Barbuda, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cameroon, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Iceland, Indonesia, Kenya, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Mozambique, Myanmar, Namibia, Nauru, Pakistan, Panama, Papua New Guinea, Philippines*, Qatar, Saint Lucia, Samoa, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Somalia, Sri Lanka, Sudan, Suriname, Togo, Tunisia, United Arab Emirates, United Kingdom, Uruguay, Vanuatu, Venezuela, Vietnam
b. Coastal zone management and marine protected areas Countries that included coastal zone management, marine spatial planning (MSP), marine protected areas (MPA) and/or other effective area-based conservation measures (OECM) as adaptation components of their new or updated NDCs	91 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Brunei Darussalam*, Cambodia, Cameroon, Canada, Cape Verde, Chile, China, Colombia, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominica, Dominican Republic, DRC, Ecuador*, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, India, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States, Uruguay, Vanuatu, Venezuela, Vietnam
c. Climate-ready fisheries and fishing communities Countries that included climate-ready management of fisheries and aquaculture, and/or small-scale, artisanal or local fisheries as adaptation components of their new or updated NDCs	59 countries: Albania, Angola, Antigua and Barbuda, Argentina, Bahamas, Bangladesh, Belize, Benin, Cambodia, Cameroon, Cape Verde, Chile, Comoros, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominica, DRC, Egypt, El Salvador, Fiji, Gabon, Gambia, Guatemala, Haiti, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Mauritius, Micronesia, Morocco, Mozambique, Myanmar, Nauru, Panama, Peru, Republic of Korea, Sao Tome and Principe, Senegal*, Seychelles, Sierra Leone, Somalia, Sri Lanka, Sudan, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United Republic of Tanzania, Vanuatu, Vietnam
II. Acknowledging vulnerabilities without committing to the implementation of related NbS Countries that referred to the vulnerabilities facing coastal and marine ecosystems, as well as coastal communities, without including coastal and marine NbS for adaptation in their new or updated NDCs	6 countries: Georgia, Grenada, Jamaica, Monaco, Oman, State of Palestine

Countries marked with an asterisk in this analysis refer to countries that submitted a new NDC, i.e. initial NDC submitted between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*)

Table 3. Coastal and marine NbS as adaptation components of new or updated NDCs [out of 148 NDCs received to date, 1 October 2023]

(a) Protecting and restoring coastal and marine ecosystems

Many Parties included the protection and restoration of coastal and marine ecosystems as part of their adaptation strategy in their new or updated NDC, since 71 countries included coastal wetlands as adaptation measures in their NDC (Table 3. I. a.).

- ***Argentina*** recognised the importance of ecosystem-based management, and promoted its use to protect and restore coastal and marine ecosystems such as marshes and peatlands. It also aims to adopt an ecosystem approach to ensure the conservation and sustainable use of marine biodiversity, and strengthen applied research on adaptive management and protection of ecosystems.

- ***Colombia*** developed ecosystem-based plans for adaptation to conserve, protect and restore mangroves, seagrasses and other coastal ecosystems. It chose to focus on "strategic ecosystems", namely mangroves, wetlands, coral reefs and ocean to adapt to the effects of climate change.

- ***The Dominican Republic*** committed to protect and restore coastal and marine ecosystems, including mangroves, corals and dunes, to reduce vulnerability and increase resilience in the face of climate change. It involves, for example, managing a fund for ecosystem restoration.

- ***Micronesia*** aims to increase the resilience of coral reefs, mangrove forests, and wetlands to climate change impacts, and adopt an ecosystem-based approach to adaptation projects. The Micronesian NDC, notes that natural defense systems such as coastal vegetation will, for instance, improve flood resilience.

(b) Coastal zone management and protected areas

The competition for ocean space and resources requires the effective and coherent management of Parties' Exclusive Economic Zones (EEZ), and related activities, to ensure the sustainable and compatible use of such space and resources.[70] Coastal zone management and marine spatial planning (MSP) can be effective area-based management tools to sustainably manage coastal and marine ecosystems, in the context of a changing climate, while maintaining economic activities that are respectful to the environment. To date, 91 countries have included coastal zone management and MSP measures in their new or updated NDCs (Table 3. I.b.). Among them, 11 countries mentioned the Sendai Framework for Disaster Risk Reduction directly in relation to their coastal management and MSP policies.[71] It is worth noting that a larger number of countries included measures to manage coastal zones (I.b), compared with measures to protect and restore coastal and marine ecosystems (I.a) and enhance climate-ready fisheries and fishing communities (I.c).

- ***Kenya*** aims to develop MSP to boost sustainable management approaches. Local communities will be further involved in the process, thereby strengthening the governance of community structures in participatory resource management of coastal ecosystems. ***Kenya*** also recalled the need to integrate the use of NbS into local and national development plans.

- ***Vietnam*** plans to reduce disaster risks and minimise damage by increasing preparedness to respond to climate-induced hazards. To that end, it will develop community-based and ecosystem-based adaptation strategies and measures (e.g. to cope with saltwater intrusion). Vietnam's NDC also states that it will prevent erosion for coastal areas, and develop a system of coastal protection (e.g. bamboo forests).

- ***The Bahamas*** committed to improve management and conservation of ecosystems, including by protecting and restoring damaged and degraded ecosystems such as mangroves and coral reefs.

Coastal management measures and tools also include MPAs (i.e. promote biodiversity conservation as their primary objective), as well as Other Effective area-based Conservation Measures (OECMs) (i.e. deliver effective biodiversity conservation regardless of whether that is the goal - such as sacred natural sites). In these managed areas, uses and activities can be even further limited and regulated to protect ecosystems. A restricted number of activities (e.g., small-scale fishing practices and ecotourism) may be authorised to enhance local livelihoods and sustainable development of coastal communities, while enabling healthy ecosystems for coastal resilience. MPAs are increasingly being advocated as ocean-based climate solutions. When effectively-managed and properly sited, they can help mitigate and adapt to climate change while providing conservation benefits.[72][73] So far, 47 countries have included MPAs or OECMs in their new or updated NDCs[74] and, of these, all but Australia, Canada, and Pakistan have also committed to coastal zone management and MSP measures. The opposite is not necessarily true, since some countries have an MSP strategy but have not designated MPAs or OECMs.

- ***Chile*** indicates that all MPAs created up to 2020 will develop a management or administration plan that considers climate adaptation components. ***Chile*** plans on deploying new MPAs in underrepresented marine ecoregions, which will be identified taking into consideration criteria related to the effects of climate change, among others. ***Chile*** aims to create a representative network of MPAs, that will include coastal wetlands.

- ***Albania*** aims to "strengthen the system of protected areas, including coastal and marine ecosystems, for effective conservation and sustainable use". It will therefore implement new MPAs "along the wetland and lagoon areas to support integrated efforts into developing adaptation measures".[75]

- ***Jordan*** expressed its intention to enhance the sustainable use of MPAs for climate change adaptation - including in the Aqaba marine reserve. It called for strengthened management structures and objectives of MPAs to improve resilience to climate change as an integral component of its management plans.

70/ Jouffray, J.-B., et al. (2020). The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. One Earth. Volume 2, Issue 1, 24 January 2020, Pages 43-54.

71/ Argentina, Cape Verde, Colombia, Costa Rica, Dominican Republic, Guatemala, Indonesia, Mauritius, Philippines*, United Republic of Tanzania, Uruguay

72/ Jacquemont, J., et al. (2022). Ocean conservation boosts climate change mitigation and adaptation. One Earth. Volume 5. Issue 10. P1126-1138. October 21, 2022.

73/ Thiele, T., & Epps, M., (2022). Saving the ocean and climate through innovative marine protected area finance mechanisms, Gland, Switzerland, IUCN Headquarters: IUCN. 8 pages.

74/ Albania, Argentina, Australia, Bahamas, Barbados, Belize, Canada, Cape Verde, Chile, Colombia, Congo, Costa Rica, Egypt, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea Bissau, Haiti, Honduras, Indonesia, Jordan, Lebanon, Liberia, Malaysia, Mauritius, Mexico, Micronesia, Morocco, Myanmar, Namibia, Pakistan, Panama, Papua New Guinea, Senegal*, Seychelles, Sierra Leone, Solomon Islands, Sri Lanka, Suriname, Timor-Leste, Tonga, United Arab Emirates, United Kingdom, Uruguay, Vanuatu, Venezuela

75/ UNFCCC NDC Registry. Albania's updated NDC (p77)

(c) Climate-ready fisheries and fishing communities

Climate-ready fisheries and aquaculture aim to reduce the vulnerability and increase the resilience of the aquatic food sector to the impacts of climate change.[76] Such practices include institutional adaptation (e.g. public policies, legal frameworks, management and planning), livelihoods adaptation, risk reduction and management for resilience (e.g. early warning, preparedness and responses). Climate-ready approaches in fisheries and aquaculture are very much connected to major cross-cutting global issues (e.g. food security, poverty reduction, decent work), and play a key role in sustainable development, as millions of people rely on productive fisheries as a source of protein and livelihoods.[77][78] Further, many of the activities listed in the above sections for coastal protection and restoration of coastal wetlands, including blue carbon ecosystems, are also vital for climate-ready fisheries as those ecosystems provide critical fish habitat. For instance, projects of mangroves restoration can, in some cases, lead to an increase in aquaculture productivity.[79]

Only 59 countries included sustainable management of fisheries (including small-scale, artisanal and local fisheries) in their new or updated NDCs as a climate adaptation strategy (Table 3.I.c). In addition, some of these countries also committed to increase their aquaculture and seaweed farming capacities, thereby potentially providing other benefits (e.g. food security, livelihoods, climate mitigation). It is interesting to note that climate-ready fisheries management is the least used of all three types of coastal and marine NbS for adaptation identified in this report.

- ***The Maldives*** aims to diversify the fishery sector to better respond to emerging climate-induced challenges and uncertainties (e.g., extreme events). The Maldives aims to strengthen insurance schemes to enhance resilience of small-scale fisheries to cover against losses due to extreme events and anomalies. Both measures will support local fishermen and secure their livelihoods.

- ***Cambodia*** promotes the sustainable use of fisheries resources, and highlights the need to increase the adaptation and resilience of this sector. For instance, Cambodia plans to reduce pressures on fishing resources, and to develop aquatic habitats, as well as climate-smart aquaculture production systems and practices. To achieve these objectives, Cambodia aims to involve the private sector, especially in capacity development, input supplies, technologies and marketing.

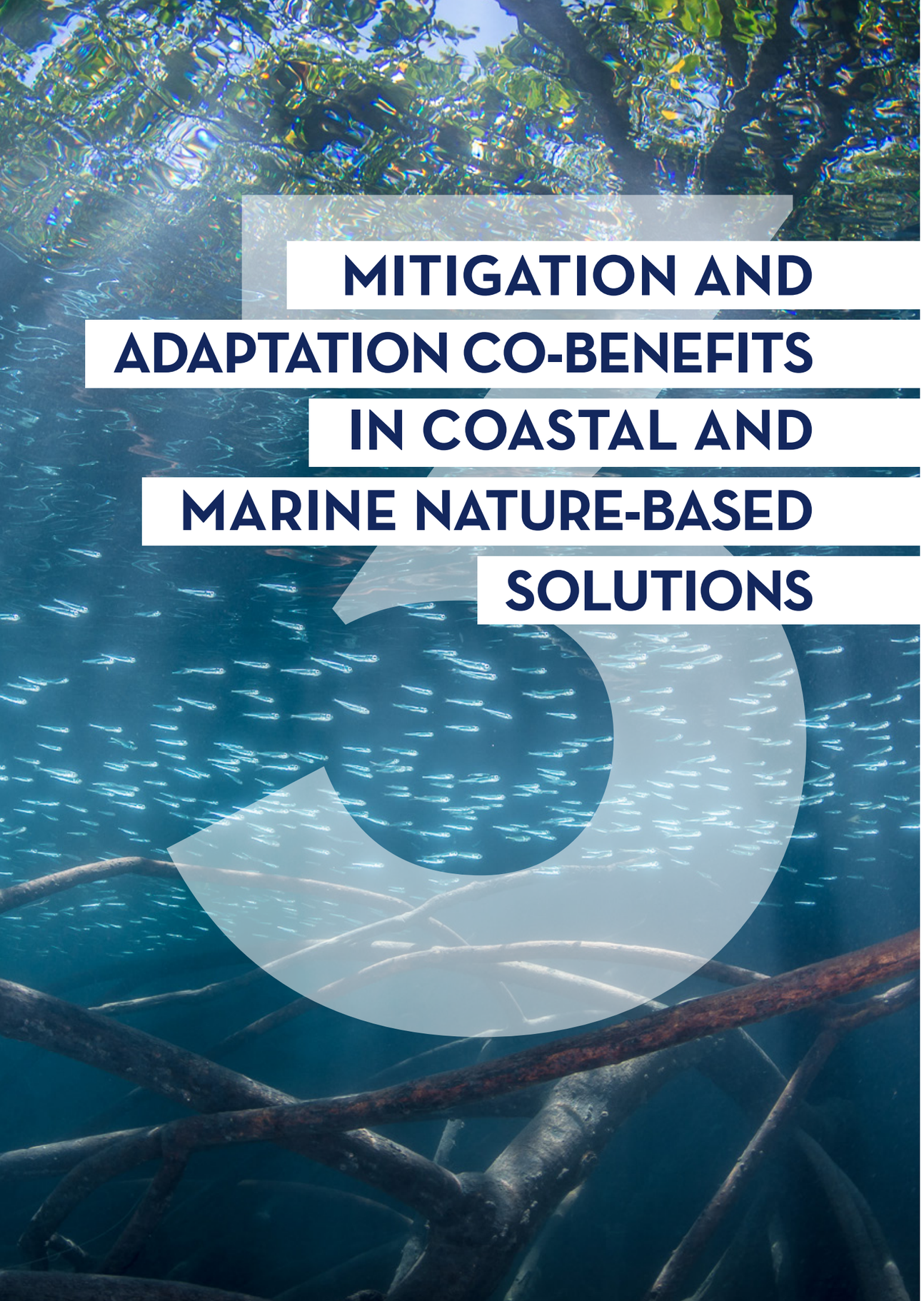
- The coastal and marine resources strategy of ***Dominica*** is articulated around four pillars: (1) Sustainable development and diversification strategy; (2) Sustainable Fishing Communities and Livelihoods Strategy; (3) Sustainable Resource Management Strategy; and (4) Governance and Institutional Development Strategy. The strategy considers, among others, climate change adaptation and food security.

76/ FAO (2021). Adaptive management of fisheries in response to climate change. FAO Fisheries and Aquaculture Technical Paper No.667.

77/ FAO (2022). The State of World Fisheries and Aquaculture.

78/ Jouffray, J.B., et al. (2021)

79/ Bosma, R.H., et al. (2020). Associated Mangrove Aquaculture Farms; Building with Nature to restore eroding tropical muddy coasts. Ecoshape technical report, Dordrecht, The Netherlands.



MITIGATION AND ADAPTATION CO-BENEFITS IN COASTAL AND MARINE NATURE-BASED SOLUTIONS

The notion of co-benefits implies a win-win situation, addressing multiple goals with a single policy measure, to maximise synergies and reduce trade-offs between socioeconomic and environmental issues. The IPCC defines co-benefits as "the positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare."[80] Co-benefits are intrinsic to NbS, which aim to address societal challenges and provide human well-being and biodiversity benefits.

Given the cross-cutting nature of coastal and marine NbS, mitigation and adaptation measures can be implemented in an integrated approach. NbS have the potential to create positive and cost-effective outcomes[81,82] for both people and nature (i.e. relatively low-cost considering high benefits). For example, they can provide mitigation co-benefits from adaptation measures (e.g. protecting coastal and marine ecosystems to support a sustainable and productive small-scale fisheries sector – as an adaptation approach – while also enhancing the natural carbon sinks and reservoirs), as well as adaptation co-benefits from mitigation measures (e.g. protecting and accounting for the carbon storage in blue carbon ecosystems – as a mitigation approach – while also protecting coastal communities using natural infrastructures[83]). Mitigation co-benefits also have an additional reporting expectation in the Enhanced Transparency Framework, akin to the mitigation reporting requirements for the NDC's mitigation section.[84]

The present section focuses on the 55 countries that mentioned the mitigation and/or adaptation co-benefits of the coastal and marine NbS included in their new or updated NDC - as illustrated in Table 4. From this analysis, 17 countries have mentioned both mitigation and adaptation co-benefits of coastal and marine NbS in their new or updated NDCs (Table 4. I.).

- ***Cape Verde*** indicated that its "mitigation and adaptation commitments do not stand in isolation from each other and that they transcend the boundaries of climate change policymaking."[85] More specifically, ***Cape Verde*** notes that its "mitigation commitments directly yield a range of significant adaptation and resilience benefits", and that "many adaptation measures directly yield mitigation co-benefits." It further states that the national "coastal wetlands are important carbon stocks", as they "also maintain and improve the country's carbon sink capabilities".

- ***Bangladesh*** noted that mitigation and adaptation often coexist, and acknowledged mitigation co-benefits of their adaptation actions (i.e. coastal and marine protection and restoration, and coastal zones management). It also indicated that its NAP "will identify the co-benefits so that the synergy between adaptation and mitigation can be fully achieved".[86]

→

80/ IPCC (2014b). Fifth Assessment Report (AR5). p14.

81/ Narayan, S., et al. (2016). The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-Based Defences.

82/ Seddon, N., et al. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. Phil. Trans. R. Soc. B 375

83/ Thiele, T., et al. (2020). Blue Infrastructure Finance: A new approach. integrating Nature-based Solutions for coastal resilience.

84/ UNDP (2017). A guide to transparency under the UNFCCC and the Paris Agreement. Reporting and review: obligations and opportunities.

85/ UNFCCC NDC Registry. Cape Verde's updated NDC (p17)

86/ UNFCCC NDC Registry. Bangladesh's updated NDC (p19)

Type	Countries (out of 148 submissions)
I. Recognition of mitigation and/or adaptation co-benefits Countries that mentioned co-benefits of their mitigation and/or adaptation measures in relation to their coastal and marine NbS in their new or updated NDCs	55 countries: Albania, Argentina, Australia, Bahrain, Bangladesh, Belize, Benin, Cambodia, Cape Verde, Chile, Colombia, Congo, Costa Rica, Côte d'Ivoire, Cuba, Dominican Republic, El Salvador, Fiji, Gambia, Guatemala, Guinea, Guinea Bissau, Indonesia, Kenya, Liberia, Lebanon, Maldives, Mauritius, Mexico, Micronesia, Mozambique, Myanmar, Namibia, Nauru, Pakistan, Panama, Papua New Guinea, Philippines*, Qatar, Saint Lucia, Samoa, Saudi Arabia, Seychelles, Sierra Leone, Singapore, Sri Lanka, Sudan, Suriname, Timor-Leste, Tonga, United Arab Emirates, United Kingdom, Uruguay, Vanuatu, Vietnam
a. Recognition of both mitigation and adaptation co-benefits Countries that mentioned co-benefits of both their mitigation and adaptation measures in relation to their coastal and marine NbS	17 countries: Argentina, Belize, Cambodia, Cape Verde, Chile, Colombia, Cuba, Fiji, Liberia, Namibia, Nauru, Panama, Papua New Guinea, Saint Lucia, Sri Lanka, Vietnam, United Arab Emirates
b. Recognition of mitigation co-benefits only Countries that mentioned only mitigation co-benefits of their adaptation measures in relation to their coastal and marine NbS (e.g. enhancing carbon sinks and reservoirs)	31 countries: Albania, Australia, Bahrain, Bangladesh, Congo, Costa Rica, Côte d'Ivoire, El Salvador, Gambia, Guatemala, Guinea Bissau, Indonesia, Kenya, Lebanon, Mauritius, Mexico, Micronesia, Mozambique, Myanmar, Pakistan, Philippines*, Qatar, Samoa, Saudi Arabia, Seychelles, Sierra Leone, Sudan, Suriname, United Kingdom, Uruguay, Vanuatu
c. Recognition of adaptation co-benefits only Countries that mentioned only adaptation co-benefits of their mitigation measures in relation to their coastal and marine NbS (i.e. countries that include one or several co-benefits related to coastal and marine ecosystem-based mitigation strategies)	7 countries: Benin, Dominican Republic, Guinea, Maldives, Singapore, Timor-Leste, Tonga
II. Recognition of other socioeconomic benefits to local populations Countries that mentioned socio-economic benefits to local populations resulting from mitigation and adaptation measures of coastal and marine NbS in their new or updated NDCs (e.g. economic opportunities, food and water security)	44 countries: Albania, Argentina, Bahrain, Bangladesh, Belize, Benin, Cambodia, Cape Verde, Chile, Congo, Côte d'Ivoire, Cuba, Dominica, Fiji, Gabon, Guatemala, Indonesia, Kenya, Lebanon, Maldives, Mauritius, Mexico, Micronesia, Mozambique, Myanmar, Namibia, Pakistan, Panama, Papua New Guinea, Saint Kitts and Nevis, Samoa, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Somalia, Sri Lanka, Sudan, Suriname, Timor-Leste, United Arab Emirates, United Republic of Tanzania, Vietnam

Countries marked with an asterisk in this analysis refer to countries that submitted a new NDC, i.e. initial NDC submitted between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*)

Table 4. Co-benefits in coastal and marine NbS as part of new or updated NDCs
[out of 148 NDCs received to date, 1 October 2023]

(a) Mitigation co-benefits of adaptation measures: Enhancing carbon sinks and reservoirs

Adopting an Ecosystem-based Adaptation (EbA) approach can generate key mitigation co-benefits[87] (i.e. enhancing carbon sink and reservoir capabilities). Out of the 55 countries that mentioned co-benefits, 48 explicitly recognised mitigation co-benefits from adaptation measures in coastal and marine NbS. Boosting carbon sink and reservoir capabilities was the main co-benefit mentioned by Parties in new or updated contributions. Notable observations include:

- ***Saint Lucia*** expressed its intention to solve the "die-back of the largest mangrove" in its national territory to "strengthen the country's climate resilience"[88], specifying that this policy measure has expected mitigation co-benefits from such coastal wetlands.

- ***Fiji*** committed to work towards enhancing the ocean as a carbon sink. To that end, ***Fiji*** will be allocating 30% of its EEZ as MPA and work towards 100% management of its EEZ by 2030 - thereby complementing its NAP. It considered mitigation co-benefits, conserving ocean reservoirs as carbon sinks through supporting coastal ecosystems protection.

- ***Mauritius*** recognised the mitigation co-benefits of its measures to adapt the fisheries sector to the impacts of climate change. It stated that the development of climate-smart fishery and aquaculture based on sustainable and integrated management plans will contribute to the mitigation of GHG emissions during the fishing and production stages and throughout the entire value chain.

(b) Adaptation co-benefits of mitigation measures: Protecting coastal communities and infrastructure

Enhancement of coastal and marine carbon sinks also has critical adaptation co-benefits such as reducing storm surges and coastal flooding from sea level rise, and providing defense against salination resulting from sea water intrusion. Healthy and intact marine and coastal ecosystems represent effective natural buffers against climate change impacts. It is estimated that mangroves reduce risk to more than 15 million people across 59 countries, and prevent more than USD$ 65 billion in property damages every year, by blocking storm surges and dampening waves.[89] In many places, protecting mangrove forests can therefore be an "extremely economically effective strategy for protecting coasts from tropical storm damages".[90]

As outlined in Table 4, 24 countries acknowledged adaptation co-benefits from mitigation measures (i.e. the protection of coastal communities and infrastructure) in coastal and marine NbS (see I.b.).

- ***Papua New Guinea***'s updated NDC included some mangrove and seagrass planting and management measures, as well as coral reef rehabilitation plans, in order to benefit from other services that these natural habitats provide to communities and ecosystems. In particular, these actions will support ***Papua New Guinea***'s effort in addressing the issue of coral degradation, coastal flooding and sea level rise. Concretely, ***Papua New Guinea*** will establish MPAs, including Locally Managed Marine Areas (LMMA).

87/ Scarano, F., (2017). Ecosystem-based adaptation to climate change: concept, scalability and a role for conservation science. Perspectives in Ecology and Conservation, Volume 15, Issue 2. Pages 65-73.

88/ UNFCCC NDC Registry. Saint Lucia's updated NDC (p15)

89/ Beck, M., & Menendez, P., (2020). Protecting mangroves can prevent billions of dollars in global flooding damage every year.

90/ ibid

- ***Namibia*** highlighted the "unique role [of blue carbon ecosystems] in protecting coastlines from the increasing impacts of climate change by absorbing incoming wave energy, providing storm surge protection and preventing erosion".[91]

- In relation to its strategy to manage water and minimise floods, ***Singapore*** stated that the country will conserve and restore its mangrove forest, as "mangroves help to dissipate waves and trap sediment, potentially serving as a flexible form of coastal defense while reducing erosion."[92]

(c) Providing other socioeconomic benefits to local populations

Co-benefits from coastal and marine NbS are multiple and diverse, including cultural, aesthetic and socioeconomic values[93], and are therefore not restricted to mitigation and adaptation advantages. Coastal and marine NbS provide a wide range of other socioeconomic benefits - although quantifying the positive externalities generated can be challenging.[94] NbS can be highly beneficial to local biodiversity and ecosystems by enhancing fisheries productivity, improving water quality, and acting as nurseries for species. They are also profitable and welfare-enhancing for humans, as coastal and marine NbS support livelihoods, health, well-being, food systems, and the creation of jobs among others. As a result, coastal and marine NbS can greatly contribute to achieving Sustainable Development Goals (SDGs), especially SDG 1 – *No Poverty*, SDG 2 – *Zero Hunger*, SDG 3 – *Good Health*, SDG 6 – *Clean Water*, SDG 8 – *Decent Work*, SDG 13 – *Climate Action*, and of course SDG 14 – *Life below Water*.

As outlined in Table 4, 44 new or updated NDCs refer to co-benefits related to other socioeconomic benefits provided to local populations (Section II). Notable observations from this include:

- ***Cuba***'s updated NDC has integrated some preservation measures for mangroves and coral reefs, in order to maintain their role in enhancing soil and water quality, and the protection of beaches for recreational purposes, such as tourism.

- ***Pakistan*** highlighted socio-economic benefits resulting from its mitigation efforts, in relation to its REDD+ programme. It stated that "protecting critical mangrove forests in Sindh and Balochistan, and raising new plantations of mangroves over an area of 16,552 ha" will have benefits "for climate mitigation, biodiversity conservation, and strengthening local livelihoods of fisheries and eco-tourism". ***Pakistan*** also highlighted opportunities of "non-market-based approaches like Blue bonds".[95]

- ***Sudan*** aims to build the resilience of dependent local communities as a result of mangroves restoration and management. It specifically highlighted marine subsistence and alternative livelihoods.

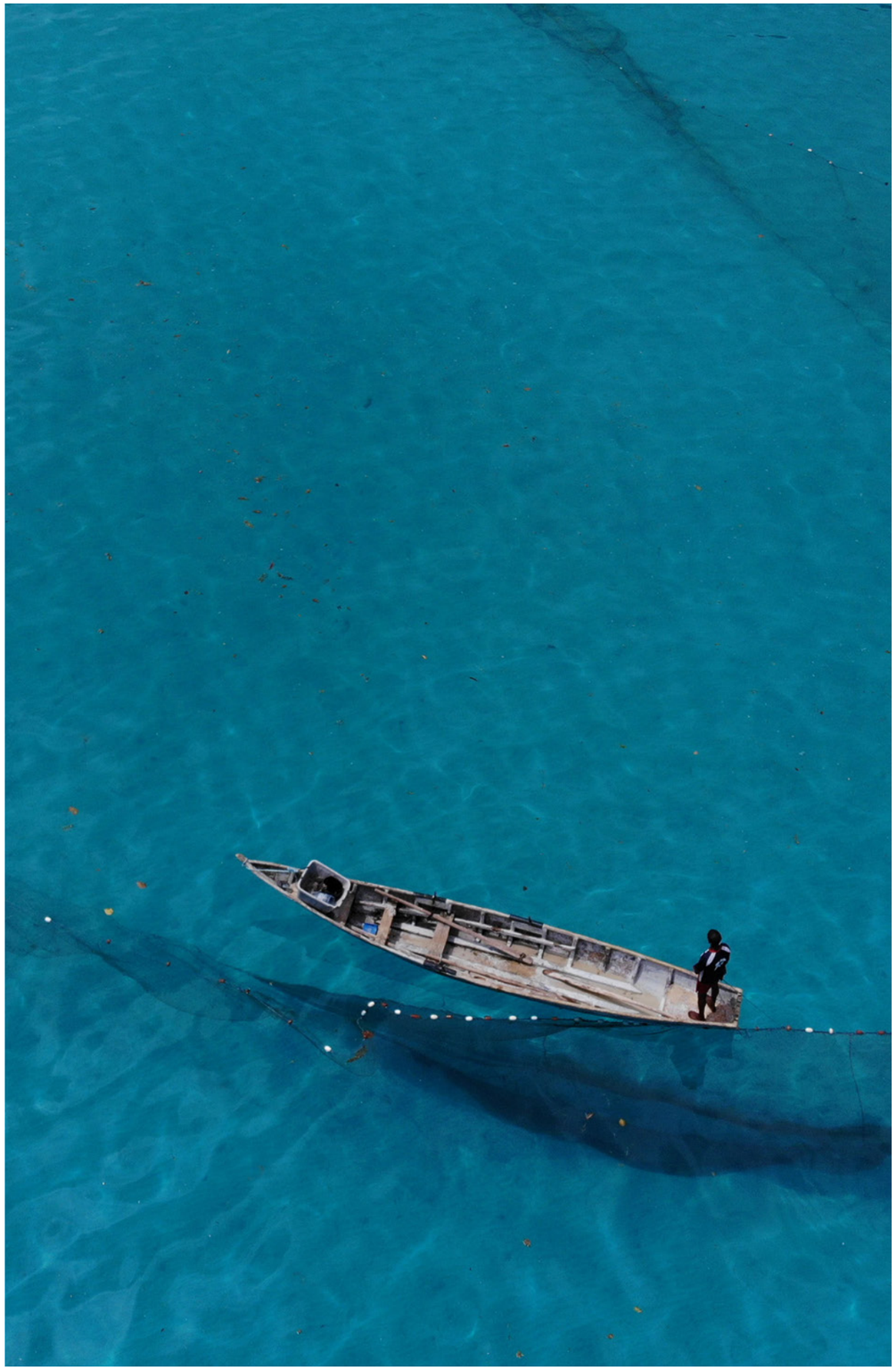
91/ UNFCCC NDC Registry. Namibia's updated NDC (p38)

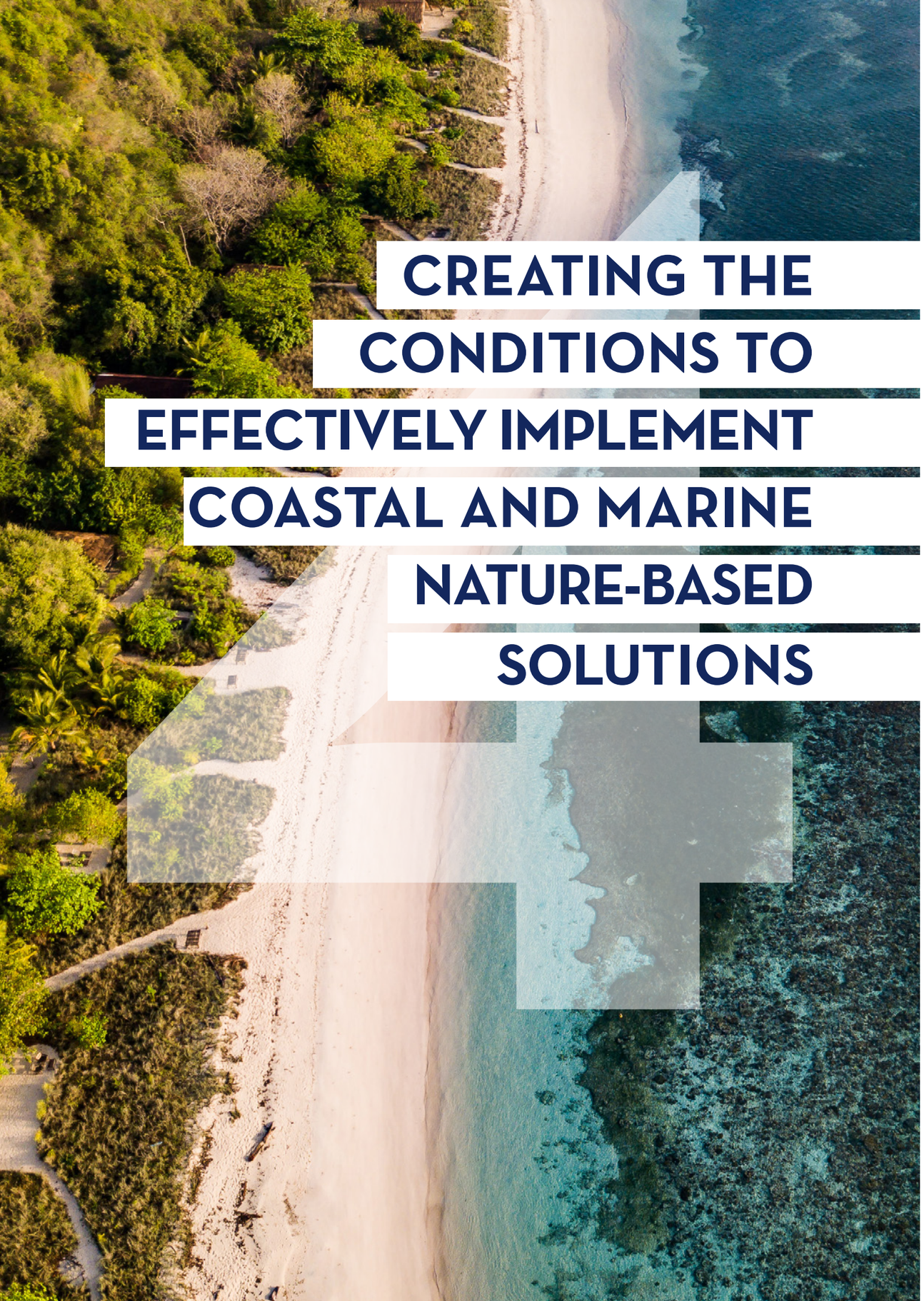
92/ UNFCCC NDC Registry. Singapore's updated NDC (p22)

93/ Chausson, A., et al. (2020). Mapping the effectiveness of nature-based solutions for climate change adaptation. Global Change Biology. Volume 26, Issue 11.

94/ DESA (2021). System of Environmental Economic Accounting (SEEA).

95/ UNFCCC NDC Registry. Pakistan's updated NDC (p40-71)





CREATING THE CONDITIONS TO EFFECTIVELY IMPLEMENT COASTAL AND MARINE NATURE-BASED SOLUTIONS

Multiple opportunities exist to effectively boost climate action by raising ambition and implementing robust NDCs. For example, although it is not compulsory, considering other relevant international or UN governance frameworks in their NDCs can be a useful lever for countries to enhance climate action and build synergies to ensure coherence across national strategies.[96] The 2030 Agenda for Sustainable Development and SDG 14 "Life Below Water" were acknowledged in 30 submissions that included coastal and marine NbS. Additionally, 17 countries made a reference to other ocean-related frameworks and conventions, including the CBD or the Sendai Framework on Disaster Risk Reduction.[97] It is worth pointing out that the UN Decade of Ocean Science for Sustainable Development (2021-2030), for instance, was only included in 1 updated NDC (i.e. Venezuela). Similarly, the UN Decade of Ecosystem Restoration (2021-2030) was mentioned once in the context of coastal and marine NbS. When included, governance frameworks were mostly acknowledged outside the scope of coastal and marine NbS.

Meanwhile, three specific dimensions were identified as essential to implement ambitious and robust strategies: feasibility, societal engagement and transparency.

First, feasibility is key to move forward and effectively implement any aspect of the NDC, including for coastal and marine NbS. In that regard, 68 Parties expressed their intention to further create enabling conditions (e.g., research, technology transfer, capacity-building and finance mobilisation) to translate their NDCs into concrete action regarding coastal and marine NbS (Table 5.I).

Second, in the process of enhancing capacity and inclusive participation, countries also noted the need and importance to engage society in the decision-making process of climate strategies and priorities, to create ownership and durability of outcomes. In addition to country ownership and inclusiveness, the vulnerability and role played by specific groups (e.g., Afro-descendants, youth, women, Indigenous communities) in implementing climate policies was also mentioned, including for coastal and marine NbS. Environmental rights (i.e. access to the unspoiled natural resources that enable survival) were also mentioned. Overall, 43 countries explicitly referred to either/or the importance of knowledge from Indigenous Peoples (IPs) and Local Communities (LCs) and horizontal governance approaches in relation to coastal and marine NbS (Table 5.II).

Third, the value of clarity, transparency, understanding and enhancement of key targets and measures was also outlined. 54 countries included a mention to either/or specific tracking or transparency measures and specific quantitative targets and indicators in relation to coastal and marine NbS (Table 5.III).

Countries are required to provide information on how mitigation (and co-mitigation) targets were developed and quantified through agreed reporting requirements under the Paris Agreement on the Information to facilitate clarity, transparency, and understanding (ICTU). The ICTU will promote comparability and common understanding of progress towards the goals of the Paris Agreement, and is required no later than the 2nd NDC. Many countries demonstrated their political commitment to addressing climate change and data comprehensiveness by including ICTU information in their updated first NDCs.

Additionally, countries can support each other in raising ambition and implementing robust NDCs. Some developed countries committed to support developing countries as part of their NDCs, while many developing countries presented their capacity needs assessments, or indicate their intention to do so as part of conditional commitments.[98,99] Some developing countries have therefore identified their resource needs for increasing their capacity on coastal and

96/ Picourt, L., et al. (2021), Swimming the talk: How to strengthen collaboration and synergies between the Climate and Biodiversity Conventions?, Policy brief, May 2021, OCEAN & CLIMATE PLATFORM, p.1-14

97/ Other ocean-related frameworks and processes referenced included in the analysis: Sendai Framework on Disaster Risk Reduction, Convention on Biological Diversity (CBD) and Post-2020 Global Biodiversity Framework, Food and Agriculture Organization (FAO), Ramsar Convention

98/ Liverman, D., & Mills-Novoa, M., (2019). Nationally Determined Contributions: Material climate commitments and discursive positioning in the NDCs.

99/ Pickering, J., et al. (2019). Conditions (and risks) attached: unpacking developing countries' conditional contributions to the Paris Agreement.

Type	Countries (out of 148 submissions)
a.Feasibility: strengthening support for action Countries that explicitly committed to create enabling conditions for coastal and marine NbS in their new or updated NDCs	68 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Cambodia, Cape Verde, Chile, Colombia, Congo, Costa Rica, Côte d'Ivoire, Dominica, Dominican Republic, DRC, Egypt, El Savador, Equatorial Guinea, Fiji, Gabon, Gambia, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Indonesia, Jordan, Kuwait, Liberia, Malaysia, Maldives, Marshall Islands, Mauritius, Micronesia, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Panama, Papua New Guinea, Qatar, Saint Kitts and Nevis, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Sri Lanka, Sudan, Timor-Leste, Togo, Tunisia, United Arab Emirates, United Republic of Tanzania, Uruguay, Vanuatu, Venezuela, Vietnam
- Research Countries that explicitly committed to increase research for coastal and marine NbS	53 countries: Albania, Angola, Argentina, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Cape Verde, Chile, Colombia, Congo, Costa Rica, Dominica, Dominican Republic, Gabon, Gambia, Guinea, Guinea Bissau, Honduras, Jordan, Kuwait, Liberia, Malaysia, Maldives, Mauritius, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Panama, Papua New Guinea, Qatar, Saint Kitts and Nevis, Saudi Arabia, Senegal*, Seychelles, Sierra Leone, Singapore, Solomon Islands, Sri Lanka, Sudan, Tunisia, United Arab Emirates, United Republic of Tanzania, Uruguay, Vanuatu, Venezuela, Vietnam
- Capacity-building Countries that explicitly committed to increase capacity-building for coastal and marine NbS	37 countries: Albania, Antigua and Barbuda, Argentina, Bangladesh, Belize, Benin, Cape Verde, Chile, Colombia, Côte d'Ivoire, Dominica, Dominican Republic, DRC, Egypt, Equatorial Guinea, Fiji, Haiti, Indonesia, Jordan, Liberia, Maldives, Marshall Islands, Micronesia, Myanmar, Namibia, Panama, Papua New Guinea, Seychelles, Sierra Leone, Solomon Islands, Sri Lanka, Timor-Leste, Togo, Tunisia, United Republic of Tanzania, Uruguay, Vanuatu
- Resource mobilisation Countries that explicitly committed to increase the financial resources allocated to coastal and marine NbS	32 countries: Albania, Antigua and Barbuda, Argentina, Australia, Bangladesh, Barbados, Belize, Cambodia, Cape Verde, Chile, Colombia, Costa Rica, Côte d'Ivoire, Dominica, Dominican Republic, El Salvador, Gambia, Liberia, Marshall Islands, Micronesia, Namibia, Panama, Papua New Guinea, Saint Kitts and Nevis, Saudi Arabia, Seychelles, Timor-Leste, Togo, Tunisia, Uruguay, United Arab Emirates, Vietnam
b. Societal engagement: inclusiveness and participation Countries that explicitly referred to the importance of knowledge from IPs and LCs and/or horizontal governance approaches in relation to coastal and marine NbS in their new or updated NDCs	43 countries: Argentina, Bahamas, Bangladesh, Barbados, Belize, Cambodia, Canada, Chile, Colombia, Costa Rica, Côte d'Ivoire, Dominica, El Savaldor, Fiji, Gambia, Guatemala, Honduras, Indonesia, Kiribati, Liberia, Maldives, Mauritius, Micronesia, Morocco, Myanmar, Nicaragua, Pakistan, Panama, Papua New Guinea, Saint Lucia, Samoa, Sao Tome and Principe, Senegal*, Solomon Islands, Sri Lanka, Sudan, Suriname, Timor-Leste, Tuvalu, United States, Uruguay, Vanuatu, Vietnam
- Recognition of IPs and LCs knowledge Countries that referred to the importance of knowledge from IPs and LCs in relation to coastal and marine NbS	19 countries: Belize, Cambodia, Canada, Chile, Colombia, Costa Rica, Fiji, Guatemala, Honduras, Indonesia, Kiribati, Liberia, Nicaragua, Panama, Papua New Guinea, Samoa, Sri Lanka, Suriname, Vietnam
- Local level governance Countries that referred to the importance of a horizontal governance approach (i.e. wide participation of the society in decision-making) in relation to coastal and marine NbS, including by recognising land rights of IPs and LCs	42 countries: Argentina, Bahamas, Bangladesh, Barbados, Belize, Cambodia, Canada, Chile, Colombia, Costa Rica, Côte d'Ivoire, Dominica, El Savaldor, Fiji, Gambia, Guatemala, Honduras, Indonesia, Kiribati, Liberia, Maldives, Mauritius, Micronesia, Morocco, Myanmar, Nicaragua, Pakistan, Panama, Papua New Guinea, Saint Lucia, Samoa, Sao Tome and Principe, Senegal*, Solomon Islands, Sudan, Suriname, Timor-Leste, Tuvalu, United States, Uruguay, Vanuatu, Vietnam
c. Reporting, monitoring and transparency Countries that included a mention to specific tracking or transparency measures and/or specific quantitative targets and indicators in relation to coastal and marine NbS in their new or updated NDCs	54 countries: Angola, Bahamas, Bahrain, Bangladesh, Belize, Benin, Cambodia, Cameroon, Canada, Cape Verde, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, DRC, El Savador, Equatorial Guinea, Fiji, Guatemala, Guinea, Haiti, Honduras, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Maldives, Mauritania, Mauritius, Micronesia, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Samoa, Senegal*, Seychelles, Sierra Leone, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, United Arab Emirates, Uruguay, Vanuatu, Venezuela, Vietnam
- Tracking process and transparency framework Countries that included a mention to specific tracking or transparency measures in their coastal and marine NbS	23 countries: Bahamas, Cambodia, Canada, Cape Verde, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, DRC, El Salvador, Fji, Guatemala, Honduras, Kenya, Maldives, Micronesia, Panama, Papua New Guinea, Sierra Leone, Suriname, United Arab Emirates, Vietnam
- Quantitative targets and indicators Countries that included specific quantitative targets and indicators in relation to their coastal and marine NbS	45 countries: Angola, Bahamas, Bahrain, Bangladesh, Belize, Benin, Cambodia, Cameroon, Canada, Cape Verde, Costa Rica, Dominica, El Savador, Equatorial Guinea, Fiji, Guatemala, Guinea, Haiti, Kiribati, Kuwait, Lebanon, Liberia, Mauritania, Mauritius, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Panama, Papua New Guinea, Samoa, Senegal*, Seychelles, Sierra Leone, Sri Lanka, Sudan, Timor-Leste, Togo, Tonga, United Arab Emirates, Uruguay, Vanuatu, Venezuela, Vietnam

Countries marked with an asterisk in this analysis refer to countries that submitted a new NDC, i.e. initial NDC submitted between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam, Ecuador*, Holy See*, Philippines*, Senegal* and South Sudan*)

Table 5. Creating the conditions to effectively implement coastal and marine NbS

[out of 148 NDCs received to date, 1 October 2023]

marine NbS. For instance, ***Panama*** indicated in its updated NDC that 8% of its total needs for capacity-building should be allocated to coastal and marine policies and measures (e.g. coastal management, protected areas, blue economy programs).

While all new or updated NDCs outline countries' plans to raise ambition and boost climate action, a review of these submissions does not give a clear indication of how it applies to coastal and marine NbS, unless a country clearly specifies it. Only those countries specifically referring to action measures in their coastal and marine NbS were considered in the discussion below.

(a) Feasibility: strengthening support for action

RESEARCH:

Among the 93 countries that recognised the pressures weighing on the ocean and the threats coming from ocean changes due to climate impacts, 87 countries featured one or more coastal and marine NbS in new or updated NDCs. Most specified that implementing coastal and marine NbS requires science-based policy-making, and therefore robust research, including IPCC reports and assessments. In that regard, for instance, 1 country (i.e. Fiji) referred to the IPCC SROCC. Countries further noted that policies and measures present in new or updated NDCs were based on the best available science, and declared that updates would be made considering new scientific knowledge. 53 countries specifically included a research component related to coastal and marine NbS in their new or updated NDC.

- ***The United Arab Emirates*** plans to undertake "further field research to determine mangrove soil carbon sequestration rates using radiometric dating techniques"[100] to further inform coastal management.

- As part of its adaptation strategy to protect and restore mangrove habitats, ***Bahrain*** aims to establish the Tubli Bay observatory to strengthen existing observation systems to better understand ecological services provided by mangrove habitats in the area.

- After noting the impacts of climate change on fisheries and fishermen (e.g., changing fish stock distribution), the ***Maldives*** committed to facilitate fisheries research initiatives to further study fish stock migration patterns and to adopt more efficient technologies.

- ***Belize*** expressed its intention to complete an in-situ assessment of the below ground carbon stock of mangroves by 2022, leading to the application of relevant IPCC methodologies to assess the feasibility of including seagrass in a wetlands component, alongside a comprehensive assessment of mangrove-based carbon stock, in the national GHG Inventory by 2025. ***Belize*** also undertook to conduct vulnerability assessments of the national coastal area to identify threats and trends, as well as a study of the impacts of ocean acidification on its coastal habitats and marine resources by 2025. Lastly, ***Belize*** will establish a national monitoring program for ocean acidification, and assess coral reef restoration potential.

- ***Sri Lanka*** will conduct fisheries and aquatic resources research to build resilience to climate change. Accordingly, it will identify adaptation measures in fisheries for ocean acidification relations impacts. Similarly, it will encourage research and studies on the most vulnerable species and habitats.

CAPACITY-BUILDING:

Countries expressed their intention to fulfill their goals by developing and strengthening the skills, abilities, processes and resources mobilised. Several countries, for example, specified how commitments will be translated into national policies and legal frameworks. In particular, 37 countries undertook capacity-building with regard to coastal and marine NbS, including the role of LCs, especially for coastal management.

- ***Colombia*** committed to strengthening the institutional capacity of local environmental authorities to facilitate the implantation of ecosystem-based adaptation in the *Unidades Ambientales Costeras* (Coastal Environment Units). It also aims to develop local capacities through co-management, co-ownership and behavior change approaches for agriculture, as well as in blue carbon and ecosystem-based adaptation with legal frameworks related to coastal zones.

- ***Cape Verde*** expressed its intention from 2023 onwards to roll out specific training programmes and to create job opportunities for individuals and entrepreneurs interested in several fields in NbS, marine protection and technology, and sustainable aquaculture.

- ***Sierra Leone*** undertook to develop local institutional capacity to support coastal resources management, as well as to train relevant coastal institutions on climate change adaptation and mangrove conservation. This includes operationalizing a Coastal Chiefdoms Natural Resources Management Network.

RESOURCE MOBILISATION:

Coastal and marine NbS require increased mobilisation of finance to be implemented and scaled-up, as there is a significant ambition gap between actions needed and available financing for coastal and marine NbS.[101] Innovative financial mechanisms and tools can be developed and implemented to increase funds for coastal and marine NbS (e.g., blue bonds, carbon market) and existing financial products and tools can be tailored so they can be used when implementing NbS. Conversely, they can also be used to mobilise financial resources from public and private sources, as well as public-private partnerships. In other words, coastal and marine NbS provide key opportunities for finance mobilisation, and therefore require a specific resource mobilisation strategy. Overall, 32 countries expressed their intention to increase funding for coastal and marine NbS.

- ***Saint Kitts and Nevis*** identified the lack of sustainable financing as a barrier to implement additional measures, and therefore committed to the "establishment of a Protected Area System Plan and sustainable financing mechanism"[102] as part of its strategy on marine resources.

- ***Antigua and Barbuda*** undertook to build a national climate resilient insurance scheme to increase protection of fishers. It will include financing mechanisms to catalyse resilient livelihood activities that are dependent on healthy ecosystems (including in and around protected areas) and the services they provide to small-scale fisheries. It will also de-risk climate-resilient development for the fisheries.

- In line with its blue economy strategy, ***Seychelles*** will support and enable ocean action by technology, financing and capacity building. It will identify financing mechanisms to support its NDC implementation, blue carbon credits and bonds, and other innovative conservation financing mechanisms.

- ***Australia*** expressed its intention to invest in the health and resilience of ocean ecosystems, including by strengthening the management of MPAs and spending an additional $194.5 million on top of existing investments to protect the Great Barrier Reef.

(b) Societal engagement: inclusiveness and participation

Traditional practices and local knowledge from IPs and LCs have long been overlooked by political, economic and technological innovation and advances. However, Parties are increasingly recognising the importance of these ancestral techniques and specific local knowledge for climate ambition and for sustaining the communities that hold this knowledge. Recognising and unlocking their potential for climate action plans can provide multiple opportunities. Some coastal and marine NbS included in the new or updated NDCs already reflect or integrate traditional and Indigenous knowledge and practices, especially in relation to coastal management and conservation.

100/ UNFCCC NDC Registry. United Arab Emirates' Revised NDC (p12)

101/ Sumaila, U.R., et al. (2021). Financing a sustainable ocean economy. Nature Comms 2021.

102/ UNFCCC NDC Registry. Saint Kitts and Nevis' updated NDC (p12)

Among countries that referred to specific knowledge or practices of IPs and LCs, the focus was largely on involvement in agriculture and forestry policies. For example, ***Colombia*** stated in its NDC that Indigenous peoples and Afro-Colombians are key actors to achieve the country's objectives to reduce deforestation. Coastal communities were sometimes acknowledged, but often in terms of vulnerability and threats. 19 countries recognised the importance of IP and LC knowledge and practices in the context of coastal and marine NbS.

- ***Canada*** referred to the UN Declaration on the Rights of Indigenous Peoples, and "supports Indigenous approaches and ways of doing by acknowledging Indigenous Knowledge systems as an equal part in policy development, programs, and decision-making."[103]

- ***Indonesia*** committed to enhancing conservation education, including "engaging adat communities for indigenous knowledge and local wisdom".[104]

Reinstating traditional practices and local knowledge involves moving to a more horizontal governance approach, bringing in not only IPs and LCs but also other marginalised and disadvantaged groups that are disproportionately exposed to ocean risks.[105][106][107] Bottom-up governance is a key feature of effective coastal management and planning, as it informs policies and enhances participation in their implementation. To date, 42 countries mentioned the need for bottom-up governance in the implementation of their coastal and marine NbS (e.g. community-based restoration and/or conservation measures for coastal and marine ecosystems).

- ***The Solomon Islands*** undertook to implement community-based vulnerability mapping, adaptation planning and management approaches to community-based adaptation projects. These projects will be designed and implemented on a whole of island basis.

- ***Samoa*** identified consent from various stakeholders (including coastal villages) as one of the keys to the success of mangrove restoration and planting. They will help to determine the areas on which mangroves will be planted and how they will be both planted and monitored.

- ***Tuvalu*** aims to strengthen community-based conservation programmes on highly vulnerable near-shore marine ecosystems as part of its fisheries management strategy.

- ***Guatemala*** committed to restore and reforest 1500 hectares of mangrove ecosystems by 2025 "with the help of local communities, indigenous peoples and Garifuna, and women and youth groups".[108]

(c) Reporting, monitoring and transparency

"Robustness" of NDCs is evaluated based on the clarity and transparency of information communicated in relation to tracing mechanisms.[109] Countries are encouraged to strengthen their reporting and monitoring frameworks, as well as to include specific and measurable targets in their NDCs (e.g. quantity of carbon sequestered by coastal ecosystems, hectares of mangrove forests planted, percentage of EEZ included in MPAs).

- ***Tonga*** committed to the target of Special Management Areas to 30% of ***Tonga***'s EEZ to maintain the existing fish stocks.

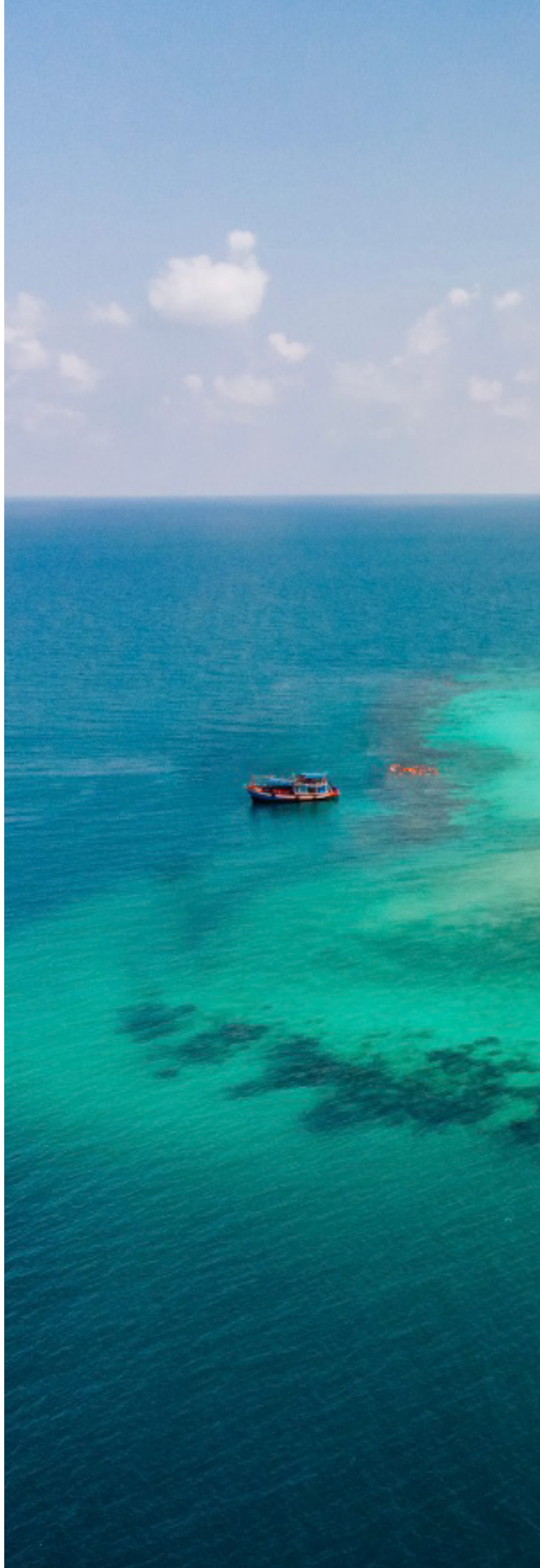
- ***Angola*** mentioned different targets that can be used for coastal management in the context of sea level rise, including the percentage of coastline under marine protection.

- ***Equatorial Guinea*** aims to restore 1.300ha and conserve 24.700 ha of mangroves by 2050, leading to the absorption of 344.500 tCO2eq annually by 2050.

While the NDCs are flexible in nature, the reporting requirements to the Paris Agreement represent some of the legally binding elements. For example, countries are required to submit their ICTU in the 2nd NDC, information on NDC progress in the first Biennial Transparency Report (BTR) for developed country Parties by the end of 2024, as well as continued reporting on carbon sinks, sources, and reservoirs in the national greenhouse gas inventory reporting, and progress made in implementing and achieving NDCs.[110] 23 countries have chosen to strengthen reporting and monitoring capacities in relation to coastal and marine NbS (e.g. commitments to further observe and record activities related to coastal and marine ecosystems, and/or to further integrate the gathered information in policy-making). In addition, 45 countries used specific quantitative targets and indicators (e.g. hectares of mangrove forests under protection).

- ***Chile*** has expressed its intention for three MPAs to have standardised metrics to evaluate mitigation and adaptation capacities by 2025. ***Chile*** also committed to develop and implement management or administration plans for 100% of the MPAs created up to 2020, through monitoring, control, community links and threat control programs by 2030.

- While adopting national policies to develop MPAs, ***Cape Verde*** committed to implement monitoring mechanisms. It specifically aims to "incorporate a mechanism for monitoring and reviewing marine protected areas management plans involving local populations."[111]



103/ UNFCCC NDC Registry. Canada's updated NDC (p7)

104/ UNFCCC NDC Registry. Indonesia's updated NDC (p32)

105/ Tokunaga, K., et al. (2021). Ocean Risks in SIDS and LDCS. ORRAA. Stockholm Resilience Center. Global Resilience Partnership. p1-32.

106/ Wabnitz, C., et al. (2021). Gender Dimensions of Ocean Risk and Resilience in SIDS and Coastal LDCS. ORRAA. Stockholm Resilience Center. Global Resilience Partnership. p1-44.

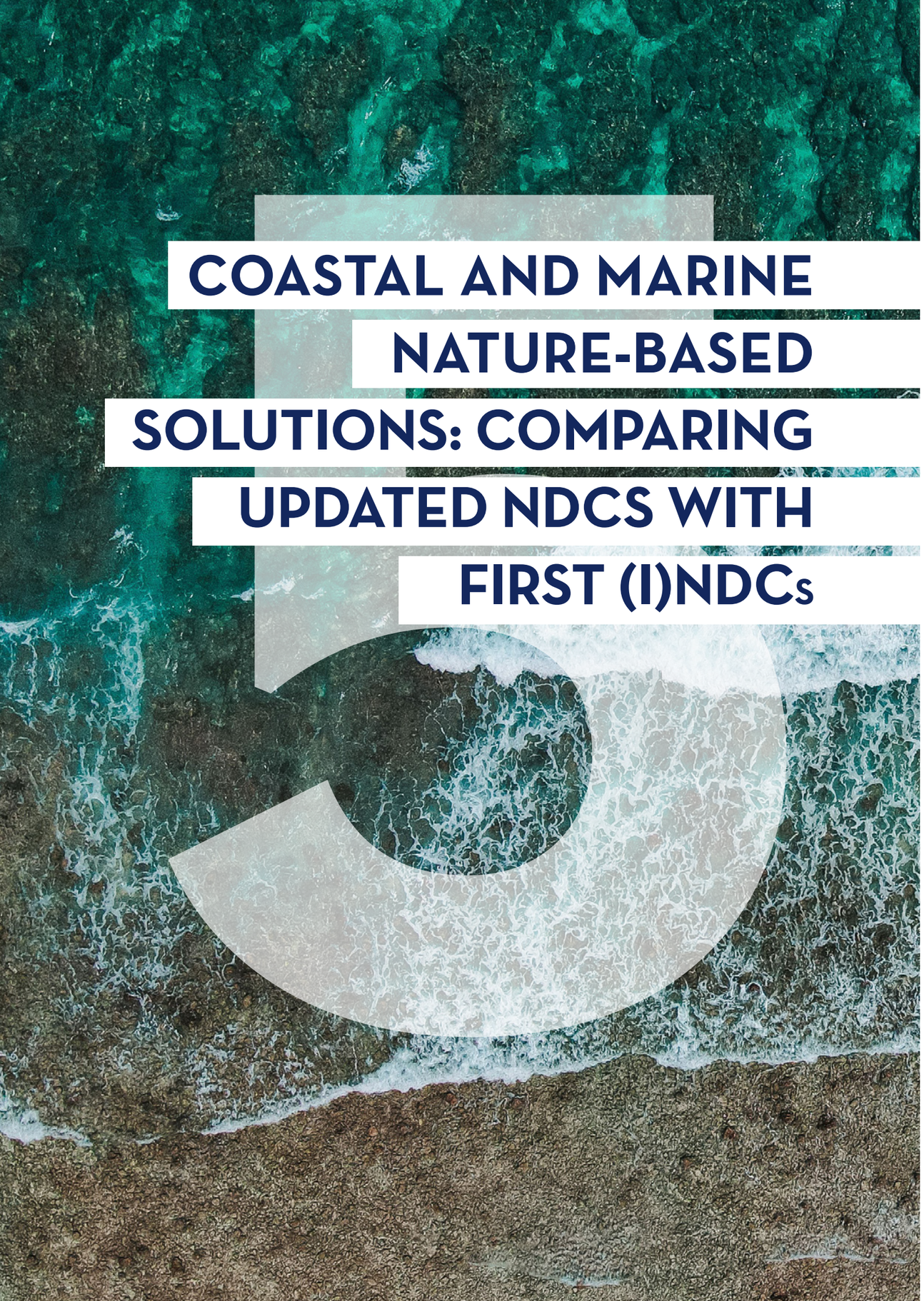
107/ Jouffray, J.B., et al. (2021)

108/ UNFCCC NDC Registry. Guatemala's updated NDC (p40)

109/ UNDP (2020). Climate Promise Quality Assurance Checklist. For Revising Nationally Determined Contributions

110/ The Nature Conservancy (2020b). Practical Implications of the Katowice Climate Package for Developing Country Parties and Land Sector Reporting.

111/ UNFCCC NDC Registry. Cape Verde's updated NDC (p39)



COASTAL AND MARINE NATURE-BASED SOLUTIONS: COMPARING UPDATED NDCS WITH FIRST (I)NDCs

The Paris Agreement requests that Parties' updated NDCs reflect increased ambition compared to the previous submissions (Article 4.3). The following section looks at how countries have included coastal and marine NbS in their updated NDCs, compared to the (I)NDCs submitted ahead of and during COP 21, in 2015 (Table 6). This comparative analysis covers 141 NDCs and the EU-27, hereafter 142 countries, that have submitted both their first and updated NDCs (i.e. in total 168 countries).[112]

For the purpose of this analysis, a country's level of ambition is solely based on the inclusion of additional coastal and marine NbS in updated NDCs compared to (I)NDCs or first NDCs, and is not based on quantitative CO_2 reduction targets, as follows:

- ***Increased level of ambition*** (↑): coastal and marine NbS included as mitigation and/or adaptation measures in updated NDCs, and not included in first NDCs/INDCs.

- ***Renewed level of ambition*** (+): coastal and marine NbS included as mitigation and/or adaptation measures in both updated NDCs and first NDCs/INDCs.

- ***Decreased level of ambition*** (↓): coastal and marine NbS not included as mitigation and/or adaptation measures in updated NDCs, but included in first NDCs/INDCs. In other words, if countries included coastal and marine NbS as part of their measures in their first NDC, but did not refer to their previous commitments in that regard or added complementary coastal and marine NbS in their updated NDCs, their ambition has been considered as "decreased".

- ***Unchanged level of ambition*** (-): coastal and marine NbS not included as mitigation and/or adaptation measures in neither the first NDCs/INDCs nor the updated NDCs. While half of the countries with unchanged ambition have room for improvement, the other half are landlocked countries and have no or limited opportunities to implement coastal and marine NbS in their EEZ.

There is an overall increase in countries' level of ambition with regards to coastal and marine NbS for climate mitigation and adaptation between their first and updated NDCs. This is evidenced by:

- Increased recognition of the pressures weighing on the ocean and/or threats coming from ocean changes

- Increased inclusion of coastal and marine NbS in updated NDCs

- Additional quantitative targets for coastal and marine NbS in updated NDCs

Disclaimer

For the sake of consistency and comparability, first and updated NDCs were analysed following a common methodology (i.e. identical word search). It is also worth noting that while some countries clearly built their updated NDC on their first one, e.g. referencing their previous commitments and mentioning related advances, others chose not to refer to previous targets and/or measures in updated NDCs.

112/ Countries that submitted their first NDCs between 29 March 2019 and 1 October 2023 (i.e. Brunei Darussalam*, Ecuador*, Holy See*, Philippines*, Senegal*, South Sudan*), or those that did not submit their updated NDC as of 1 October 2023 were not considered in this comparative analysis.

INCREASED RECOGNITION OF THE PRESSURES WEIGHING ON THE OCEAN AND/OR THREATS COMING FROM OCEAN CHANGES

In first NDCs, 83 out of 142 countries acknowledged the multiple pressures weighing on the ocean (e.g. ocean acidification, ocean warming) and/or threats coming from ocean changes caused by climate impacts (e.g. sea-level rise, coastal erosion, marine species distribution changes). Among these 83 countries, 63 acted on their observations and included coastal and marine NbS. In updated NDCs, 90 countries recognised these same pressures and threats, and 84 of them included coastal and marine NbS.

Compared to the first NDC submissions, 14 out of 142 countries have added references to ocean vulnerabilities and/or ocean threats in their updated NDC, while 7 countries have no longer included such references. In addition, 76 countries have highlighted ocean vulnerabilities and/or threats in both their first and updated submissions, while 45 countries have not mentioned the ocean in either of the two submissions. Lastly, it is also worth noting that 16 out of the 20 countries that mentioned ocean vulnerabilities without including coastal and marine NbS in their first NDCs did so in their updated NDCs.

INCREASED INCLUSION OF COASTAL AND MARINE NBS IN UPDATED NDCs

In first NDCs, 68 out of 142 included coastal and marine NbS. Among these, 18 countries included coastal and marine NbS for mitigation purposes, 67 included coastal and marine NbS for adaptation purposes, and 17 included for both. In comparison, 93 out of 142 countries included coastal and marine NbS in updated NDCs. Among these, 60 countries included coastal and marine NbS for mitigation purposes, 92 for adaptation purposes, and 59 included for both (Fig. 8). Figures show an increase in the level of ambition, as illustrated in Table 6 below.

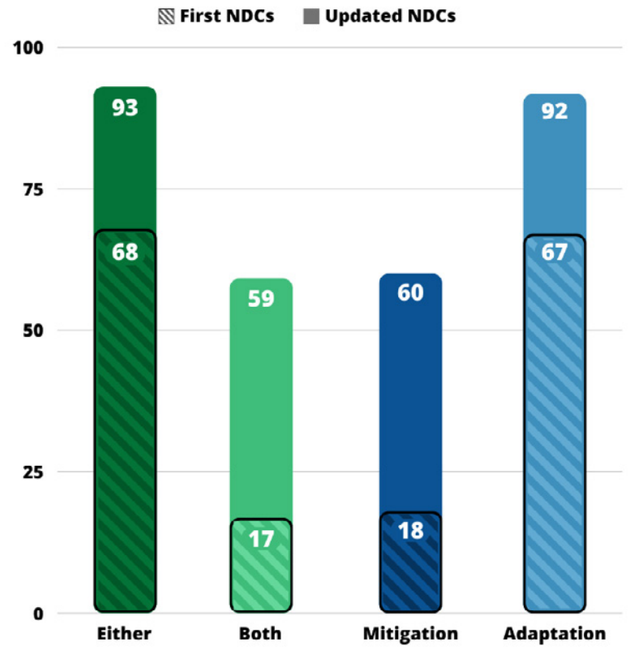


Fig. 8: Coastal and marine NbS for mitigation and/or adaptation in their first and updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform

Tables 6 and 7 outline countries' increased, renewed, decreased or unchanged levels of ambition regarding the inclusion of coastal and marine NbS as part of their mitigation and/or adaptation measures between first and updated NDCs.[113]

- More than half of the countries have **increased their ambition** compared to their first submission, since 80 countries out of 142 have included new coastal and marine NbS in their updated NDC. Among these, 33 countries have added coastal and marine NbS for both mitigation and adaptation - represented in green on Table 6.
- Only a small minority of countries have **renewed their ambition**, since only 10 included coastal and marine NbS in both their first and updated NDCs.
- Few countries have **decreased their ambition**, since only 7 countries have no longer included coastal and marine NbS when they did in their first NDCs.
- Lastly, 45 countries have **unchanged their ambition**, having no specific measure related to coastal and marine NbS in their first and updated NDCs. Among them, 30 are landlocked countries - represented in orange on Table 6.

	Level of ambition			
Types	**Increased (↑)**	**Renewed (+)**	**Unchanged (-)**	**Decreased (↓)**
Coastal and marine Nature-based solutions for mitigation and/or adaptation	80 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Cambodia, Canada, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Cuba, Dominica, Dominican Republic, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea-Bissau Honduras, Iceland, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Mozambique, Myanmar, Namibia, Nauru, Nigeria, Pakistan, Panama, Papua New Guinea, Qatar, Republic of Korea, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, Vietnam	10 countries: Cameroon, Côte d'Ivoire, DRC, Gambia, Guinea, Haiti, India, Peru, Saudi Arabia, United Arab Emirates	45 countries: Andorra, Armenia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Central African Republic, Chad, Eswatini, Ethiopia, European Union, Ghana, Israel, Jamaica, Japan, Kazakhstan, Kyrgyzstan, Lao, Malawi, Mali, Monaco, Mongolia, Montenegro, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Republic of Macedonia, Republic of Moldova, Rwanda, Serbia, State of Palestine, Switzerland, Tajikistan, Turkey, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe	7 countries: DPRK, Georgia, Grenada, Morocco, Nicaragua, Thailand, United Republic of Tanzania

Table 6. Countries' level of ambition on the overall inclusion of coastal and marine NbS in first and updated NDCs as part of mitigation and/or adaptation measures **[out of 142 NDCs received to date, 1 October 2023]**

113/ Authors drew a specific table to aggregate the data and classify countries under the four categories of Table 6 (see above). Points were either allocated or deducted to countries, depending on whether they included or removed coastal and marine NbS for mitigation and/or adaptation.

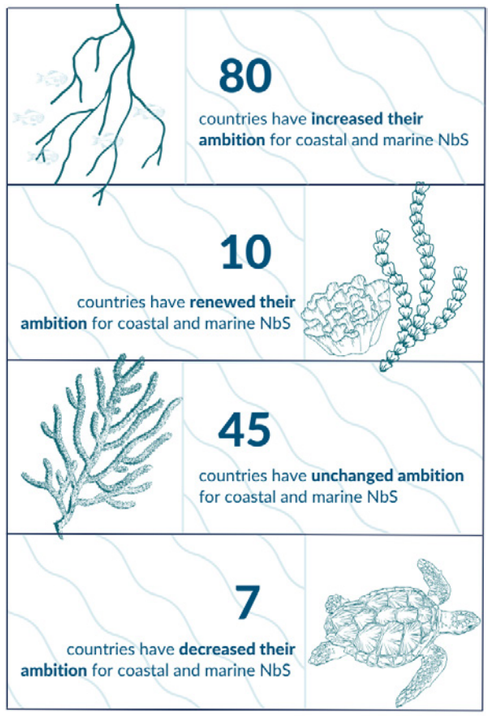


Fig. 9: Countries' level of ambition on the overall inclusion of coastal and marine NbS between their first and updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: : Ocean & Climate Platform

Overall, countries have prioritised the inclusion of new coastal and marine NbS for adaptation measures, with 73 countries adding coastal and marine NbS for adaptation - versus 42 countries for mitigation. This trend continues when looking at countries with unchanged levels of ambition, since 82 countries omitted coastal and marine NbS for mitigation - versus 45 for adaptation. This clearly indicates that there is even greater potential to include coastal and marine NbS as part of countries' mitigation strategies. A similar number of countries have renewed their ambition for mitigation, i.e. 18, and for adaptation, i.e. 17.

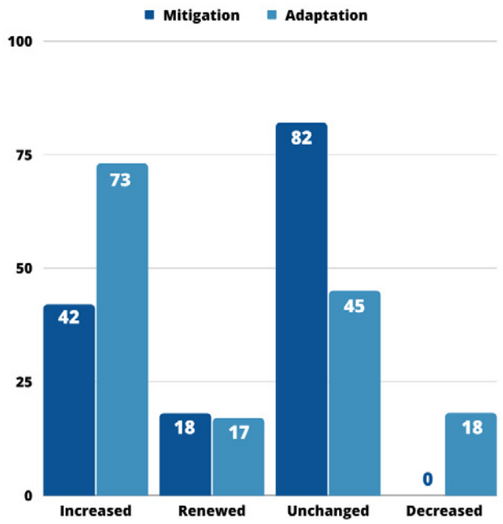


Fig. 10: Countries' level of ambition regarding coastal and marine NbS for mitigation and/or adaptation between their first and updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: : Ocean & Climate Platform

	Level of ambition			
Types	**Increased (↑)**	**Renewed (+)**	**Unchanged (-)**	**Decreased (↓)**
(1) Protecting and restoring marine and coastal ecosystems for mitigation purposes	42 countries: Argentina, Barbados, Benin, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea Bissau, Honduras, Iceland, Indonesia, Kenya, Kuwait, Liberia, Maldives, Mauritius, Mozambique, Namibia, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Seychelles, Sierra Leone, Singapore, Sudan, Tonga, Tuvalu, United Kingdom, United States, Vanuatu, Vietnam	18 countries: Angola, Antigua and Barbuda, Bahamas, Bahrain, Bangladesh, Belize, El Salvador, Guinea, Haiti, Kiribati, Mexico, Myanmar, Nicaragua, Saudi Arabia, Sri Lanka, Suriname, Timor-Leste, United Arab Emirates	82 countries: Albania, Andorra, Armenia, Australia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Dominica, DPRK, DRC, Egypt, Eswatini, Ethiopia, European Union, Gambia, Georgia, Ghana, Grenada, India, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lao, Lebanon, Malawi, Malaysia, Mali, Marshall Islands, Mauritania, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Nauru, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Peru, Qatar, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Serbia, Solomon Islands, Somalia, South Africa, State of Palestine, Switzerland, Tajikistan, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, United Republic of Tanzania, Uruguay, Uzbekistan, Venezuela, Zambia, Zimbabwe	None
(2) Coastal and marine Nature-based solutions for adaptation	73 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Canada, Cape Verde, Chile, China, Colombia, Comoros, Congo, Costa Rica, Dominica, Dominican Republic, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Honduras, Iceland, Indonesia, Jordan, Kenya, Kiribati, Kuwait, Lebanon, Liberia, Malaysia, Maldives, Marshall Islands, Mauritania, Mexico, Micronesia, Mozambique, Myanmar, Namibia, Nauru, Pakistan, Panama, Papua New Guinea, Qatar, Republic of Korea, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela	17 countries: Cambodia, Cameroon, Côte d'Ivoire, Cuba, DRC, Gambia, Guinea, Guinea Bissau, Haiti, India, Mauritius, Nigeria, Peru, Saint Lucia, Saudi Arabia, Singapore, Vietnam	29 countries: Andorra, Armenia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Central African Republic, Chad, Eswatini, Ethiopia, European Union, Ghana, Israel, Jamaica, Japan, Kazakhstan, Kyrgyzstan, Lao, Malawi, Mali, Monaco, Mongolia, Montenegro, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Republic of Macedonia, Republic of Moldova, Rwanda, Serbia, State of Palestine, Switzerland, Tajikistan, Turkey, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe	7 countries: DPRK, Georgia, Grenada, Morocco, Nicaragua, Thailand, United Republic of Tanzania

Table 7. Countries' level of ambition for coastal and marine NbS in first and updated NDCs respectively for mitigation and adaptation measures
[out of 142 NDCs received to date, 1 October 2023]

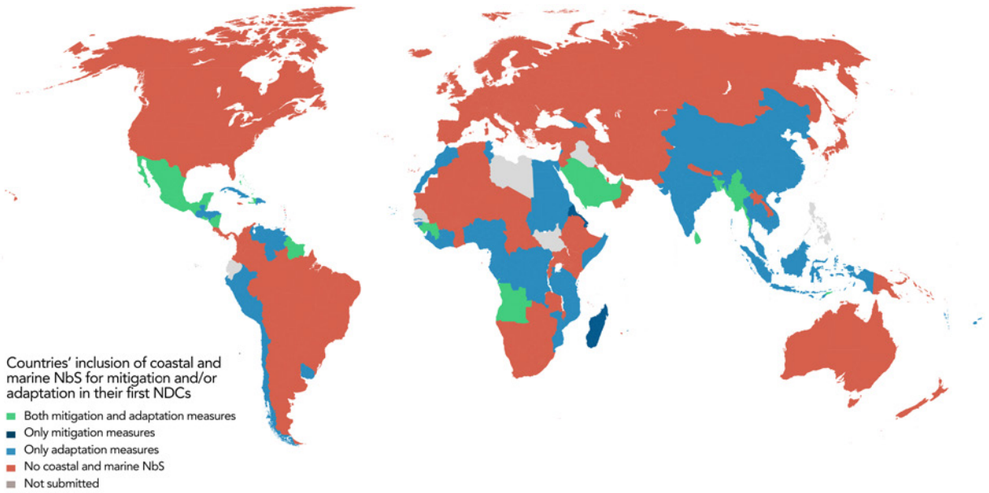


Fig. 11: Countries' inclusion of coastal and marine NbS for mitigation and/or adaptation in their first NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform via Mapchart

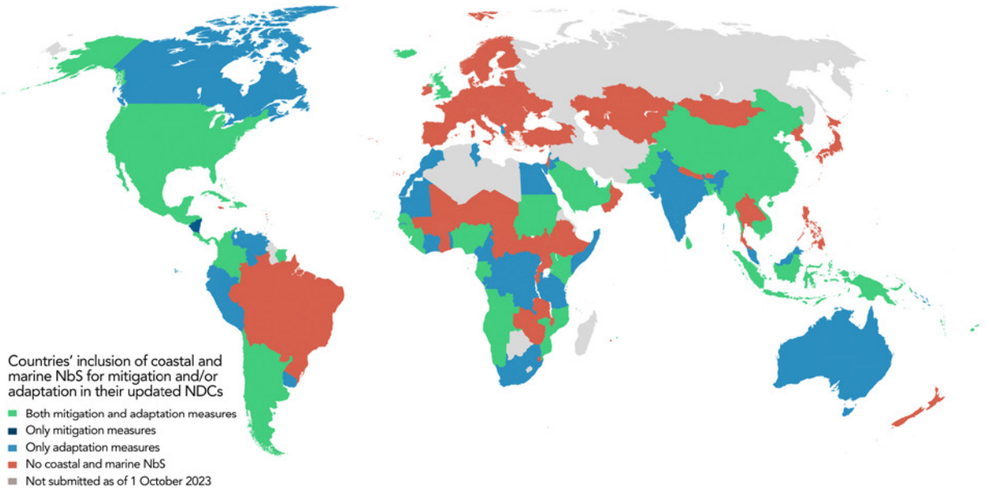


Fig. 12: Countries' inclusion of coastal and marine NbS for mitigation and/or adaptation in their updated NDCs
[out of 142 NDCs received to date, 1 October 2023]
Source: Ocean & Climate Platform via Mapchart

ADDITIONAL QUANTITATIVE TARGETS FOR COASTAL AND MARINE NBS IN UPDATED NDCS

This report looks at how countries included coastal and marine NbS as part of their mitigation and/or adaptation strategies in their first and updated NDCs, considering both the mention of the ocean and the integration of specific measures based on coastal and marine ecosystems. Here, a country is said to have included coastal and marine NbS in its submission when it has included at least one specific measure in that regard. Some countries have opted for quantifiable measures, while others did not.

In the first NDCs, 14 countries out of 142 included quantitative targets to support and implement their coastal and marine NbS as part of their mitigation and/or adaptation measures. In comparison, 44 countries included such targets in their updated NDCs. Among these, 10 countries have included quantitative targets for both their first and updated NDCs. Overall, 33 countries have increased their ambition in that regard, adding new targets to support the implementation of coastal and marine NbS. Additionally, 10 countries have renewed their ambition, having included quantitative targets in both their submissions. Only 4 countries decreased their ambition, omitting quantitative targets in their updated NDC, despite having included it in their first NDC. Lastly, 95 countries omitted quantitative targets in both first and updated NDCs.

Despite a majority of countries omitting quantitative targets for coastal and marine NbS, there is still an increase in the number of countries including such targets. Most of these targets were related to the protection, conservation and restoration of coastal and marine ecosystems for mitigation and/or adaptation purposes, including through the design and implementation of MPAs. These targets were mainly expressed in hectares or percentages. Countries indicated for instance the quantity of mangrove forests (Ha) planted and/or protected.

Moreover, few countries included carbon reduction emission targets in relation to blue carbon ecosystems. It is worth noting in that regard that a handful of countries made a reference to the 2013 IPCC Wetlands Supplement. Therefore, although absent from first NDCs, 14 countries mentioned the IPCC-approved methodology to account for the sequestration capacity of coastal wetlands in their updated NDCs.

1/ COMPARING THE INCLUSION OF COASTAL AND MARINE ECOSYSTEMS AS PART OF MITIGATION MEASURES BETWEEN FIRST AND UPDATED NDCs

The present section focuses on mitigation measures and how countries have included coastal and marine NbS (i.e. protecting blue carbon ecosystems and/or other coastal ecosystems such as algae or kelp) in updated NDCs compared to first NDCs, as illustrated in Table 8.

In first NDCs, 18 countries had included coastal and marine NbS for mitigation purposes, compared to 60 in updated NDCs. Among these, 18 countries have included coastal and marine NbS for mitigation in both their first and updated NDCs.

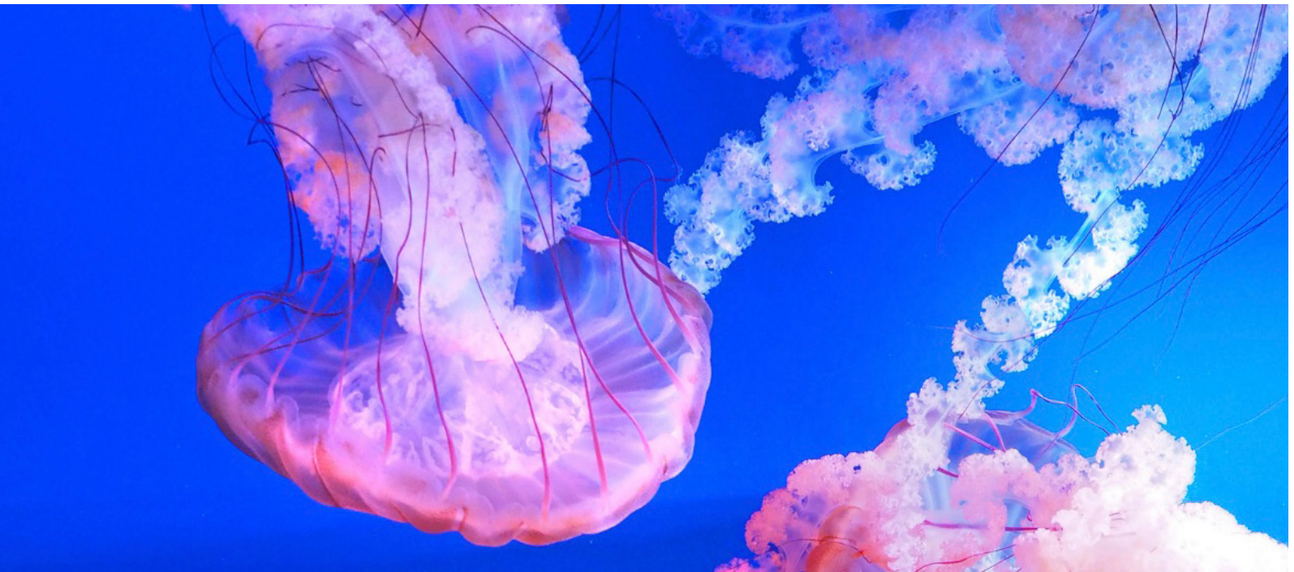
Accordingly, 42 countries have added coastal and marine NbS for mitigation in their updated NDC. This increase could be explained by the development of clear NDC guidance for mitigation actions between the two rounds of submissions. In addition, 18 countries have renewed their ambition, having included coastal and marine NbS for mitigation in both their first and updated NDCs. Lastly, 82 countries never included specific measures in that regard.

Overall, out of 142 countries, 60 have included coastal and marine NbS as part of their mitigation measures in either their first or updated NDC.[114] While there are still a little more than half of NDCs that do not include coastal and marine NbS as part of their mitigation efforts so far, figures show a substantial increase in countries' level of ambition to further include coastal and marine ecosystems in mitigation measures.

The majority of these countries undertook efforts to protect coastal blue carbon ecosystems (Table 8.1.a) as a matter of priority, in comparison to other marine and coastal ecosystems (Table 8.1.b). This is consistent with the fact that coastal blue carbon ecosystems (i.e. mangrove, seagrass and salt marsh) are the three coastal ecosystems that have an IPCC-approved methodology to account for their sequestration capacity through the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (i.e. IPCC Wetlands Supplement). However, it is interesting to note that some countries (see Table 8.1.b) have included other coastal and marine ecosystems[115], which can be perceived as a growing interest to better grasp the mitigation role of the ocean, beyond coastal wetlands.

114/ Among the 42 countries that added new coastal and marine NbS for mitigation purposes, 36 added one new type of coastal and marine NbS and 6 added two - thereby protecting a wide diversity of coastal wetlands.

115/ The expression "other coastal and marine ecosystems" encompasses here algae, kelp, sabkha, soft-bottom benthic habitats and coastal peatlands.



	Level of ambition			
Types	**Increased (↑)**	**Renewed (+)**	**Unchanged (-)**	**Decreased (↓)**
(1) Protecting and restoring marine and coastal ecosystems for mitigation purposes	42 countries: Argentina, Barbados, Benin, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea Bissau, Honduras, Iceland, Indonesia, Kenya, Kuwait, Liberia, Maldives, Mauritius, Mozambique, Namibia, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Seychelles, Sierra Leone, Singapore, Sudan, Tonga, Tuvalu, United Kingdom, United States, Vanuatu, Vietnam	18 countries: Angola, Antigua and Barbuda, Bahamas, Bahrain, Bangladesh, Belize, El Salvador, Guinea, Haiti, Kiribati, Mexico, Myanmar, Nicaragua, Saudi Arabia, Sri Lanka, Suriname, Timor-Leste, United Arab Emirates	82 countries: Albania, Andorra, Armenia, Australia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Dominica, DPRK, DRC, Egypt, Eswatini, Ethiopia, European Union, Gambia, Georgia, Ghana, Grenada, India, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lao, Lebanon, Malawi, Malaysia, Mali, Marshall Islands, Mauritania, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Nauru, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Peru, Qatar, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Serbia, Solomon Islands, Somalia, South Africa, State of Palestine, Switzerland, Tajikistan, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, United Republic of Tanzania, Uruguay, Uzbekistan, Venezuela, Zambia, Zimbabwe	None
(a) Coastal blue carbon ecosystems	41 countries: Barbados, Benin, Cambodia, Cape Verde, Chile, China, Colombia, Costa Rica, Cuba, Dominican Republic, Equatorial Guinea, Fiji, Gabon, Guatemala, Guinea Bissau, Honduras, Iceland, Indonesia, Kenya, Kuwait, Liberia, Maldives, Mauritius, Mozambique, Namibia, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Lucia, Seychelles, Sierra Leone, Singapore, Sudan, Tonga, Tuvalu, United Kingdom, United States, Vanuatu, Vietnam	18 countries: Angola, Antigua and Barbuda, Bahamas, Bahrain, Bangladesh, Belize, El Salvador, Guinea, Haiti, Kiribati, Mexico, Myanmar, Nicaragua, Saudi Arabia, Sri Lanka, Suriname, Timor-Leste, United Arab Emirates	83 countries: Albania, Andorra, Argentina, Armenia, Australia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Dominica, DPRK, DRC, Egypt, Eswatini, Ethiopia, European Union, Gambia, Georgia, Ghana, Grenada, India, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lao, Lebanon, Malawi, Malaysia, Mali, Marshall Islands, Mauritania, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Nauru, Nepal, New Zealand, Niger, Norway, Oman, Paraguay, Peru, Qatar, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Serbia, Solomon Islands, Somalia, South Africa, State of Palestine, Switzerland, Tajikistan, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, United Republic of Tanzania, Uruguay, Uzbekistan, Venezuela, Zambia, Zimbabwe	None
(b) Other marine and coastal ecosystems	8 countries: Argentina, Chile, Costa Rica, Fiji, Kiribati, Liberia, Mauritius, Pakistan	1 country: United Arab Emirates	133 countries: Albania, Andorra, Angola, Antigua and Barbuda, Armenia, Australia, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, China, Colombia, Comoros, Congo, Côte d'Ivoire, Cuba, Dominica, Dominican Republic, DPRK, DRC Egypt, El Salvador, Equatorial Guinea, Eswatini, Ethiopia, European Union, Gabon, Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea Bissau, Haiti, Honduras, Iceland, India, Indonesia, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Lao, Lebanon, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nauru, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Panama, Paraguay, Papua New Guinea, Peru, Qatar, Republic of Korea, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Serbia, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, State of Palestine, Sudan, Suriname, Switzerland, Tajikistan, Thailand, Timor-Leste, Togo, Tonga, Tunisia, Turkey, Tuvalu, Uganda, Ukraine, United Kingdom, United Republic of Tanzania, United States, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Zambia, Zimbabwe	None

Table 8. Countries' level of ambition for coastal and marine NbS as part of mitigation measures between first and updated NDCs
[out of 142 NDCs received to date, 1 October 2023]

(a) Coastal blue carbon ecosystems

In total, 18 countries out of 142 have included blue carbon ecosystems as part of their mitigation measures in their first NDC, and 59 have included these ecosystems in their updated NDC - 3 times more compared to the first round of NDCs. Therefore, 41 countries have increased their ambition in their updated NDC compared to their first one, and none decreased their ambition. In addition, 18 countries renewed their ambition, since they included coastal blue carbon ecosystems in both their first and updated NDCs. Lastly, the remaining 83 countries did not include blue carbon as part of their mitigation measures in either of their two submissions. Overall, 59 out of 142 countries have included the protection of coastal blue carbon ecosystems as part of their mitigation measures in either their first and/or updated NDCs.

Examples of increased ambition:

- In its first NDC, the ***United States (US)*** expressed its intention to include all categories of emissions by sources and removals by sinks, without specifically mentioning blue carbon ecosystems. In its updated NDC, the US committed to supporting "efforts to increase sequestration in waterways and oceans by pursuing 'blue carbon'".

- ***Panama*** did not include blue carbon or other coastal ecosystems for mitigation in its first NDC. It raised its level of ambition in its updated NDC, by including mangroves and coastal wetlands into its national strategy. More specifically, it designed projects to protect and restore mangroves for mitigation purposes. ***Panama*** also committed to integrating blue carbon in the national inventory, following the methodology outlined in the 2013 IPCC Wetlands Supplement.

Example of renewed ambition:

- In its first NDC, ***Guinea*** acknowledged the mitigation benefits of mangrove forests, and committed to slow down deforestation while developing reforestation plans and sustainably managing these forests. ***Guinea*** maintained its efforts in its updated NDC, as it undertook to significantly reduce pressures on forests and deforestation. Guinea continued to develop measures to sustainably manage mangrove forests and create new protected areas in affected areas.

A great number of countries acknowledged the mitigation role of the ocean, recognising blue carbon ecosystems as carbon sinks. Many countries committed to taking action and implementing coastal and marine NbS as part of their mitigation measures. However, few countries actually accounted for blue carbon ecosystems in their GHG inventories and/or mentioned the carbon offset potential of such ecosystems.[116] For example, ***Saint Lucia*** recalled in its updated NDC that "the value of Saint Lucia's forest cover as a carbon sink is recognized, despite the fact that these values are not included in the projections". Only a limited number of countries have included quantitative targets associated with blue carbon accounting and offsetting. Only 3 countries mentioned LULUCF activities with regard to mangroves in first NDCs, and the figure rises to 12 in updated NDCs. Nonetheless, one could expect enhanced action in that regard, as some countries are currently paving the way for action. Such countries are currently assessing national opportunities to account for blue carbon ecosystems in their GHG inventory in the next round of NDC submissions.

- ***Liberia*** mentioned key quantitative measures and targets in relation to blue carbon accounting in updated NDC. It expressed its intention to "fully integrate GHG fluxes (emissions and removals) from mangrove ecosystems [...] into the next national GHG inventory by 2030"[117]. In addition, ***Liberia*** undertook to reduce GHG emissions by a total of 1,800 GgCO2e through avoided conversion and draining of mangrove ecosystems by 2030. ***Liberia*** also committed to establishing a "Natural Capital Accounting system for coastal zones and forests by 2030", in relation to its National Wetlands Policy.

- In updated NDC, ***Belize*** undertook to maintain and enhance the carbon storage functions of natural carbon sinks, through the protection and restoration of mangrove forest and seagrass. ***Belize*** also committed to enhancing the capacity of the country's mangrove and seagrass ecosystems "to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO2e between 2021 and 2030 through mangrove restoration".[118]

- ***Seychelles*** is currently mapping the full extent of the blue carbon seagrass and mangrove ecosystems within its EEZ, as well as measuring their carbon stock values. These assessments will inform ***Seychelles'*** goal to include these ecosystems in their GHG inventory by 2025. ***Seychelles*** will protect its blue carbon ecosystems, i.e. at least 50% of its seagrass and mangrove ecosystems by 2025, and 100% of seagrass and mangrove ecosystems by 2030.

(b) Other coastal and marine ecosystems

Only 1 country (i.e. United Arab Emirates) had integrated coastal ecosystems other than blue carbon (e.g. algae, kelp) as part of their mitigation measures in their first NDC, versus 9 countries in updated NDCs. 8 countries have added other coastal and marine ecosystems as part of their mitigation measures in their updated NDCs, thus increasing their level of ambition, and the United Arab Emirates renewed its ambition. Other coastal and marine ecosystems remain largely absent from both first and updated NDCs, as 133 countries have not included these ecosystems in their submissions.

Overall, out of 142 countries, only 10 included the protection of coastal ecosystems other than blue carbon as part of their mitigation measures in either their first and/or updated NDC. Figures reflect a more unchanged ambition for the protection and restoration of other coastal ecosystems, as an overwhelming majority of countries omitted such measures in both their first and updated NDCs. Nonetheless, it is important to bear in mind here that unchanged ambition is not unexpected. It is no surprise that these ecosystems remain largely absent from mitigation measures, as they are not covered by the IPCC Wetlands Supplement. The carbon accounting uncertainties mean that it is not currently feasible to incorporate other coastal and marine ecosystems into mitigation measures that require carbon accountability.

Example of increased ambition:

- In its first NDC, ***Costa Rica*** did not commit to measures related to coastal and marine ecosystems. In its updated NDC, ***Costa Rica*** undertook to protect other coastal wetlands, in line with its blue carbon strategy. For instance, it expressed its intention to protect coastal peatlands and increase funding to conserve such ecosystems.

116/ Actual emission targets associated with coastal and marine ecosystems were not thoroughly specified in this report, as few countries addressed this issue and that it is not possible to have an accurate analysis of such emission targets. Language is often too vague and not specifically applied to blue carbon. For instance, there is often no distinction between emission targets associated with forests or mangroves.

117/ UNFCCC NDC Registry. Liberia's updated NDC (p22)

118/ UNFCCC NDC Registry. Belize's updated NDC (p16)

2/ COMPARING THE INCLUSION OF COASTAL AND MARINE ECOSYSTEMS AS PART OF ADAPTATION MEASURES BETWEEN FIRST AND UPDATED NDCs

The present section focuses on countries' level of ambition regarding the inclusion of coastal and marine NbS for adaptation - i.e. protecting, conserving and restoring coastal and marine ecosystems; coastal zones management and protected areas; climate-ready fisheries and fishing communities - in updated NDCs compared to first NDCs, as illustrated in Table 9 below.

In first NDCs, 67 countries had included coastal and marine NbS for adaptation purposes, against 92 in updated NDCs. Among these, 62 countries have included coastal and marine NbS for adaptation in both their NDCs.

Since the first NDC submissions, 73 countries added coastal and marine NbS for adaptation in their updated NDC[119], while 7 countries have no longer included them. Additionally, 17 countries have renewed their ambition, having included coastal and marine NbS for adaptation in both their first and updated NDCs. Lastly, the remaining 45 countries never had specific measures in that regard.

Overall, out of 142 countries, 97 have included coastal and marine NbS for adaptation in their first and/or updated NDCs. Countries have prioritised measures to sustainably manage coastal zones and implement new MPAs, with 61 countries having added such measures (Table 9.2.b) - compared to 28 countries for coastal and marine ecosystem protection (Table 9.2.a) and 36 for climate-ready fisheries (Table 9.2.c).

	Level of ambition			
Types	**Increased (↑)**	**Renewed (+)**	**Unchanged (-)**	**Decreased (↓)**
(a) Protecting and restoring coastal and marine ecosystems	28 countries: Albania, Antigua and Barbuda, Argentina, Barbados, China, Colombia, Comoros, Costa Rica, Dominica, El Salvador, Equatorial Guinea, Guatemala, Iceland, Kenya, Malaysia, Mauritania, Micronesia, Mozambique, Namibia, Nauru, Pakistan, Panama, Papua New Guinea, Qatar, Samoa, Sierra Leone, United Kingdom, Vanuatu	41 countries: Bahamas, Bahrain, Bangladesh, Belize, Benin, Cambodia, Cameroon, Cape Verde, Chile, Congo, Cuba, Dominican Republic, Fiji, Gabon, Gambia, Guinea, Guinea Bissau, Hati, Indonesia, Lebanon, Liberia, Maldives, Marshall Islands, Mauritius, Mexico, Myanmar, Saint Lucia, Saudi Arabia, Seychelles, Singapore, Somalia, Sri Lanka, Sudan, Suriname, Timor-Leste, Togo, Tunisia, United Arab Emirates, Uruguay, Venezuela, Vietnam	66 countries: Andorra, Angola, Armenia, Australia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Canada, Central African Republic, Chad, Côte d'Ivoire, DPRK, Egypt, Eswatini, Ethiopia, European Union, Georgia, Ghana, India, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kiribati, Kuwait, Kyrgyzstan, Lao, Malawi, Mali, Monaco, Mongolia, Montenegro, Nepal, New Zealand, Niger, Nigeria, Norway, Oman, Paraguay, Peru, Republic of Korea, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Sao Tome and Principe, Serbia, Solomon Islands, South Africa, State of Palestine, Switzerland, Tajikistan, Tonga, Turkey, Tuvalu, Uganda, Ukraine, United States, Uzbekistan, Zambia, Zimbabwe	7 countries: DRC, Grenada, Honduras, Morocco, Nicaragua, Thailand, United Republic of Tanzania
(b) Coastal zone management and protected areas	61 countries: Albania, Angola, Antigua and Barbuda, Argentina, Australia, Bahamas, Bahrain, Barbados, Belize, Canada, Cape Verde, Chile, Colombia, Congo, Costa Rica, Dominica, Dominican Republic, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Guatemala, Honduras, Indonesia, Jordan, Kenya, Kuwait, Lebanon, Liberia, Malaysia, Marshall Islands, Mauritania, Mexico, Micronesia, Myanmar, Namibia, Nauru, Nigeria, Pakistan, Panama, Papua New Guinea, Republic of Korea, Saint Kitts and Nevis, Samoa, Sao Tome and Principe, Seychelles, Sierra Leone, Solomon Islands, South Africa, Suriname, Timor-Leste, Togo, Tonga, Tuvalu, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela	27 countries: Bangladesh, Benin, Cambodia, Cameroon, China, Côte d'Ivoire, Cuba, DRC, Gambia, Guinea, Guinea Bissau, Haiti, India, Kiribati, Maldives, Mauritius, Morocco, Mozambique, Saint Lucia, Saudi Arabia, Singapore, Somalia, Sri Lanka, Sudan, Tunisia, United Republic of Tanzania, Vietnam	51 countries: Andorra, Armenia, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Eswatini, Ethiopia, European Union, Ghana, Iceland, Israel, Jamaica, Japan, Kazakhstan, Kyrgyzstan, Lao, Malawi, Mali, Monaco, Mongolia, Montenegro, Nepal, New Zealand, Nicaragua, Niger, Norway, Oman, Paraguay, Peru, Qatar, Republic of Macedonia, Republic of Moldova, Rwanda, Serbia, State of Palestine, Switzerland, Tajikistan, Thailand, Turkey, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe	3 countries: DPRK, Georgia, Grenada
(c) Climate-ready fisheries and fishing communities	36 countries: Albania, Antigua and Barbuda, Argentina, Bangladesh, Benin, Comoros, Congo, DRC, Egypt, El Salvador, Fiji, Gabon, Guatemala, Kenya, Kiribati, Kuwait, Lebanon, Malaysia, Maldives, Micronesia, Myanmar, Nauru, Panama, Republic of Korea, Sao Tome and Principe, Somalia, Sri Lanka, Sudan, Timor-Leste, Togo, Tonga, Tunisia, Tuvalu, United Arab Emirates, United Kingdom, Vanuatu	21 countries: Angola, Bahamas, Belize, Cambodia, Cameroon, Cape Verde, Costa Rica, Côte d'Ivoire, Cuba, Dominica, Gambia, Haiti, Liberia, Mauritius, Morocco, Mozambique, Peru, Seychelles, Sierra Leone, United Republic of Tanzania, Vietnam	84 countries: Andorra, Armenia, Australia, Bahrain, Barbados, Belarus, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Burkina Faso, Burundi, Canada, Central African Republic, Chad, Chile, China, Colombia, Dominican Republic, DPRK, Equatorial Guinea, Eswatini, Ethiopia, European Union, Georgia, Ghana, Grenada, Guinea, Guinea Bissau, Honduras, Iceland, India, Indonesia, Israel, Jamaica, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lao, Malawi, Mali, Marshall Islands, Mauritania, Mexico, Monaco, Mongolia, Montenegro, Namibia, Nepal, New Zealand, Nicaragua, Niger, Norway, Oman, Pakistan, Paraguay, Papua New Guinea, Qatar, Republic of Macedonia, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Saint Lucia, Samoa, Saudi Arabia, Serbia, Singapore, Solomon Islands, South Africa, State of Palestine, Suriname, Switzerland, Tajikistan, Thailand, Turkey, Uganda, Ukraine, United States, Uruguay, Uzbekistan, Venezuela, Zambia, Zimbabwe	1 country: Nigeria

Table 9. Countries' level of ambition for coastal and marine NbS as part of adaptation measures between first and updated NDC

[out of 142 NDCs received to date, 1 October 2023]

119/ Out of 73 countries, 29 have committed to a new type of coastal and marine NbS, 21 to two new types and 23 to all the three types of coastal and marine NbS for adaptation identified in this report.

(a) Protecting and restoring coastal and marine ecosystems:

In their first NDCs, out of the 142 countries, 48 had specifically included measures to protect and restore coastal and marine ecosystems for adaptation purposes. In comparison, 69 countries included these measures in their updated NDCs. Among these, 41 countries included them in both NDCs.

Since the first NDC submissions, 28 countries have added measures to protect and restore coastal and marine ecosystems in their updated NDC, while 7 countries have no longer included such measures. Additionally, 41 countries renewed their ambition, including measures to protect and restore coastal and marine ecosystems for adaptation purposes in both their first and updated NDCs. Lastly, the remaining 66 countries did not include these measures in either of the two submissions.

Overall, 76 out of 142 countries have included the protection and restoration of coastal and marine ecosystems as part of their adaptation measures in either their first and/or updated NDC.

Figures show that a growing number of countries included the protection and restoration of coastal and marine ecosystems as part of their adaptation measures in their updated NDCs. It is also worth noting that a large number of countries included measures to protect and restore coastal and marine ecosystems in both their first and updated NDCs, in comparison with other coastal and marine NbS for adaptation.

Examples of increased ambition:

- ***Barbados*** highlighted in its first NDC that "sea levels are rising" and that "coral bleaching events are more frequent", in line with "climate change projections for the Caribbean region"[120]. Despite mentioning the impacts of climate change on coastal ecosystems and communities, ***Barbados*** did not commit to specific coastal and marine NbS. However, it did increase its level of ambition, by integrating such solutions in its updated NDC. For instance, ***Barbados*** expressed its intention to "restore vulnerable coral reef ecosystems, particularly on the west and south coasts of the island" and to "help preserve for future generations the coastal ecosystems, shorelines and coral reefs"[121] in relation to its new Water Protection and Land Use Policy (e.g. protecting coastal coral reefs, mangroves and seagrass beds using NbS).

- While ***Mozambique*** did not include coastal and marine ecosystems in its first NDC, it committed to the regeneration of mangroves and implementation of protective measures for "seagrass, corals and other breeding areas for fish" in its updated NDCs.[122]

Example of renewed ambition:

- In its first NDC, ***Indonesia*** undertook to build climate resilience to "protect and sustain these environmental services by taking an integrated landscape-based approach"[123] in managing coastal and marine ecosystems. It worked towards ecosystem conservation and coastal zone protection at once. In its updated NDC, ***Indonesia*** undertook to develop "climate resilient coastal zone" and to restore "degraded coastal zone as essential ecosystem". Indonesia "has taken into account the Sustainable development Goals (SDGs) particularly on [...] conservation and sustainable use of the oceans, seas and marine resources".[124]

Example of decreased ambition:

- ***Nicaragua*** committed to the protection, conservation and sustainable use of wetlands and mangroves in its first NDC, recalling the strong adaptation benefits of such ecosystems. It expressed its intention to implement specific legislation on mangrove forests to enhance the development of mangrove habitats. In comparison, ***Nicaragua*** did not include these ecosystems in its updated NDC.

120/UNFCCC NDC Registry. Barbados' First NDC (p1)
121/ UNFCCC NDC Registry. Barbados' Updated NDC (p25)
122/ UNFCCC NDC Registry. Mozambique's Updated NDC (p21)
123/ UNFCCC NDC Registry. Indonesia's First NDC (p11)
124/ UNFCCC NDC Registry. Indonesia's updated NDC (p11)

(b) Coastal zone management and protected areas

Out of 142 countries, 43 had specifically included measures to sustainably manage coastal zones and implement MPAs for adaptation purposes in their first NDCs. In comparison, 88 countries included these measures in their updated NDCs. Among these, 5 countries (i.e. Guinea Bissau, Haiti, Mauritius, Morocco and Sri Lanka) included measures to sustainably manage coastal zones and implement new MPAs in both their submissions.

Since the first NDC submissions, 61 countries added measures to sustainably manage coastal zones and implement new MPAs in their updated NDC[125], while 3 countries have no longer included these measures. Additionally, 27 countries renewed their ambition, having included measures to manage coastal zones and/or implement MPAs for adaptation purposes in both their first and updated NDCs. Lastly, the remaining 51 countries did not include these measures in either of the two submissions.

Overall, out of 142 countries, 91 included the sustainable management of coastal zones and/or the implementation of new MPAs as part of their adaptation measures in either their first and/or updated NDCs. These figures show that a growing number of countries added measures for coastal zone management and protected areas in their updated NDCs. More than half of the countries have included measures for coastal zone management and protected areas in their updated NDCs.

Examples of increased ambition:

- ***Liberia*** referred to coastal vulnerabilities in its first NDC, stating that "coastal areas in Liberia are the most populated and economically vibrant areas" and that "sea erosion continues to pose increasing threats to the shorelines of coastal cities including major infrastructures and investments",[126] but did not include any coastal and marine NbS for adaptation. In its updated NDC, ***Liberia*** included ecosystem-based adaptation measures in coastal zones, e.g. "design[ing] and implement[ing] green-gray infrastructure approaches along 60% of ***Liberia***'s highly vulnerable coastline by 2030".[127]

- In its first NDC, ***Sierra Leone*** acknowledged its vulnerability to the adverse effects of climate change and expressed its willingness to maintain resilience of marine ecosystems, without committing to the implementation of protected areas to enhance the resilience and sustainably manage the resources of these ecosystems. In its updated NDC, ***Sierra Leone*** proposed to support the scaling of MPAs in its national waters.

Example of renewed ambition:

- In its first NDC, the ***United Republic of Tanzania*** undertook to strengthen management of coastal resources and beach erosion/sea-level rise control systems. In addition, it expressed its intention to improve monitoring and early warning systems of both sea-level rise impacts and extreme weather events for building adaptive capacity. In comparison, the ***United Republic of Tanzania*** maintained its efforts in its updated NDC, which also included measures to strengthen the management of coastal and marine resources and improve coastal adaptation to the adverse impacts of climate change.

Example of decreased ambition:

- In its first NDC, ***Grenada*** presented its strategy to build coastal resilience. The strategy included a detailed mapping of coastal ecosystems, the development of integrated coastal zone management policies, as well as community- and ecosystem-based adaptation actions (e.g. coral restoration and mangrove rehabilitation). Yet, ***Grenada*** did not include coastal and marine NbS in its updated NDC.

125/ More precisely, 45 countries added measures to sustainably manage coastal zones, versus 40 to implement new MPAs - suggesting that they prioritised measures to manage coastal zones over measures to implement and manage MPAs.
126/ UNFCCC NDC Registry. Liberia's first NDC (p13)
127/ UNFCCC NDC Registry. Liberia's updated NDC (p32)

(c) Climate-ready fisheries and small-scale fishing communities

Out of 142 countries, 22 had included climate-ready fishing measures for adaptation purposes in their first NDCs, compared to 57 countries including them in their updated NDCs. Among these, 21 countries have included such measures in both their first and updated NDCs.

Since the first NDC submissions, 36 countries added climate-ready fishing measures for adaptation in their updated NDC, while 1 country has no longer included these measures. In addition, 21 countries renewed their ambition, having included climate-ready fishing measures for adaptation in both their first and updated NDCs. Lastly, the remaining 84 countries did not include such measures in their NDCs.

Overall, out of 142 countries, 58 included climate-ready fisheries as part of their adaptation measures in either their first and/or updated NDC. There is an increase in overall ambition, as 36 countries that did not include climate-ready fishing measures in their initial NDC, did so in their updated one.

Examples of increased ambition:

- ***Sao Tome and Principe*** acknowledged in its first NDC its vulnerability and fragility as a developing small island state, recognising "the negative impacts of climate change [...] in all sectors of the national economy"[128] including fishing and coastal zone management - but did not include any measures in relation to climate-ready fisheries. However, ***Sao Tome and Principe*** increased its level of ambition in its updated NDC, as it expressed its commitment to strengthening infrastructure, equipment, and shifting to sustainable techniques for the fisheries sector.

- ***Somalia*** highlighted the vulnerability of its fishing stocks in its first NDC, mentioning for example how sea-level rise threatens coastal communities through "affecting fish nesting and fishing ground, e.g. wetlands, and coral reefs, mangrove forests and marshes"[129]. However, it built on these observations in its updated NDC, and committed to enhancing the resilience of the fisheries value chains by promoting climate-smart fisheries development and to strengthening the management of the fishery sector for resilience creation.

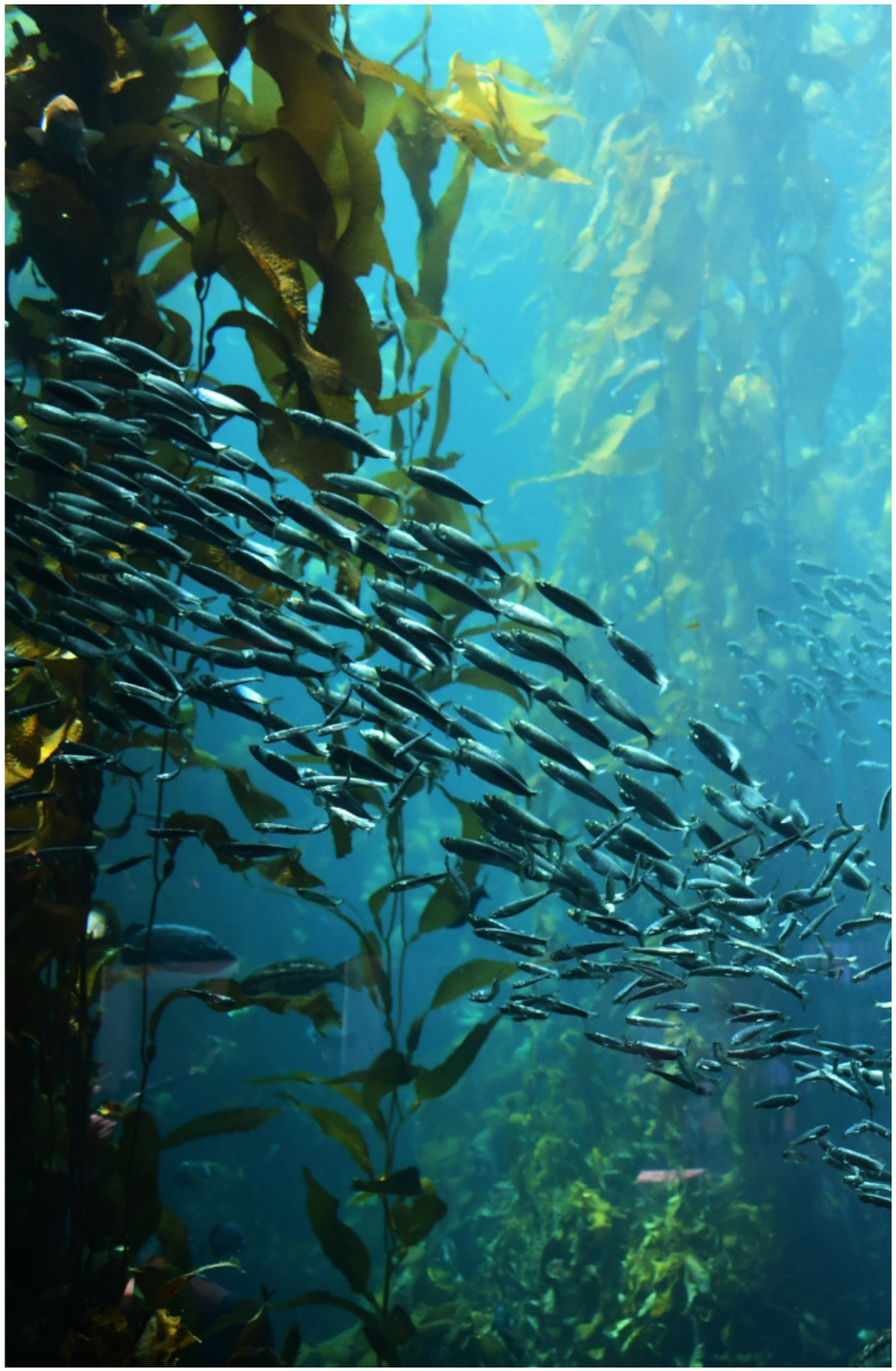
Example of renewed ambition:

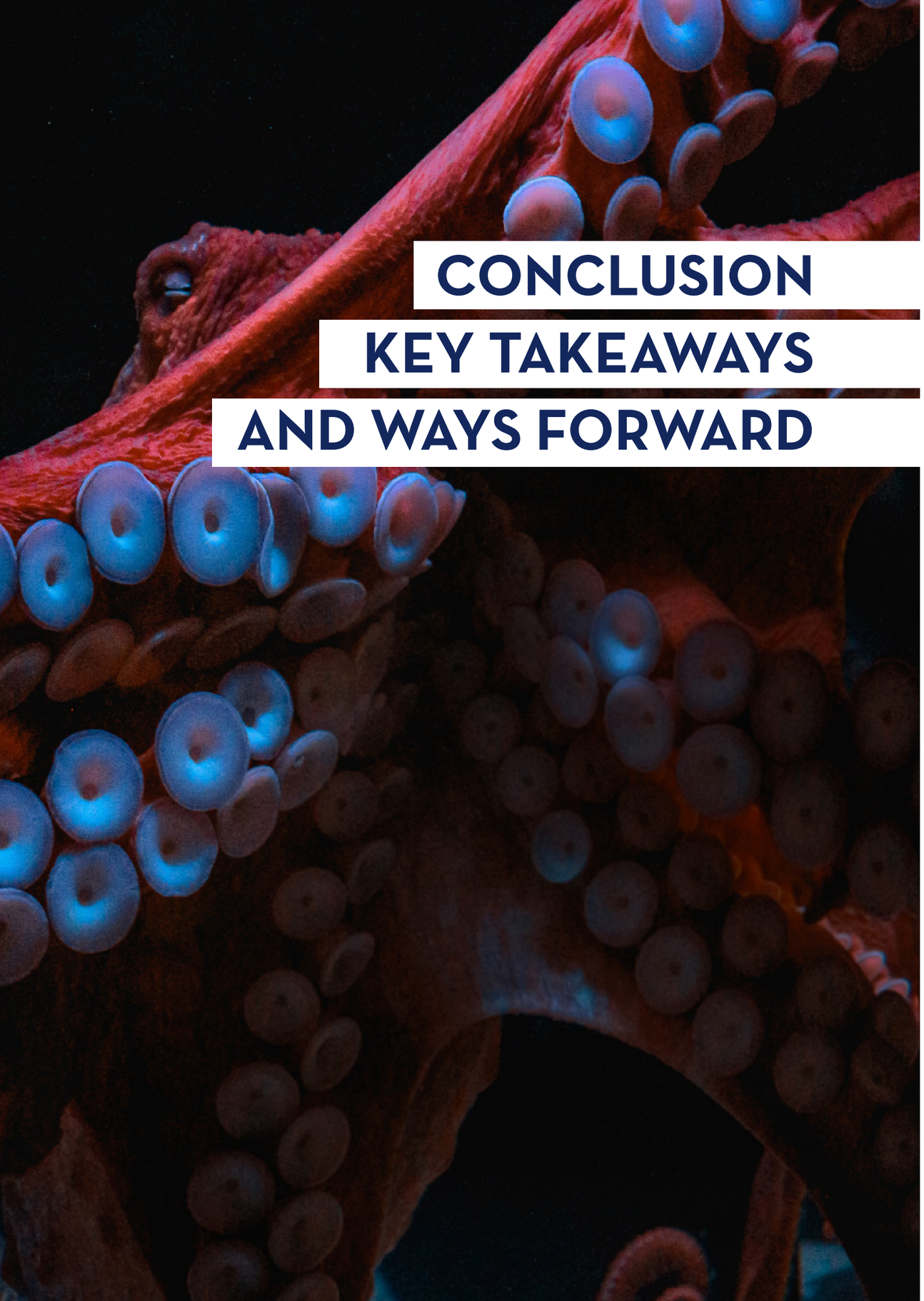
- In its first NDC, ***Gambia*** detailed the implementation of its Fisheries Strategy and Action Plan. This plan was identified "as one of the adaptation activities to address the adverse impacts of climate change on the sector and the national economy"[130]. It included measures such as the maximisation of yields through fish farming and the protection of fish landing sites and facilities from floodings. In its updated NDC, ***Gambia*** further promoted resilient fisheries' value chains and markets. It also committed to supporting the planning, rehabilitation and management of buffering coastal ecosystems to build the resilience of fisheries.

Example of decreased ambition:

- In its first NDC, ***Nigeria*** developed a strategy for freshwater resources, coastal water resources and fisheries. In line with this strategy, it committed to enhancing artisanal fisheries and encouraging sustainable aquaculture as adaptation options for fishing communities. In comparison, ***Nigeria*** did not include measures related to climate-resilience fisheries and aquaculture in its updated NDC.

128/ UNFCCC NDC Registry. Sao Tome and Principe's first NDC (p3)
129/ UNFCCC NDC Registry. Somalia's first NDC (p45)
130/ UNFCCC NDC Registry. Gambia's first NDC (p13)





CONCLUSION
KEY TAKEAWAYS
AND WAYS FORWARD

Coastal and marine ecosystems have significant carbon sequestration and storage capacity[131], and provide a wide range of benefits in helping coastal populations adapt to a changing climate.[132] The protection, restoration and conservation of these vital ecosystems represent an effective ocean-based climate solution to contribute to achieving emission reduction plans and building resilience in line with the Paris Agreement.

In that regard, coastal and marine NbS (i.e. actions to protect, sustainably manage and restore coastal and marine ecosystems in ways that address societal challenges effectively and adaptively) provide significant opportunities in terms of climate mitigation, adaptation and resilience, both for nature and people.[133] For instance, services provided by mangrove habitats to human livelihoods are estimated to be worth at least $USD 1.6 billion annually.[134]

The first revision cycle of NDCs offers a great opportunity for Parties to the Paris Agreement to update, assess and review their national climate commitments, as each successive NDC is required to showcase increased ambition relative to the previous submission (Article 4.3 of the Paris Agreement).[135] Therefore, this revision cycle also presents an opportunity for Parties to make greater use of coastal and marine NbS in their strategies and actions to effectively ratchet up ambition.

In a context of growing attention to the ocean in climate strategies, the present report takes a deep dive into new and updated NDCs, looking at the extent to which Parties to the Paris Agreement have included NbS in coastal and marine ecosystems as part of their mitigation and/or adaptation measures. In line with the ambition loop, this report further considers whether Parties have increased, renewed, unchanged or decreased their ambition with regards to the inclusion of NbS in coastal and marine ecosystems between first and updated NDCs. It will therefore contribute to the exercise of stocktaking (i.e. concluding at UNFCCC COP 28) to inform the second revision cycle of NDCs and support related national climate commitments.

Out of 148 countries that have submitted their new or updated NDCs, as of 1 October 2023, 97 countries have included coastal and marine NbS, with 61 countries including coastal and marine NbS for both mitigation and adaptation purposes, 1 for only mitigation, and 35 for only adaptation. Overall, this analysis suggests that countries identified coastal and marine NbS as multi-purpose solutions, with the potential to jointly achieve climate mitigation and adaptation objectives. The recognition of mitigation and adaptation co-benefits by 55 countries, as well as resultant socioeconomic benefits by 44 countries, further supports this conclusion.

Another trend emerging from these figures is that countries favour the integration of coastal and marine NbS for adaptation purposes, rather than for mitigation purposes, since 65% of all countries included coastal and marine NbS for adaptation, versus 42% for mitigation.

Regarding mitigation efforts, it is interesting to note that blue carbon ecosystems were clearly favoured since 61 countries included mangroves, seagrasses and salt marshes in their strategies, whereas only 9 countries have integrated other coastal ecosystems for mitigation purposes in their updated NDCs. This suggests that more in-depth understanding of the sequestration potential of other blue carbon ecosystems is needed to ensure adequate policy guidance building on sound scientific data is developed, while at the same time accounting windfalls are avoided. Indeed, strong ocean-based climate action should not be used as a substitute for rapidly phasing-out high emission activities on land and at sea.

For adaptation, most countries favoured measures to sustainably manage coastal zones and/or implement protected areas (MPAs and/or OECMs), with 91 countries committing to such measures (i.e. 62% of countries with coastal and marine NbS for adaptation). These are followed by coastal and marine ecosystem

131/ IPCC (2019)
132/ Ibid
133/ Narayan, S., et al. (2016)
134/ Magnan, A.K., et al. (2018)
135/ Fransen, T., et al. (2019)

protection and restoration (71 countries) and climate-ready fisheries and fishing communities (59 countries). The latter received less attention than the first two types of NbS, it may be inferred that countries generally focus their efforts on sustainably managing fish stocks rather than adapting fisheries to climate impacts - although, it is important to note that both actions go hand in hand.

Overall, figures from updated NDCs suggest that there is a greater recognition and appreciation of the role played by coastal and marine NbS in achieving climate objectives in line with the Paris Agreement, and the comparison to (I)NDCs or first NDCs only confirms this assumption. In first NDCs, 68 out of 142 countries[136] included coastal and marine NbS for mitigation and/or adaptation, versus 93 in updated NDCs (i.e. an increase of 37%).

Moreover, there is an overall increase in countries' level of ambition with regards to coastal and marine NbS for climate mitigation and adaptation.[137] More than half of the countries that submitted their updated NDCs have increased their ambition in comparison to their first NDCs. Out of 142 countries, 80 added new coastal and marine NbS for either mitigation or adaptation purposes between their two submissions.
This increase in ambition is clear in updated NDCs, where countries have further mentioned ocean vulnerabilities, i.e. further recognising ocean changes (e.g. acidification) and/or related climate impacts (e.g. sea-level rise).[138] In first NDCs, 83 countries had included references to such changes and impacts - versus 90 having done so in updated NDCs. Among the former 83 countries, 20 mentioned ocean vulnerabilities while not including coastal and marine NbS (e.g. Kuwait, Mauritania and Namibia). However, it is interesting to note that 16 out of the 20 countries built on these observations and included coastal and marine NbS in their updated NDCs.

In addition, this increase in ambition is evidenced by the new coastal and marine NbS included in the mitigation and/or adaptation measures reflected in updated NDCs. 80 countries have included coastal and marine NbS in their updated NDCs. Overall, countries have added more coastal and marine NbS in their adaptation measures (i.e. 73 countries) than in their mitigation measures (i.e. 42 countries), favouring the addition of new measures for adaptation rather than mitigation in updated NDCs.

It is worth noting that countries also added specific and quantifiable targets to support the implementation of these measures in their updated NDCs. Overall, 33 countries have increased their ambition, adding new quantitative targets to support the implementation of coastal and marine NbS for mitigation and/or adaptation (e.g. quantifying a percentage of coastal wetlands under protection). The growing number of countries adding carbon emission reduction targets in relation to coastal wetlands (e.g. mentioning LULUCF activities or including blue carbon ecosystems in GHG inventory) supports this conclusion.

Through conservation, restoration and sustainable management of coastal and marine ecosystems, countries have the opportunity to increase ambition towards achieving the Paris Agreement's long-term goals, while building resilience along their coastlines, and securing a future for coastal biodiversity, food security and livelihoods - thereby also meeting global sustainable development and biodiversity goals.

While an increasing number of countries are including coastal and marine NbS in their NDCs, countries have also recognised the challenges they face in implementing their commitments, for instance referring to the COVID-19 pandemic and resulting economic consequences. Further refinement of NDCs could help overcome such difficulties, ensuring that commitments are based on the ground, guided by robust science, and equitably implemented. NbS need to be developed with specific standards, criteria and measures to ensure high quality and integrity for long-term effectiveness and sustainability.[139] There are for instance viable opportunities for all 151 blue carbon countries to act and include coastal wetlands in their NDCs - even countries with limited technical knowledge of the ecosystems scale or carbon value - based on available guidelines and information.[140,141,142]

From the mitigation benefits of seagrass, to the coastal protection value of coral reefs, NbS are cost-effective solutions[143,144] that can be used as a lever to expand climate action, financing and policy. Additionally, NbS can play a major role in enhancing synergies among international fora, in particular between the UNFCCC and its sister convention - the CBD. Adopted at CBD COP 15 in December 2022, the Kunming-Montreal Global Biodiversity Framework (GBF) is indeed highly complementary to the climate regime. For instance, Target 8 of the GBF aims to "minimise the impact of climate change and ocean acidification on biodiversity and increase its resilience [...], including through nature-based solutions".[145] The GBF calls for the protection (Target 3), restoration (Target 2) and sustainable management (Targets 1 and 11) of ecosystems, including coastal and marine, which will prove critical for climate mitigation and adaptation. Moving to the implementation phase at the national level, countries are now required to update their National Biodiversity Strategies and Action Plans (NBSAPs) - the biodiversity counterpart of the NDCs - by CBD COP 16 in 2024. With the NBSAP and NDC being revised respectively in 2024 and 2025, there is a significant opportunity to align climate and biodiversity commitments at the national level through the integration of coastal and marine NbS in the next submissions.

In conclusion, this report shows that countries have further recognised the ability of coastal and marine NbS to contribute to mitigating and adapting to the impacts of climate change. While strong ocean-based climate action should not substitute drastic measures to reduce GHG emissions in other determinant sectors, these solutions offer numerous opportunities for countries to raise their ambition, and contribute to achieving the long-term goals of the Paris Agreement. The Paris Agreement indeed relies on the ambition mechanism, and the international political agenda provides multiple options to "ratchet up". In this perspective, the first Global Stocktake will provide a global checkpoint between the long-term goals of the Paris Agreement and the short-term climate actions and commitments presented in NDCs.[146,147] It will be an important step ahead of the second NDC revision cycle (2025) for countries to further include and strengthen their commitments to marine and coastal NbS in their national climate strategies.

Contact information:

For further information, please do not hesitate to contact:

Marine Lecerf, International Policy Officer, Ocean & Climate Platform: mlecerf@ocean-climate.org

136/ As of 1 October 2023, the comparative analysis covers the 141 countries and the EU-27, hereafter 142 countries, that have submitted both their first and updated NDCs (i.e., in total 168 countries).

137/ A country is considered to have increased its ambition when it added new coastal and marine NbS, i.e. when it included coastal and marine NbS as part of their mitigation and/or adaptation measures in updated NDCs, but did not include it in INDC or first NDC.

138/ Ocean-related vulnerabilities are defined in this report as the multiple pressures weighing on the ocean (e.g. ocean acidification, coral bleaching) and/or threats coming from ocean changes caused by climate impacts (e.g. sea-level rise, coastal erosion, marine species distribution changes).

139/ IUCN (2020)

140/ The Blue Carbon Initiative (2023). Guidelines for Blue Carbon and Nationally Determined Contributions.

141/ UNFCCC (2020). Scaling up adaptation actions and cooperation to build climate resilience of the ocean, coastal areas and ecosystems. Policy Brief. Nairobi Work Programme.

142/ Hamilton, J., et al (2023). Blue Carbon and NDCs Guidelines: Second Edition.

143/ Narayan, S., et al. (2016)

144/ Seddon, N., et al. (2020)

145/ CBD (2022). Decision 15/4.

146/ Schindler Murray, L., et al. (2021). Unpacking the UNFCCC Global Stocktake for Ocean-Climate Action. IUCN, Rare, Conservation International, WWF, and Ocean & Climate Platform.

147/ In accordance with Decision 19/CMA.1 on the Global Stocktake, adopted in 2018 at UNFCCC COP 24, the CMA requested the secretariat to prepare four synthesis reports for the technical assessment (available here). They respectively address: (1) mitigation and the state of GHG emissions, (2) adaptation, (3) progress in implementing Nationally Determined Contributions, and (4) means of implementation.

METHODOLOGY

Scope of the NDC analysis

The present report reviews the 148 new or updated NDCs (i.e. 147 countries and the EU-27), submitted between 29 March 2019 and 1 October 2023, as part of the first revision cycle.

While the Paris Agreement requires Parties to update their NDCs every five years (i.e. 2020, 2025, etc.), many NDC submissions were delayed for a few years, notably due to the COVID-19 pandemic which hit the world in 2020-2021. As a result, all NDCs submitted between 2020 and 2023 fall within the first revision cycle - regardless of the appellation given by each country (e.g. revised, updated, reviewed).

In addition, it is worth noting that some countries have already amended their updated NDCs - in response to the Glasgow Climate Pact, which called on all countries to strengthen the level of ambition of their NDCs by 2022. In this context, they published a revised or a complementary text (e.g. Australia, Republic of Korea, UAE, United Kingdom). Such amendments were taken into account in this publication, which can explain disparities between the different versions of this report (i.e. June 2021, October 2021, October 2023).

A three-step evaluation to assess the inclusion of coastal and marine NbS in new or updated NDCs

The objective of the present report is to summarise a quantitative and qualitative assessment of whether and how coastal and marine NbS (i.e. actions to protect, sustainably manage and restore coastal and marine ecosystems in ways that address societal and ecological challenges effectively and adaptively) have been integrated within new or updated NDCs as part of mitigation or adaptation measures. Coastal and marine NbS for mitigation cover the protection and restoration of (I.a) blue carbon ecosystems and (I.b) other coastal ecosystems. Besides, coastal and marine NbS for adaptation include (II.a) the protection and restoration of coastal and marine ecosystems; (II.b) coastal zone management and protected areas; and (II.c) climate-ready fisheries and fishing communities. Therefore, countries that included other ocean-based measures such as offshore renewable energy or emission reduction measures for shipping, without referring explicitly to the action types listed above, were not included in the analysis.

To that end, the analysis comprised a three-step process:

1 / In accordance with Gallo's (2017) quantitative marine focus factor[148], we carried out an initial word search composed of widely used coastal and marine vocabulary[149], in order to primarily identify all ocean-related NDCs - submitted on the UNFCCC NDC Interim Registry.

2 / With the identified list of ocean-inclusive NDCs, we furthered our analysis by applying a refined and more thorough wordsearch, exclusively related to coastal and marine NbS, in order to better assess the extent to which these solutions were integrated into the first cycle of NDCs. Since each Party uses its specific wording when referring to marine issues, the word search remained flexible to a certain degree, as long as the meaning of the text remained relevant to the purpose of this analysis.

3 / Building on the refined wordsearch, we empirically evaluated the main trends occurring in updated NDCs, in terms of coastal and marine NbS. Specifically, we conducted another thorough individual review of each NDC to better assess the context in which NbS wordings appeared into NDCs and how they were included and accounted for. This third review enabled us to define the categories of the analysis, by developing an assessment table to sort through the keywords and define a set of action types. Each defined action type includes one or several keyword(s). Additionally, we have compiled the specific quotes from all NDCs that have allowed for their inclusion in the analysis.

148/ Gallo, N., et al. (2017)

149/ Initial wordsearch: blue carbon, coastal, fisheries, marine, sea, ocean, wetlands, maritime.

As a result, the present report differentiates between references to the ocean and commitments to implement coastal and marine NbS as part of countries' climate strategy. Hence, the report further analyses how and to what extent coastal and marine NbS were included as measures (i.e. concrete action) to mitigate and/or adapt to the impacts of climate change. It also looks at whether these measures are complemented by quantitative targets aimed at reporting on and monitoring progress.

Countries that did not explicitly (i.e. according to the word search) commit to specific measures related to coastal and marine NbS were therefore not included in the analysis - which does not necessarily mean that countries do not have any measures and/or ambition in that regard. This includes coastal countries that included the IPCC 2013 Wetlands Supplement without including any coastal and marine NbS.

The analysis results are presented using the following qualifiers, which are applied to denote the percentage of the submitted NDCs that mention coastal and marine NbS: "a few" for less than 10%; "some" for 10-40%; "several" for 40-70%; "many" for 70-90%; and "most" for 90% and above.

A comparative analysis to assess countries' level of ambition with regard to coastal and marine NbS

The present report also includes a comparative analysis to track countries' progress in integrating coastal and marine NbS since 2015, by identifying their degree of ambition. First and updated NDCs were analysed using the same methodology and wordsearch for the sake of consistency and comparability. It is worth noting that while some countries clearly built their updated NDC on their first one, (e.g. mentioning their previous commitments and related advances), others did not refer to first NDCs in their updated one - which does not necessarily mean that they do not have ongoing efforts related to coastal and marine NbS.

Therefore, the comparative analysis is based on the inclusion of additional coastal and marine NbS in updated NDCs compared to first NDCs/(I) NDCs. A country's level of ambition was described as follows:

	Inclusion of coastal and marine NbS		Description
Level of ambition	First NDCs	Updated NDCs	
Increased (↑)	No	Yes	countries added new coastal and marine NbS in their updated NDCs
Renewed (+)	Yes	Yes	countries included coastal and marine NbS in their first and updated NDCs
Unchanged (-)	Yes	No	countries omitted coastal and marine NbS in their first and updated NDCs
Decreased (↓)	No	No	countries did not mention coastal and marine NbS in their updated NDCs, despite including coastal and marine NbS in their first NDC

Coastal countries with an unchanged level of ambition (i.e. that did not include coastal and marine NbS in both their first and updated submissions) have an untapped potential for future ambition. However, landlocked countries do not have the possibility to implement coastal and marine NbS. The latter countries were therefore addressed differently in the present report, e.g. highlighted in orange in tables.

To define the level of ambition, we drew a specific table to aggregate the data and classify countries under these four categories. Points were either allocated or deducted to countries, depending on whether they included or removed coastal and marine NbS for mitigation and/or adaptation between submissions.

It is important to stress that, among the 148 submissions, 6 countries (i.e. Brunei Darussalam*, Ecuador*, Holy See*, Philippines*, Senegal*, South Sudan*) - that are referred to as "new" NDCs and marked with an asterisk in the report - submitted their first NDCs between 29 March 2019 and 1 October 2023. Simply put, they only have one submission, and therefore could not be included in the comparative analysis. This explains why the comparative analysis covers 142 NDCs (i.e. 141 countries and the EU-27) - instead of 148.

RESOURCES

- Accelerating Climate Ambition and Impact: Toolkit for Mainstreaming Nature-Based Solutions into Nationally Determined Contributions
- Best Practice Guidelines for Mangrove Restoration
- Blue-Nature-Based Solutions in Nationally Determined Contributions, a Booklet for successful Implementation
- Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions
- Enhancing NDCs through Nature-Based Solutions: 8 simple recommendations for integrating nature into NDCs
- Guide to Including Nature in Nationally Determined Contributions: A Checklist of information and accounting approaches for natural climate solutions
- Guidelines for Blue Carbon and Nationally Determined Contributions (2023 Edition)
- Guidelines for Integrating Mangrove Ecosystems into NDCs with the Global Mangrove Watch
- International Guidelines On Natural And Nature-Based Features For Flood Risk Management
- International policy framework for blue carbon ecosystems: recommendations to align actions across international policy processes for the conservation and restoration of coastal blue carbon ecosystems
- IUCN Global Standard for Nature-based Solutions and associated Guidance for using the IUCN Global Standard for Nature-based Solutions
- Nature-based Solutions for Climate Resilience in Humanitarian Action
- Practical Guide to Implementing Green-Gray Infrastructure
- The Blue Carbon Handbook: Blue carbon as a nature-based solution for climate action and sustainable development
- The Nature Navigator: A handbook for disaster risk management practitioners

REFERENCES

Beasley, E. et al. (2019). Guide to Including Nature in Nationally Determined Contributions: A Checklist of information and accounting approaches for natural climate solutions. Available at: https://www.nature.org/content/dam/tnc/nature/en/documents/Guide_to_Including_Nature_in_NDCs.pdf

Because the Ocean (2016), Second Because the Ocean Declaration. Available at: https://www.becausetheocean.org/second-because-the-ocean-declaration/

Because the Ocean (2016). Second Because the Ocean Declaration. Available at: https://www.becausetheocean.org/second-because-the-ocean-declaration/

Because the Ocean (2019), Ocean for Climate: Ocean-Related Measures in Climate Strategies. Available at: https://www.becausetheocean.org/wp-content/uploads/2019/10/Ocean_for_Climate_Because_the_Ocean.pdf

Beck, M., & Menendez, P. (2020). Protecting mangroves can prevent billions of dollars in global flooding damage every year. Available at: https://theconversation.com/protecting-mangroves-can-prevent-billions-of-dollars-in-global-flooding-damage-every-year-132424

Bosma, R.H., et al. (2020). Associated Mangrove Aquaculture Farms; Building with Nature to restore eroding tropical muddy coasts. Ecoshape technical report, Dordrecht, The Netherlands. Available at: https://www.wetlands.org/publications/technical-guidelines-associated-mangrove-aquaculture-farms/

CBD (2022). Decision 15/4. Available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

Chausson, A., et al. (2020). Mapping the effectiveness of nature-based solutions for climate change adaptation. Global Change Biology. Volume 26, Issue 11. . Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.15310

Deprez, A. et al. (2021). Aligning high climate and biodiversity ambitions in 2021 and beyond: why, what, and how? IDDRI, Study N°05/21. Available at: https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Etude/202104-ST0521_EN.pdf.pdf

DESA. (2021). System of Environmental Economic Accounting (SEEA). Available at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf

Diz, D. et al. (2021). Blueprint for a Living Planet: Four Principles for Integrated Ocean-Climate Strategies. Available at: https://wwfint.awsassets.panda.org/downloads/blueprint_for_a_living_planet_final_june_2021_spreads.pdf

FAO (2021). Adaptive management of fisheries in response to climate change. FAO Fisheries and Aquaculture Technical Paper No.667. Available at: https://www.fao.org/fishery/en/publication/264957

FAO (2022). The State of World Fisheries and Aquaculture. https://www.fao.org/documents/card/en/c/cc0461en

Ferrario, F. et al. (2014). The effectiveness of coral reefs for coastal hazard risk reduction and adaptation. Nature communications. 5. 3794. 10.1038/ncomms4794. Available at: https://www.nature.com/articles/ncomms4794

Fransen, T., et al. (2019), Enhancing NDCs: A Guide to Strengthening National Climate Plans by 2020, Washington, DC: World Resources Institute. available at: https://www.wri.org/research/enhancing-ndcs-guide-strengthening-national-climate-plans

Gallo, N., Victor, D., & Levin, L. (2017). Ocean commitments under the Paris Agreement. Nature Climate Change. 7. nclimate3422. 10.1038/nclimate3422. Available at: https://escholarship.org/uc/item/5255342w

Herr, D., & Landis, E. (2016). Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Policy Report. Gland, Switzerland: IUCN and Washington, DC, USA: TNC. Available at: https://portals.iucn.org/library/sites/library/files/documents/Rep-2016-026-En.pdf

IPBES-IPCC. (2021). IPBES-IPCC Co-Sponsored Workshop Report on Biodiversity and Climate Change. Available at: https://www.ipbes.net/sites/default/files/2021-06/20210609_workshop_report_embargo_3pm_CEST_10_june_0.pdf

IPCC. (2014a). 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, Hiraishi T, Krug T, Tanabe K, Srivastava N, Baasansuren J, Fukuda M, and Troxler TG. (eds). Published: IPCC, Switzerland. Available at: https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/

IPCC (2014b). Fifth Assessment Report (AR5). p. 14. Available at: https://www.ipcc.ch/report/ar5/wg2/

IPCC (2019). Summary for Policymakers. In: Special Report on the Ocean and Cryosphere in a Changing Climate (H.-O.P rtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegr a, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. M. Weyer (eds.)). Available at: https://www.ipcc.ch/srocc/

IPCC (2021). Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. In Press. Available at: https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/

IUCN (2016). Defining Nature-based Solutions. WCC-2016-Res-069-EN. Available at: https://portals.iucn.org/library/sites/library/files/resrecfiles/WCC_2016_RES_069_EN.pdf

IUCN (2020). Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. Available at: https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf

Jacquemont, J., et al. (2022). Ocean conservation boosts climate change mitigation and adaptation. One Earth. Volume 5. Issue 10. Pages 1126-1138. October 21, 2022. Available at: https://ocean-climate.org/en/ocean-conservation-boosts-climate-change-mitigation-and-adaptation-a-recent-research-study-reveals/

Jouffray, J.-B., et al. (2020). The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. One Earth. Volume 2, Issue 1, 24 January 2020, Pages 43-54. Available at: https://www.sciencedirect.com/science/article/pii/S2590332219302751

Gattuso, J.-P., et al. (2018). Ocean Solutions to Address Climate Change and Its Effects on Marine Ecosystems. Front. Mar. Sci., 04 October 2018. Sec. Global Change and the Future Ocean. Volume 5. Available at: https://www.frontiersin.org/articles/10.3389/fmars.2018.00337/full

Leal, M. & Spalding, M. (2022). The State of the World's Mangroves 2022. Global Mangrove Alliance. Available at: https://www.mangrovealliance.org/wp-content/uploads/2022/09/The-State-of-the-Worlds-Mangroves-Report_2022.pdf

Liverman, D., & Mills -Novoa, M. (2019). Nationally Determined Contributions: Material climate commitments and discursive positioning in the NDCs. Available at: https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wcc.589

Magnan, A.K. et al. (2018). Ocean-based measures for climate action. IDDRI, Policy Report N°06/18. Available at: https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Propositions/201810-PB0618-oceans%20solutions_0.pdf

Narayan, S. et al. (2016). The Effectiveness, Costs and Coastal Protection Benefits of Natural and Nature-Based Defences. PLoS ONE 11(5): e0154735. https://doi.org/10.1371/journal.pone.0154735

Nichols, C., Zinnert, J., Young, D., (2019). Degradation of Coastal Ecosystems: Causes, Impacts and Mitigation Efforts. In: Tomorrow's Coasts: Complex and Impermanent. Pages.119-136. Available at: https://www.researchgate.net/publication/325806922_Degradation_of_Coastal_Ecosystems_Causes_Impacts_and_Mitigation_Efforts

Northrop, E., et al. (2020). Enhancing Nationally Determined Contributions: Opportunities for OceanBased Climate Action Working Paper.

Washington, DC: World Resources Institute. Available at: https://www.wri.org/research/enhancing-nationally-determined-contributions-opportunities-ocean-based-climate-action

OCEAN AND CLIMATE (2015). Ecosystem Services and Marine Conservation, Ocean and Climate Platform. Available at: https://ocean-climate.org/wp-content/uploads/2017/03/ecosystem-marine-services_07-11.pdf

OCEAN AND CLIMATE (2019a), Scientific Fact Sheets, Ocean and Climate Platform,p.1-130, Available at: https://ocean-climate.org/wp-content/uploads/2020/01/200114_FichesScientifiques_EN_ppp.pdf

OCEAN AND CLIMATE (2019b). Policy Recommendations: A healthy ocean, a protected climate. Available at: https://ocean-climate.org/en/policy-recommendations-a-healthy-ocean-a-protected-climate/

Pickering, J., Pauw, P., Bhasin, S., Castro, P., (2019). Conditions (and risks) attached: unpacking developing countries' conditional contributions to the Paris Agreement. Available at: https://reliefweb.int/report/world/conditions-and-risks-attached-unpacking-developing-countries-conditional-contributions

Picourt, L., et al. (2021), Swimming the talk: How to strengthen collaboration and synergies between the Climate and Biodiversity Conventions?, Policy brief, May 2021, OCEAN & CLIMATE PLATFORM, p.1-14. Available at: https://ocean-climate.org/wp-content/uploads/2021/05/Policy-brief_CBD_UNFCCC-VF.pdf

Scarano, F., (2017). Ecosystem-based adaptation to climate change: concept, scalability and a role for conservation science. Perspectives in Ecology and Conservation, Volume 15, Issue 2. Pages 65-73. Available at: https://www.sciencedirect.com/science/article/pii/S1679007316301621

Schindler Murray, L., Romero, V. and Herr, D. (2021). Unpacking the UNFCCC Global Stocktake for Ocean-Climate Action. IUCN, Rare, Conservation International, WWF, and Ocean & Climate Platform. Available at: https://www.iucn.org/news/marine-and-polar/202105/ocean-and-unfccc-global-stocktake-what-does-mean

Seddon N, et al. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. Phil. Trans. R. Soc. B 375: 20190120. Available at: https://royalsocietypublishing.org/doi/pdf/10.1098/rstb.2019.0120

Solan M, et al. (2020). Benthic-based contributions to climate change mitigation and adaptation. Phil. Trans. R. Soc. B 375: 20190107. Available at: http://dx.doi.org/10.1098/rstb.2019.010

Sumaila, UR et al. (2021). Financing a sustainable ocean economy. Nature Comms 2021. Available at: https://www.nature.com/articles/s41467-021-23168-y.pdf

Taillardat et al., (2018). Mangrove blue carbon strategies for climate change mitigation are most effective at the national scale, Biol. Lett. 14: 20180251. Available at: https://royalsocietypublishing.org/doi/10.1098/rsbl.2018.0251

Taillardat P. et al. (2020). Climate change mitigation potential of wetlands and the cost-effectiveness of their restorationInterface Focus.102019012920190129 Available at: http://doi.org/10.1098/rsfs.2019.0129

The Blue Carbon Initiative (2023a). Guidelines for Blue Carbon and Nationally Determined Contributions. Available at: https://www.thebluecarboninitiative.org/policy-guidance

The Blue Carbon Initiative (2023b). Mitigating Climate Change through Coastal Conservation. Available at: https://www.thebluecarboninitiative.org/

The Nature Conservancy (2020a). The carbon sequestration power of coastal wetlands, Mapping Ocean Wealth, available at: https://oceanwealth.org/ecosystem-services/carbon/

The Nature Conservancy (2020b). Practical Implications of the Katowice Climate Package for Developing Country Parties and Land Sector Reporting. Available at: https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_Transparency_LandUseReport.pdf

Thiele, T., & Epps, M., (2022). Saving the ocean and climate through innovative marine protected area finance mechanisms, Gland, Switzerland, IUCN Headquarters: IUCN. 8 pages. Available at: https://www.iucn.org/resources/grey-literature/saving-ocean-and-climate-through-innovative-marine-protected-area-finance

Thiele, T, et al. (2020). Blue Infrastructure Finance: A new approach. integrating Nature-based Solutions for coastal resilience. Available at: https://www.conservation.org/docs/default-source/publication-pdfs/blue-infrastructure-finance.pdf?Status=Master&sfvrsn=6ed0bda1_2

Thomson, A., et al. (2020). Updated quantification of the impact of future land use scenarios to 2050 and beyond- Final report. UK Centre for Ecology and Hydrology. Pages 1-76. Available at: https://www.theccc.org.uk/publication/updated-quantification-of-the-impact-of-future-land-use-scenarios-to-2050-and-beyond-uk-centre-for-ecology-and-hydrology/

Tokunaga, K., et al. (2021). Ocean Risks in SIDS and LDCS. ORRAA. Stockholm Resilience Center. Global Resilience Partnership. Pages1-32. Available at: https://oceanrisk.earth/wp-content/uploads/2022/12/ORRAA-Ocean-Risks.pdf

UNDP (2017). A guide to transparency under the UNFCCC and the Paris Agreement. Reporting and review: obligations and opportunities. Available at: https://www.adaptation-undp.org/sites/default/files/resources/10190iied.pdf

UNDP (2020). Climate Promise Quality Assurance Checklist. For Revising Nationally Determined Contributions, Available at: https://www.ndcs.undp.org/content/ndc-support-programme/en/home/impact-and-learning/library/climate-promise-quality-assurance-checklist.html#:~:text=The%20quality%20assurance%20checklist%20is,Nationally%20Determined%20Contributions%20(NDCs).&text=This%20checklist%20outlines%20three%20dimensions,for%20ambitious%20and%20robust%20NDCs.

UNEP (2021). State of Finance for Nature 2021. Nairobi. Available at: https://www.unep.org/resources/state-finance-nature-2021

UNEP (2022). Emissions Gap Report. United Nations Environment Programme, Nairobi. Available at: https://www.unep.org/resources/emissions-gap-report-2022

UNFCCC (2021). Nationally determined contributions under the Paris Agreement. Addendum to the Synthesis report by the secretariat. UNFCCC. / PA/CMA/2021/2/Add.2. Available at: https://unfccc.int/sites/default/files/resource/cma2021_02a02.pdf

UNFCCC (2021). Interim NDC Registry. Available at: https://www4.unfccc.int/sites/NDCStaging/Pages/Home.aspx

UNFCCC (2023). NDC Registry. Available at: https://unfccc.int/NDCREG

UNFCCC. (2015). Report of the Conference of the Parties on its twentieth session, held in Lima from 1 to 14 December 2014. Available at: https://unfccc.int/sites/default/files/resource/docs/2014/cop20/eng/10a01.pdf

United Nations Human Settlements Programme. (2011). Global report on human settlement. Cities and Climate Change. Table 1.2. Available at: https://unhabitat.org/global-report-on-human-settlements-2011-cities-and-climate-change

Von Unger, Moritz; Herr, Dorothée; Seneviratne, Thilanka; Castillo, Gabriela (2020): Blue NbS in NDCs. A booklet for successful implementation (GIZ 2020). available at: https://ndcpartnership.org/toolbox/blue-nature-based-solutions-nationally-determined-contributions-0

Wabnitz, C., et al. (2021). Gender Dimensions of Ocean Risk and Resilience in SIDS and Coastal LDCS. ORRAA. Stockholm Resilience Center. Global Resilience Partnership. Pages 1-44. Available at: https://oceanrisk.earth/wp-content/uploads/2022/12/ORRAA-Gender-and-ocean-risk.pdf

World Resources Institute (2021). 4 Ocean-based Solutions to Advance Climate Action Through NDCs. Available at: https://www.wri.org/insights/4-ocean-based-solutions-advance-climate-action-through-ndcs