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Ocean-based Climate Action and Human Rights Implications under the International Climate Change Regime

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Abstract

After drawing attention to the crucial role of marine biodiversity, including that of deep-sea ecosystems, in current scientific understanding of the ocean-climate nexus, this article highlights the limited extent to which the international climate change regime has so far addressed the ocean. The focus then shifts to how the international climate change regime could contribute to the protection of marine biodiversity as part of mitigation, adaptation and finance, taking into account human rights impacts and standards, drawing a comparison with REDD+. The article concludes with an original proposal, inspired by the Climate and Clean Air Coalition, to develop urgent,

synergistic approaches to ocean- and human rights-based climate action through a multi-actor coalition, including different international treaties and United Nations bodies, to 'protect and restore the ocean's contributions to climate regulation, human well-being and planetary health'.

Keywords

ocean-climate nexus – international climate change regime – biodiversity – human rights – finance

Introduction

The ocean and its biodiversity play a key role in regulating the global climate and slowing climate change by absorption of excess heat, carbon dioxide (CO_2) and other greenhouse gases from the atmosphere.[1] This is the so-called 'ocean-climate nexus'. The ocean has absorbed 90 per cent of the warming that has occurred since 1955 due to increasing greenhouse gas emissions; the top few metres of the ocean store as much heat as the Earth's entire atmosphere.[2] For example, if the lower 10 kilometres of the atmosphere were to have taken up the same amount of heat as the ocean from 1971–2010, the atmosphere would have warmed by 36°C.[3]

Protecting and restoring ocean habitats is estimated to have the potential to sequester carbon dioxide from the atmosphere at rates up to four times higher than terrestrial forests can. In addition, offshore wind energy holds crucial

1 All of the authors of this article, except for Kati Kulovesi, Ellycia Harrould-Kolieb and Eugenia Recio Piva, are members of the UKRI GCRF One Ocean Hub. This article draws from research undertaken by these authors under the One Ocean Hub, which is a collaborative research programme for sustainable development funded by United Kingdom Research and Innovation (UKRI) through the Global Challenges Research Fund (GCRF) (Grant Ref: NE/S008950/1). All of the authors would like to thank Professors David Freestone and Michael Mehling for their helpful comments and useful feedback on earlier versions of this article.

2 NASA, Global Climate Change, 'Vital signs of the planet: Ocean warming' available at https://climate.nasa.gov/vital-signs/ocean-warming/. All websites accessed on 30 June 2023, unless otherwise mentioned.

3 F Whitmarsh, J Zika and A Czaja, 'Ocean heat uptake and the global surface temperature record' (*Grantham Institute Briefing Paper No. 14*, Grantham Institute, London, 2015) 2, available at https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Ocean-heat-uptake---Grantham-BP-15.pdf.

potential to replace fossil fuel-based energy generation.[4] Yet the potential of the ocean and marine ecosystems to achieve the international climate goals are still largely overlooked in intergovernmental climate negotiations.

Meanwhile, climate change has increasingly negative impacts on the ocean, which is warming, rising, acidifying and losing oxygen.[5] In addition, there are more frequent and intense extreme weather events as well as marine heatwaves, which are predicted to further increase into the future, causing a plethora of biological and socioeconomic impacts.[6] Indeed, under the Convention on Biological Diversity (CBD),[7] 196 Parties have recognised since 2008 that climate change is a major driver of biodiversity loss,[8] but also that climate change response measures can have negative impacts on biodiversity and on the human rights of Indigenous peoples and local communities.[9] A new global target has thus been set under the CBD to 'minimise the impacts of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions … through nature-based solutions and/or ecosystem-based approaches, while minimising negative and fostering positive impacts of climate action on biodiversity' by 2030'.[10]

The UN Human Rights Committee, in 2022,[11] recognised the negative impacts of climate change on ocean-dependent livelihoods and cultures, including the ability to transmit to children and future generations traditions related to the

4 JS Jones, 'To solve climate change, remember the ocean' *Nature World View* (19 September 2019) available at https://doi.org/10.1038/d41586-019-02832-w.

5 Intergovernmental Panel on Climate Change (IPCC), *Special Report on the Ocean and Cryosphere in a Changing Climate* [H-O Pörtner *et al.* (eds)] (Cambridge University Press, Cambridge, 2022) available at https://www.ipcc.ch/srocc/ [SROCC Report]; see also United Nations Climate Change, 'Ocean action under the UNFCCC' available at https://unfccc.int/topics/ocean/ocean-action-under-the-unfccc.

6 KE Smith *et al.*, 'Biological impacts of marine heatwaves' (2023) 15 *Annual Reviews in Marine Science* 119–145.

7 Convention on Biological Diversity (Rio De Janeiro, 5 June 1992, in force 29 December 1993) 1760 *UNTS* 79 [CBD].

8 CBD Conference of the Parties (COP) 7, Decision VII/15, Biodiversity and climate change, UN Doc UNEP/CBD/COP/DEC/VII/15 (13 April 2004), paras 8, 13, 15.

9 CBD COP9, Decision IX/16, Biodiversity and climate change, UN Doc UNEP/CBD/COP/DEC/IX/16 (9 October 2008), para 1; E Morgera, 'No need to reinvent the wheel for a human rights-based approach to tackling climate change: The contribution of international biodiversity law' in EJ Hollo, K Kulovesi and M Mehling (eds), *Climate Change and the Law* (Springer, Dordrecht, 2013) 350–390.

10 CBD COP15, Decision XV/4, Kunming-Montreal Global Biodiversity Framework, UN Doc CBD/COP/DEC/15/4 (19 December 2022), Target 8.

11 Human Rights Committee (HRC), *Daniel Billy and others* v. *Australia*, 22 September 2022, UN Doc CCPR/C/135/D/3624/2019 [*Torres Strait Islands*].

sea. This is particularly the case when marine resources are essential components of distinctive ways of life and when alternatives to subsistence livelihoods are lacking, such as on small islands.[12] The lack, delay or inadequacy of ocean-based climate change adaptation is considered a violation of human rights when the ability of human rights-holders to cope is compromised, and negative impacts on their human rights are foreseeable, serious and attributable to State authorities.[13] This understanding of State obligations[14] is also rapidly surfacing elsewhere.[15]

International legal scholarship to date has focused heavily on the existential threats arising from sea level rise,[16] on climate migrants,[17] and there is ever-growing legal scholarship on ocean acidification[18] and the law of the sea and climate change.[19] There is, however, a much broader array of negative impacts on the marine environment arising from climate change that deserves reflection on from an international law perspective.[20] This is notably the case

12 *Ibid.*, paras 8.6–8.10; see also E Hau'ofa, 'The ocean in us' (1998) 10(2) *The Contemporary Pacific* 391–410.

13 *Torres Strait Islands* (n 11), para 8.12.

14 See also HRC, *Teitiota* v. *New Zealand*, 7 January 2020, UN Doc CCPR/C/127/D/2728/2016.

15 European Court of Human Rights (ECtHR), *Duarte Agostinho and Others* v. *Portugal and Others*, App. no. 39371/20, 13 November 2020; ECtHR, *KlimaSeniorinnen and Others* v. *Switzerland*, App. no. 53600/20, 17 March 2021; ECtHR, *Carême* v. *France*, App. no. 7189/21, 28 January 2021; in the United States, *Juliana et al.* v. *United States of America et al.*, U.S. Dist. LEXIS 156014 (2015); in Canada, *Mathur* v. *His Majesty the King in Right of Ontario*, ONSC 2316 (2023); in Australia, *Minister for the Environment* v. *Sharma*, FCAFC 35 (2022).

16 See, for example, the works by the International Law Commission on sea level rise in relation to international law, available at https://legal.un.org/ilc/guide/8_9.shtml, and the International Law Association, available at https://www.ila-hq.org/en_GB/committees/international-law-and-sea-level-rise; see also D Vidas and D Freestone 'Legal certainty and stability in the face of sea level rise: The development of State practice and international law scholarship on maritime limits and boundaries' (2022) 37(4) *International Journal of Marine and Coastal Law* (*IJMCL*) 673–725, doi:10.1163/15718085-bja10106.

17 For example, J McAdam, *Climate Change, Forced Migration and International Law* (Oxford University Press, Oxford, 2012) 186–211.

18 See DL VanderZwaag, N Oral and T Stephens (eds), *Research Handbook on Ocean Acidification Law and Policy* (Edward Elgar, Cheltenham, 2021).

19 See, for example, E Johansen, SV Busch and IU Jakobsen (eds), *The Law of the Sea and Climate Change* (Cambridge University Press, Cambridge, 2021); M McCreath and AR Maggio (eds), 'Special Issue: Climate Change and the LOSC' (2019) 34(3) *IJMCL* 385–536; A Boyle, 'Law of the sea perspectives on climate change' (2012) 27(4) *IJMCL* 831–838; C Redgwell, 'Treaty evolution, adaptation and change: Is the LOSC "enough" to address climate change impacts on the marine environment' (2019) 34(3) *IJMCL* 440–457; A Boyle, 'Litigating climate change under Part XII of the LOSC' (2019) 34(3) *IJMCL* 458–481.

20 See generally, H Lee *et al.*, *Synthesis Report of the IPCC Sixth Assessment Report* (*AR6*) (Cambridge University Press, Cambridge, 2023) 73–74; NL Bindoff *et al.*, 'Chapter 5:

for the full range of marine ecosystem services that are negatively impacted by climate change (food and water supply, renewable energy, benefits for health and well-being, cultural values, tourism, trade, and transport) and on which various dimensions of human well-being,[21] which are protected as international human rights, are dependent.[22] Marine ecosystem services are not yet fully understood[23] because of the uncertainty related to the environmental conditions of pelagic (open ocean) and deep-sea ecosystems, but there is sufficient knowledge to avoid 'foreseeable negative impacts on human rights' that can arise from decisions that may negatively affect marine biodiversity.[24]

In this article, we draw on biodiversity and fisheries science to complement the scientific understanding synthesised in the Intergovernmental Panel on Climate Change (IPCC) landmark *Special Report on Oceans and the Cryosphere* published in 2019,[25] to expand the understanding of the ocean-climate nexus, including deep-sea ecosystems in addition to coastal marine ecosystems, on which so far international human rights bodies have focused. Against this background, we explore to what extent ocean-based climate action could contribute to the achievement of the goals of the international climate change regime, and to what extent the regime could contribute to the protection of marine biodiversity, thereby preventing diffuse negative impacts on the human rights of ocean-dependent communities and everyone's human right to a healthy environment.[26]

Changing Ocean, Marine Ecosystems and Dependent Communities' in SROCC Report (n 5), at pp. 447–587.

21 IPCC, 'Summary for Policy Makers' in SROCC Report (n 5), at p. 5; see E Morgera, 'The ecosystem approach and the precautionary principle' in E Morgera and J Razzaque (eds), *Encyclopedia of Environmental Law: Biodiversity and Nature Protection Law* (Edward Elgar, Cheltenham, 2017) 70–80.

22 Human Rights Council (HRC), *Report of the Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment*, UN Doc A/HRC/34/49 (19 January 2017).

23 C Liquete *et al.*, 'Current status and future prospects for the assessment of marine and coastal ecosystem services: A systematic review' (2013) 8(7) *PLos One* e67737.

24 HRC (n 22), para 34.

25 Bindoff *et al.* (n 20), at p. 447; see also SROCC Report, Summary for Policymakers (n 21).

26 United Nations General Assembly (UNGA) Res 76/300 (1 August 2022), The Human Right to a Clean, Healthy and Sustainable Environment, UN Doc A/RES/76/300; see also pre-existing treaty bases, the evolving interpretation of which has been summarised in the Framework Principles on Human Rights and the Environment, in HRC, *Report of the Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment*, UN Doc A/HRC/37/59 (24 January 2018) [Framework Principles].

We thus do not focus on redress, and for that reason we do not engage in this article with the burgeoning literature on loss and damage,[27] or climate change litigation,[28] while acknowledging that further anthropogenic climate change is already irreversibly set in motion and will produce significant human rights impacts. We rather focus on the need for more synergistic, *preventive and precautionary* approaches to the interdependencies of climate change mitigation and adaptation, and the protection of marine biodiversity and human rights, in the face of the continued failure to reverse current biodiversity loss trends and their knock-on effects on the realisation of the majority of the Sustainable Development Goals (SDGs).[29]

The scene is set by reviewing the current state of knowledge on marine ecosystems and their benefits to human well-being and climate change, with a focus on blue carbon, considering its growing international attention. Then the opportunities for strengthening action related to the ocean-climate nexus in the international climate change regime are assessed, reflecting on concerns about climate change responses that do not take sufficient account of biodiversity and human rights. Considering the widely shared hopes across the international communities that climate finance can plug the gaping hole of resources devoted to SDG 14 (Life below water),[30] the focus shifts to institutional preconditions at the multilateral level for channelling climate finance into inclusive and sustainable ocean-based climate actions.[31] To that end, lessons are drawn from ongoing efforts under the international climate change regime related to addressing deforestation and climate change. The motivation is to explore experiences from creating innovative funding mechanisms for nature-based solutions under the international climate change regime.

27 For example, KE McNamara, 'Exploring loss and damage at the international climate change talks' (2014) 5(3) *International Journal of Disaster Risk Science* 242–246; P Toussaint, 'Loss and damage and climate litigation: The case for greater interlinkage' (2021) 30(1) *Review of European, Comparative & International Environmental Law* 16–33.

28 For example, K Mckenzie, 'Due diligence: The lay of the land from an ocean-climate perspective' (2023) 17(1) *Carbon and Climate Law Review* 35–55.

29 ES Brondízio *et al.* (eds), *The Global Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Secretariat, Bonn, 2019) 125, 391, 445.

30 P Scotland, 'Why we need to tackle the ocean funding crisis' (*Economist Impact*, 24 February 2022) available at https://ocean.economist.com/blue-finance/articles/why-we-need-to-tackle-the-ocean-funding-crisis.

31 This article, therefore, does not engage in depth with the substantive literature on climate finance. See, for instance, M Bowman, 'Polaris and pluralism: Presenting a legal analytical framework for climate finance' (2023) 17(1) *Carbon and Climate Law Review* 3–25.

The article concludes with an original proposal to develop an alternative, partnership-based governance arrangement that can influence the international climate regime through coordinated action taken across the UN System on ocean, human rights-based climate action.

Climate-related Marine Ecosystem Services and Their Relevance for the LOSC

This section reflects on climate-ocean science and its relationship with international law, based on the need for mutually supportive interpretation of relevant treaties, for the State Parties to the United Nations Convention on the Law of the Sea (LOSC),[32] the CBD, the Paris Agreement,[33] and international human rights.[34] This section emphasises the role of marine biodiversity in allowing the ocean to act as both a carbon sink and a heat sink. The role of climate-related marine ecosystem services (or ecosystem's benefits to people)[35] is emphasised, as well as other critical benefits to humanity, including from the deep sea, with a focus on 'blue carbon,' which has received growing attention in scientific research.[36] Importantly, blue carbon has recently entered the UN climate policy discussion under the concepts of 'ocean-based action' and 'nature-based solutions' to the impacts of climate change.[37]

32 United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982, in force 16 November 1994) 1833 *UNTS* 396 [LOSC].

33 Paris Agreement to the UNFCCC (Paris, 12 December 2015, in force 4 November 2016) 55 *ILM* 740 [Paris Agreement].

34 E Morgera and M Lennan, 'Ensuring Mutual Supportiveness of the Paris Agreement with other Multilateral Environmental Agreements: A Focus on Ocean-Based Climate Action' in A Zahar (ed), *Research Handbook on the Law of the Paris Agreement* (Edward Elgar, Cheltenham, 2023 forthcoming); available on www.ssrn.com; see also L Baars, 'The Salience of Salt Water: An ITLOS Advisory Opinion at the Ocean-Climate Nexus' (2023) 38(3) *IJMCL*, this issue.

35 Note the shift of focus by IPBES, from ecosystem services to 'nature's contributions to people', to acknowledge culture and Indigenous and local knowledge as pivotal in appreciating and understanding human-nature interactions. See S Díaz *et al.*, 'Assessing nature's contributions to people' (2018) 359(6373) *Science* 270–272; R Hill *et al.*, 'Nature's contributions to people: Weaving plural perspectives' (2021) 4(7) *One Earth* 910–915.

36 UNGA Res 72/73 (5 December 2017), Oceans and the Law of the Sea, UN Doc A/RES/72/73, para 197; S Lutz, 'Why protect ocean biodiversity' (Policy Lates 2021, Royal Society of Biology) available at https://www.youtube.com/watch?v=aZG5butO7CM&t=3s.

37 For example, United Nations Framework Convention on Climate Change (UNFCCC), 'Decision 1/CP.27 Sharm el-Sheikh Implementation Plan' in *Report of the Conference of the Parties on its Twenty-seventh Session, held in Sharm el-Sheikh from 6 to 20 November 2022*, UN Doc FCCC/CP/2022/10/Add.1 (17 March 2023).

The ocean is both a heat and carbon sink. In terms of heat energy sequestration, the ocean is able to take up and retain heat at over 1,000 times greater than the atmosphere.[38] The top layer of the ocean holds more heat than the Earth's atmosphere.[39] Of the additional heat created by anthropogenic climate change since 1950, 91 per cent has been absorbed by the ocean.[40] While this latent heat absorption has mitigated some of the worst effects of global climate change, there are limitations to the ocean's carrying capacity to store excess heat from global warming. This is causing a rapid rise in global ocean temperatures, though recent studies using improved methodologies indicate that the ocean is warming faster than previously estimated.[41] The IPCC confirmed that since 1993, the average rate of ocean warming has more than doubled.[42] Against this background, international legal scholars generally agree that, considering that the definition of marine pollution under the LOSC[43] encompasses both 'substances' and 'energy',[44] the addition of excess heat into the ocean from the atmosphere as a consequence of climate change constitutes pollution of the marine environment and therefore should be prevented by States through the reduction of GHG emissions.[45]

Also central to climate regulation is the role of the ocean in sequestering and storing CO_2 from the atmosphere.[46] It is noteworthy that it is both the physical ocean as a body of water *and* its biodiversity that play vital roles in the regulation of the climate. The ocean is a sink for approximately a quarter of anthropogenic CO_2, with dissolved organic carbon equating to approximately

38 IPCC, *Climate Change 2013: The Physical Science Basis: Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [T Stocker *et al.* (eds)] (Cambridge University Press, Cambridge, 2013) 260–263, available at https://www.ipcc.ch/report/ar5/wg1/.

39 NASA (n 2).

40 IPCC, *Climate Change 2013* (n 38), at p. 260; see also B Fox-Kemper, HT Hewitt and C Xiao, 'Ocean, cryosphere and sea level change' in IPCC, *Climate Change 2021: The Physical Science Basis: Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [V Masson-Delmotte *et al.* (eds)] (Cambridge University Press, Cambridge, 2021) 1211–1361, at p. 1228.

41 L Cheng *et al.*, 'How fast are the oceans warming?' (2019) 363(6423) *Science* 128–129.

42 SROCC Report, Summary for Policy Makers (n 21), at p. 8; IPCC, *Climate Change 2013* (n 38), at p. 1228.

43 LOSC (n 32); see sources cited in (n 19).

44 *Ibid.*, Article 1(4).

45 For example, Boyle (n 19).

46 AR Thurber *et al.*, 'Ecosystem function and services provided by the deep sea' (2014) 11(14) *Biogeosciences* 3941–3963.

200 times that of marine biomass,[47] and phytoplankton responsible for approximately 50 percent of global primary production of organic matter.[48] The biophysical process for this involves atmospheric CO_2 dissolving across the sea surface water, so as atmospheric concentrations increase, more CO_2 passes into the ocean. CO_2 is removed from the surface by physical means (e.g., mixing and downwelling) and, crucially, by phytoplankton. Through photosynthesis, phytoplankton fix dissolved CO_2 and export it to deeper water as they decompose and sink, or are consumed by herbivorous zooplankton. The larger zooplankton and their faecal pellets can be re-ingested by other organisms, working their way along the marine food web,[49] and ultimately sink out of the upper layers of the ocean to be broken down by microbes.[50] Thus LOSC obligations to adopt measures to prevent, reduce and control marine pollution protect and preserve rare or fragile ecosystems, as well as the habitat of depleted, threatened or endangered species and other forms of marine life,[51] are also relevant at the ocean-climate nexus.

As for the deep sea,[52] carbon stored in bottom waters or sediments is considered to be removed from the atmosphere for millions of years.[53] The IPCC reports provide estimates of carbon sequestered that range from 0.4–1.6 gigatonnes of carbon per year,[54] with the annual burial rate (permanent removal to sediment) being around 0.2 gigatonnes per year.[55] But insufficient scientific

47 AZ Worden *et al.*, 'Rethinking the marine carbon cycle: Factoring in the multifarious lifestyles of microbes' (2015) 347(6223) *Science* 735–746.

48 DKA Barnes *et al.*, 'Icebergs, sea ice, blue carbon and Antarctic climate feedbacks' (2018) 376 *Philosophical Transactions of the Royal Society A* 2017.0176; N Hilmi *et al.*, 'The role of blue carbon in climate change mitigation and carbon stock conservation' (2021) 3 *Frontiers in Climate* 710546.

49 HW Ducklow *et al.*, 'Upper ocean carbon export and the biological pump' (2001) 14(4) *Oceanography* 50–58.

50 GJ Herndl and T Reinthaler, 'Microbial control of the dark end of the biological pump' (2013) 6(9) *Nature Geoscience* 718–724.

51 LOSC (n 32), Article 194(5).

52 Deep seas are both benthic and pelagic systems deeper than 200 metres, so they overlap in great part with the high seas and the deep seabed that comprise the areas beyond national jurisdiction under LOSC (n 32). That said, some areas of the deep sea lie within national jurisdiction. See Synchronicity Earth, 'High and deep seas' (Synchronicity Earth Insight, 2018) available at https://www.synchronicityearth.org/wp-content/uploads/2018/02/Synchronicity-Earth-High-Deep-Seas-Insight.pdf. Deep-sea research does not take into account the superficial layer (epipelagic systems) of the high seas.

53 Ducklow *et al.* (n 49).

54 AD Rogers, 'Environmental change in the deep ocean' (2015) 40(1) *Annual Review of Environment and Resources* 1–38; CW Armstrong *et al.*, 'Services from the deep: Steps towards valuation of deep sea goods and services' (2012) 2 *Ecosystem Services* 2–13.

55 Armstrong *et al.* (n 54).

understanding of the deep sea limits the assessment of climate change risks.[56] In addition, the deep sea is heterogenous and possesses a range of environmental characteristics that support a variety of ecosystems,[57] so knowledge of climate feedbacks in biological systems is limited.[58] Projected consequences of a warmer,[59] more acidic deep sea with less oxygen[60] includes species and productivity redistributions,[61] habitat compression, biodiversity loss and changes in body size, food webs and connectivity that can influence commercial harvest, carbon sequestration and nutrient cycling.[62] Climatic changes will also negatively affect food supply, essentially particulate organic matter, on the deep seafloor.[63] Understanding how climate change will influence important physical drivers of benthic carbon cycling, ecosystem functions and derived ecosystem services remain understudied. As a result, predicted changes remain largely unresolved. Nevertheless, dismissing the heterogeneity of deep-sea ecosystems in climate change scenarios could have unprecedented and potentially irreversible outcomes, so in light of the precautionary principle, deep-sea ecosystems should be considered 'rare or fragile' under the LOSC and protected from interference from human activities.[64]

Therefore, marine biodiversity and ecosystems are a vital component of the climate system and its functioning that deserve urgent protection as part of

56 LA Levin, 'IPCC and the deep sea: A case for deeper knowledge' (2021) 3 *Frontiers in Climate* 720755.

57 E Ramirez-Llodra *et al.*, 'Deep, diverse and definitely different: Unique attributes of the world's largest ecosystem' (2010) 7(9) *Biogeosciences* 2851–2899; M Baker *et al.* (eds), *Natural Capital and Exploitation of the Deep Ocean* (Oxford University Press, Oxford, 2020).

58 SROCC Report, Summary for Policy Makers (n 21); Levin (n 56).

59 DG Desbruyères *et al.*, 'Deep and abyssal ocean warming from 35 years of repeat hydrography' 43(19) *Geophysical Research Letters* 10356–10365.

60 D Breitburg *et al.*, 'Declining oxygen in the global ocean and coastal waters' (2018) 359(6371) *Science* eaam7240.

61 M Pinsky *et al.*, 'Preparing ocean governance for species on the move' (2018) 360(6394) *Science* 1189–1191.

62 AK Sweetman *et al.*, 'Major impacts of climate change on deep-sea benthic ecosystems' (2017) 5(4) *Elementa: Science of the Anthropocene* 1–23; I Brito-Morales *et al.*, 'Climate velocity reveals increasing exposure of deep-ocean biodiversity to future warming' (2020) 10(6) *Nature Climate Change* 576–581; LA Levin *et al.*, 'Climate change considerations are fundamental to management of deep-sea resource extraction' (2020) 26(9) *Global Change Biology* 4664–4678.

63 Sweetman *et al.* (n 62); Levin *et al.* 2020 (n 62); Bindoff *et al.* (n 20).

64 LOSC (n 32), Article 194(5); see also CBD (n 7), Preamble; CBD Decision II/10, Annex II, para 3, as discussed in *The South China Sea Arbitration* (*The Republic of The Philippines* v. *The People's Republic of China*), Award, 12 July 2016, Permanent Court of Arbitration (PCA), PCA Case No. 2013–19, ICGJ 49, paras 939–945.

the interpretation and implementation of LOSC provisions on the prevention of marine pollution, the protection of the marine environment, and the application of precaution at the ocean-climate nexus. More specific considerations in this connection arise from the emerging literature and policy discussions on 'blue' carbon ecosystems, which are discussed next, with a view to signposting knowledge gaps and opportunities for ocean-based climate action.

Blue Carbon Ecosystems and Ocean-based Climate Action

'Blue carbon' commonly refers to the carbon captured by coastal marine ecosystems, typically specified as saltmarshes, seagrass and mangroves, which accumulate large stocks of organic carbon in their soil and biomass.[65] In addition to sequestering CO_2 as an ecosystem service, these coastal habitats also provide coastal protection from erosion and extreme weather, are rich in biodiversity and are important nurseries for fish species, including those that are commercially and nutritionally important. Considering the range of benefits that blue carbon ecosystems provide, they can be framed as providers of mitigation-adaptation co-benefits. The IPCC developed the 2006 Guidelines for National Greenhouse Gas Inventories, which include a chapter on coastal wetlands, including tidal (salt)marshes, mangroves and seagrass meadows,[66] with supplementary guidelines on 'teal' carbon ecosystems[67] – carbon stored in inland freshwater terrestrial (non-tidal) wetlands.[68] Certain States have already included the restoration and protection of coastal blue carbon ecosystems in their nationally determined contributions (NDCs) under the Paris Agreement.[69]

65 L Wylie, AE Sutton-Grier and A Moore, 'Keys to successful blue carbon projects: Lessons learned from global case studies' (2016) 65 *Marine Policy* 76–84; Bindoff *et al.* (n 20); Hilmi *et al.* (n 48); PI Macreadie *et al.*, 'Blue carbon as a natural climate solution' (2021) 2(12) *Nature Reviews: Earth and Environment* 826–839.

66 IPCC, *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands* [T Hiraishi *et al.* (eds)] (IPCC, Switzerland, 2014) available at https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/. During discussions with delegates at the 2023 Ocean-Climate Dialogue at the UNFCCC intersessional meetings, it became apparent that several Parties to the Paris Agreement were not aware of this supplement.

67 SJ Dundas *et al.*, 'Integrating oceans into climate policy: Any green new deal needs a splash of blue' (2020) 13(5) *Conservation Letters* e12716.

68 AM Nahlik and M Siobhan Fennessy, 'Carbon storage in US wetlands' (2016) 7(1) *Nature Communications* 1–9.

69 A Martin *et al.*, *Blue Carbon – Nationally Determined Contributions Inventory. Appendix to: Coastal Blue Carbon Ecosystems: Opportunities for NDCs* (GRID-Arendal, Norway, 2016).

Other sinks for organic carbon (carbon stored in living things) include the biomass associated with marine animals and plants. Fish sequester organic carbon as they die, sink and decompose at depth.[70] Macroalgae are widely abundant and as a result are garnering increasing attention for their potential as a carbon sink, however this potential remains unquantified.[71] Furthermore, this potential is contested by research that indicates that not only are macroalgae an inefficient pathway for carbon storage,[72] but that they could also be a source of carbon to the atmosphere.[73] These uncertainties highlight the large knowledge and data gaps in relation to the controls and sensitivities of this ecosystem service in these relatively 'well-known' habitats.[74] Despite the uncertainty, administrative and financial risks posed by restoration of marine blue carbon habitats, these risks are outweighed by the associated co-benefits of this activity in terms of supporting local blue economies and climate adaptation potential.[75]

One way to promote sequestration of carbon by these ecosystems is the reduction of wider pressures on blue carbon ecosystems that limit their ability to sequester carbon from the atmosphere.[76] In policy terms, this could be achieved through the creation and management of marine protected areas (MPAs) as blue carbon assets, in addition to their conservation features.[77]

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70 D Bianchi *et al.*, 'Estimating global biomass and biogeochemical cycling of marine fish with and without fishing' (2021) 7 *Science Advances* eabd7554; G Mariani *et al.*, 'Let more big fish sink: Fisheries prevent blue carbon sequestration-half in unprofitable areas' (2020) 6(44) *Science Advances* eabb4848.

71 LP Gouvêa *et al.*, 'Golden carbon of Sargassum forests revealed as an opportunity for climate change mitigation' (2020) 729(8) *Science of the Total Environment* 138745; Hilmi *et al.* (n 48); Macreadie *et al.* (n 65); A Bellgrove *et al.*, 'Patterns and drivers of macroalgal "blue carbon" transport and deposition in near-shore coastal environments' (2023) 890(9) *Science of The Total Environment* 164430.

72 C Hu *et al.*, 'On the Atlantic pelagic Sargassum's role in carbon fixation and sequestration' (2021) 781(8) *Science of the Total Environment* 146801.

73 LT Bach and PW Boyd, 'Seeking natural analogs to fast-forward the assessment of marine CO_2 removal' (2021) 118(40) *Proceedings of the National Academy of Sciences* 1–8; JB Gallagher *et al.*, 'Seaweed ecosystems may not mitigate CO_2 emissions' (2022) 79(3) *ICES Journal of Marine Sciences* 585–592.

74 See article by E Morgera *et al.*, 'Addressing the ocean-climate nexus in the BBNJ Agreement: Strategic environmental assessments, human rights and equity in ocean science' (2023) 38(3) *IJMCL*, this issue.

75 S Rees and HJ Niner, 'Blue carbon: Climate change and ecosystem services' (One Ocean Hub blog, 31 October 2022) available at https://oneoceanhub.org/blue-carbon-climate-change-and-ecosystem-services/.

76 Bindoff *et al.* (n 20).

77 J Howard *et al.*, 'The potential to integrate blue carbon into MPA design and management' (2017) 27(S1) *Aquatic Conservation: Marine and Freshwater Ecosystems* 100–115; Macreadie *et al.* (n 65).

In addition, it is recommended to consider conserving potential climate refugia, understood as '[areas] where climate change will not severely affect a species or its habitat', and designating dynamic MPAs, understood as 'MPAs that are planned to shift across latitudinal gradients as species distribution [is] expected to shift according to climate change models'.[78] Reference is also made to climate-responsive marine spatial planning (MSP), which will involve managing 'pressures' exerted on the environment as a proxy target for effective protection of marine ecosystems, including an increase in blue carbon asset 'value' as an area is allowed to recover.[79] Another way of promoting blue carbon is through the restoration of blue carbon habitats (planting of seagrass beds, kelp, mangroves, seeding of biogenic reefs) that offer climate protection and reduce the impacts of climate-induced extreme weather events, such as tidal waves and storminess.[80]

In addition, a reduction in damaging fishing practices has been proposed as one option for blue carbon stock protection (and long-term enhancement).[81] Trawling and dredging of the seabed can resuspend carbon held in sediment into the water column, perpetuating its release back into the atmosphere.[82] Fishing more generally interrupts the transport of carbon to seafloor sediments by dead and vertically migrating organisms and storage through the removal of organisms from the system entirely.[83] This is of particular importance in the context of the emerging industrial mesopelagic (200–1,000 metres below

78 UNESCO-IOC and European Commission, *MSPglobal International Guide on Marine/Maritime Spatial Planning*, IOC Manuals and Guides No. 89 (UNESCO, Paris, 2021) 40, drawing on G Robbert Besbroek, RJ Swart and WGM van der Knaap, 'The mitigation-adaptation dichotomy and the role of spatial planning' (2009) 33(3) *Habitat International* 230–37.

79 SE Rees *et al.*, 'A marine natural capital asset and risk register: Towards securing the benefits from marine systems and linked ecosystem services' (2022) 59(4) *Journal of Applied Ecology* 1098–1109.

80 VT van Zelst *et al.*, 'Cutting the costs of coastal protection by integrating vegetation in flood defences' (2021) 12(1) *Nature Communications* 6533; R Costanza *et al.*, 'The global value of coastal wetlands for storm protection' (2021) 70 *Global Environmental Change* 102328; ME Hanley *et al.*, 'The gathering storm: Optimizing management of coastal ecosystems in the face of a climate-driven threat' (2020) 125(2) *Annals of Botany* 197–212; D Roberts *et al.*, 'Exploring ecosystem-based adaptation in Durban, South Africa: "Learning-by-doing" at the local government coal face' (2012) 24(1) *Environment and Urbanization* 167–195.

81 UNFCCC, 'High level remarks and opening (Peter Thomson, UN Secretary General's Special Envoy for the Ocean)' (13 June 2023) available at https://unfccc.int/event/ocean-and-climate-change-dialogue-2023-day-1.

82 E Sala *et al.*, 'Protecting the global ocean for biodiversity, food and climate' 592 *Nature* (2021) 397–402.

83 Mariani *et al.* (n 70).

the ocean surface) fishery,[84] such as hatchetfishes and lanternfishes, which are of commercial interest for production of fish oil supplements and animal feed (including for commercial aquaculture).[85] Many mesopelagic fish species shift in and out of deep water daily, avoiding predators during the day and feeding at the surface at night,[86] thereby actively sequestering and transporting carbon to deep water for storage at a high rate.[87] As these fish species are estimated to be one of the most abundant groups of vertebrates in the world, maintaining mesopelagic fish stocks at healthy levels is imperative to ensure their carbon sequestration,[88] hence the growing calls for a global moratorium on mesopelagic fishing.[89] The protection and restoration of fish and other marine vertebrate populations to healthy levels should be considered a key ocean nature-based climate mitigation option, thanks to the greater capacity for carbon storage than some coastal blue carbon ecosystems.[90] However, such protection and restoration are not yet formally considered under the international climate change regime.

Ocean-based carbon dioxide removal has also been identified as a potential option to enhance the drawdown of atmospheric carbon dioxide into blue carbon stocks.[91] In addition, blue carbon options could arguably include ocean fertilisation and macroalgal culture to promote photosynthesis and drawdown and storage of carbon via an enhanced biological pump,[92] the deposition of terrestrially based organic waste, artificial up/downwelling, ocean alkalinity enhancement, coastal enhanced weathering and direct capture methods.[93]

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84 S Paoletti *et al.*, 'Potential for mesopelagic fishery compared to economy and fisheries dynamics in current large scale Danish pelagic fishery' (2021) 8 *Frontiers in Marine Science* doi: 10.3389/fmars.2021.720897.

85 *Ibid.*

86 *Ibid.*

87 TT Sutton, 'A global biogeographic classification of the mesopelagic zone' (2017) 26 *Deep-Sea Research Part I* 5–102.

88 LG Elsler *et al.*, 'Protecting ocean governance through biodiversity and climate governance' (2021) 9 *Frontiers in Marine Science* doi: 10.3389/fmars.2022.880424.

89 Blue Marine Foundation, 'Entering the twilight zone: Global moratorium needed on mesopelagic fishing' (9 December 20202) available at https://www.bluemarinefoundation.com/2020/12/09/the-twilight-zone/; UNFCCC Remarks (n 81).

90 Mariani *et al.* (n 70).

91 SR Cooley *et al.*, 'Sociotechnical considerations about ocean carbon dioxide removal' (2023) 15(1) *Annual Review of Marine Science* 41–66; LA Levin *et al.*, 'Deep-sea impacts of climate interventions' (2023) 379(6636) *Science* 978–981; SM Smith *et al.*, *The State of Carbon Dioxide Removal – 1st Edition* (2023) doi: 10.17605/OSF.IO/W3B4Z, available at https://www.stateofcdr.org.

92 Cooley *et al.* (n 91).

93 *Ibid.*; see also Levin *et al.* (n 91).

However, methods such as these, many untested at scale or locally, have the potential to lead to myriad negative impacts at all depths of the ocean.[94] These impacts may in turn alter the dynamics of the ocean ecosystem and themselves risk degrading ecosystem services, including nutrient cycling and commercial fish stocks and, consequently, carbon sequestration.[95] These options, therefore, raise critical questions with regard to the application of the ecosystem and precautionary approaches, which have already been identified, to some extent, under the CBD.[96]

In summary, consideration of blue carbon emphasises the need to support under the LOSC and the international climate change regime, marine ecosystem restoration, climate-responsive MPAs and MSP, and reductions in damaging fishing practices as ocean nature-based solutions, which also contribute to complying with the CBD. On the other hand, ocean-based carbon dioxide removal technologies raise concerns about negative impacts on biodiversity and human rights that have already been identified, at least to some extent, under the CBD and are relevant under the LOSC general obligations to protect the marine environment.

The International Climate Change Regime and the Ocean: Where Are We?

Against the foregoing background, this section reflects on the growing, but still very limited, relevance of the ocean under the international climate change regime. While the IPCC has been assessing the relevant science on the pivotal role played by the ocean in both driving the climate system and mitigating climate change since the 1990s when negotiations for the UN Framework Convention on Climate Change (UNFCCC)[97] were launched, there has been slow consideration of the ocean-climate nexus under the UN climate change regime to date.[98] This cannot be over-emphasised in the current debate on the integration of ocean-based climate action.

94 Levin *et al.*, *ibid.*

95 *Ibid.*

96 Morgera (n 21); CBD COP9, Decision IX/16 C, Ocean fertilization, UN Doc UNEP/CBD/COP/DEC/IX/16 (9 October 2008); CBD COP10, Decision X/33, Biodiversity and climate change, UN Doc UNEP/CBD/COP/DEC/X/33 (29 October 2010), para 8(w); UNFCCC, 'Setting the scene (Tristan Tyrrell, CBD)' (13 June 2023) available at https://unfccc.int/event/ocean-and-climate-change-dialogue-2023-day-1.

97 United Nations Framework Convention on Climate Change (New York, 9 May 1992, in force 21 March 1994), 1771 *UNTS* 107 [UNFCCC].

98 See figure by E Harrould-Kolieb, 'The "blueing" of the climate regime: Consideration of the ocean in the international climate change regime' (One Ocean Hub, 2023) available

The First Assessment Report by the IPCC, published in 1990, warned that climate change would fundamentally impact the ocean and coastal areas, as well as marine ecosystems:[99] 'the projected global warming will cause sea-level rise, modify ocean circulation, and cause fundamental changes to marine ecosystems, with considerable socioeconomic consequences'.[100] The IPCC projected that sea level rise could render some island countries uninhabitable and displace millions of people.[101] It also predicted that climate impacts on the global ocean will lead to 'changes in habitats, a decrease in biological diversity and shifts in marine organisms and productive zones, including commercially important species. Such regional shifts in fisheries will have major socioeconomic impacts'.[102]

The UNFCCC's main objective is to avoid dangerous anthropogenic interference with the climate system,[103] including the ocean.[104] In addition, among general commitments, an obligation for Parties to cooperate towards conserving and enhancing carbon sinks and reservoirs explicitly refers to coastal and marine ecosystems.[105] Further, UNFCCC Parties are required to 'support and further develop, as appropriate, international and intergovernmental programmes and networks or organisations aimed at defining, conducting, assessing and financing research, data collection and systematic observation',[106] which led to the creation of various intergovernmental scientific bodies for climate monitoring and information exchange.[107] Reports by these bodies are regularly considered by the UNFCCC Subsidiary Body for Scientific and

at https://oneoceanhub.org/wp-content/uploads/2023/07/Figure-1-the-blueing-of-the-climate-regime.pdf.

99 See, IPCC, 'Policymakers' Summary of the Potential Impacts of Climate Change: Report from Working Group II to IPCC' (Australian Government Publishing Service, Canberra, 1990) 89 (para 24) available at https://digitallibrary.un.org/record/763957?ln=en.

100 *Ibid*., at p. 105 (para 6.01).

101 *Ibid*., at p. 89 (para 24).

102 *Ibid*. (para 25).

103 UNFCCC (n 97), Article 2.

104 UNFCCC Article 1(3) defines the climate system as 'the totality of the atmosphere, *hydrosphere*, biosphere and geosphere and their interactions' (emphasis added). Note that this definition is included in both Article 2(a)(ii) of the Kyoto Protocol and in the preambular paragraph 13 of the Paris Agreement (n 33).

105 UNFCCC (n 97), Article 4.1(d).

106 *Ibid*., Article 5(a).

107 See in particular, the Global Climate Observing System co-sponsored by the World Meteorological Organization, the Intergovernmental Oceanographic Commission of UNESCO and the International Council for Science. For a discussion, see F Yamin and J Depledge, *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge University Press, Cambridge, 2004) 199–200.

Technological Advice (SBSTA). Since 2019, the SBSTA has also considered the ocean in the context of the Nairobi Work Programme on impacts, vulnerability and adaptation to climate change.[108]

On the back of substantial advocacy by the global ocean community, including scientific institutions, non-governmental organisations and large ocean States, the Paris Agreement[109] preamble recognised 'the importance of ensuring the integrity of all ecosystems, including oceans'.[110] As the preambles of international treaties are considered to have interpretative value, we argue that the legal structure of the Paris Agreement includes elements that should be interpreted so as to consider the ocean-climate nexus. The Paris Agreement sets the goal of limiting the global average temperature increase to well below 2°C from pre-industrial times and undertaking efforts to limit it to 1.5°C,[111] with the current focus being on the 1.5°C target. Under the Paris Agreement's mitigation regime, climate targets and mitigation actions are being determined at the national level[112] and complemented by requirements for transparency and reporting for all Parties.[113] The Agreement also includes a number of procedural legal obligations relating to NDCs, including that each Party must have an NDC and regularly increase its ambition, with guidance on their formulation adopted internationally.[114] NDCs focus on mitigation, but they can also cover adaptation and needs for financial support. Current international guidance on NDCs does not refer to most detailed mitigation policies, including those related to the ocean.[115]

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108 UNFCCC, Subsidiary Body for Scientific and Technological Advice (SBSTA), *Report of the Subsidiary Body for Scientific and Technological Advice on its Forty-seventh Session, held in Bonn from 6 to 15 November 2017*, UN Doc FCCC/SBSTA/2017/7 (31 January 2018), para 21.

109 Paris Agreement (n 33). For a reflection on the approaches of the two instruments, see J Depledge, 'The "top-down" Kyoto Protocol? Exploring caricature and misrepresentation in literature on global climate change governance' (2022) 22 *International Environmental Agreements: Politics, Law and Economics* 673–692.

110 Paris Agreement (n 33), preambular para 13.

111 *Ibid*., Article 2.1.a.

112 *Ibid*., Article 4.

113 *Ibid*., Article 13; see H Van Asselt and K Kulovesi, 'Article 13: Enhanced transparency framework for action and support' in G van Calster and L Reins (eds), *The Paris Agreement on Climate Change* (Edward Elgar, Cheltenham, 2021) 302–325.

114 Paris Agreement (n 33), Article 4; UNFCCC, 'Decision 4/CMA.1 Further guidance in relation to the mitigation section of decision 1/CP.21' in *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement on the Third Part of its First Session, held in Katowice from 2 to 15 December 2018*, UN Doc FCCC/PA/CMA/2018/3/Add.1 (19 March 2019).

115 UNFCCC, 'Decision 4/CMA.1' (n 114), para 20.

Towards Increased Recognition of the Ocean-Climate Nexus under the UN Climate Regime

As a result of prominent ocean advocacy since 2009,[116] and the adoption of several high-level political declarations,[117] ocean-related issues have been increasingly reflected in UNFCCC Conference of the Parties (COP) decisions.[118] In 2019 in Madrid, the COP mandated the convening of the first ocean and climate dialogue.[119] Recommendations arising from the 2020 dialogue pointed to the need to strengthen the profile and consideration of the ocean across existing UNFCCC processes; address gaps and needs in relation to ocean and climate knowledge and action under the UNFCCC process; include the ocean in the assessment of collective progress and in the global stocktake; recognise and amplify synergies, complementarities and collective efforts across the UN; align global finance to support ocean and climate action; and develop technical guidelines for accessing finance and approaches for innovative financing structures.[120] In addition, the 2020 dialogue recommendations also focused on national-level action, namely, to include ocean action through ambitious NDCs; support mainstreaming of coherent action across biodiversity, ocean and climate change agendas; invest in ocean science and monitoring; develop and/or strengthen integrated national policies for ocean and climate action; and invest in ocean and climate action that is biodiversity-neutral and, ideally, biodiversity-positive.[121]

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116 See International Institute for Sustainable Development (IISD), 'Oceans Action Day at COP 25' (Earth Negotiations Bulletin, December 2019) available at https://enb.iisd.org/climate/cop25/oceans-action-day/about.html; IISD, 'Ocean Pathway launched at COP 23' (SDG Knowledge Hub, 2017) available at https://sdg.iisd.org/news/ocean-pathway-launched-at-cop-23/.

117 Manado Ocean Declaration (14 May 2009, Manado, Indonesia), paras 19, 20, available at https://www.gc.noaa.gov/documents/051409-manado_ocean_declaration.pdf; Brussels Declaration on the Ocean and Climate Change (19 February 2019, Brussels) available at https://climat.be/doc/CliChaOcePre_Declaration_19-02-2019.pdf; Because the Ocean Declaration, launched on Day 1 of COP26, see 'High level call for an ambitious ocean outcome at COP26' (Because the Ocean, November 2021) available at https://www.becausetheocean.org/high-level-call-for-an-ambitious-ocean-outcome-at-cop26/.

118 J Brunnée, 'COP-ing with consent: Law-making under multilateral environmental agreements' (2002) 15(1) *Leiden Journal of International Law* 1–52.

119 UNFCCC, 'Decision 1/CP.25, Chile Madrid Time for Action' in *Report of the Conference of the Parties on its Twenty-fifth Session, held in Madrid from 2 to 15 December 2019*, UN Doc FCCC/CP/2019/13/Add.1, paras 30–34.

120 UNFCCC, SBSTA, *Ocean and Climate Change Dialogue to Consider How to Strengthen Adaptation and Mitigation Action: Informal Summary Report by the Chair of the Subsidiary Body for Scientific and Technological Advice* (29 April 2021) 5.

121 *Ibid.*

The 2021 Glasgow COP invited the SBSTA Chair to hold an annual dialogue on strengthening ocean-based action and to prepare an informal summary report for subsequent COPs.[122] Moreover, the preamble of the Glasgow Climate Pact referred to ensuring the integrity of ocean ecosystems when taking action to address climate change,[123] and underscored the importance of protecting, conserving and restoring marine ecosystems acting as carbon sinks to achieve the long-term goal of the Convention.[124] It also *invited* relevant work programmes and constituted bodies under the UNFCCC and the Paris Agreement to *consider* how to strengthen and integrate ocean-based action in their existing mandates and work plans and report on these activities.[125] This was considered by the ocean community as the potential start of inter-governmental work on the ocean-climate nexus under the international climate change regime,[126] but clearly fell short of launching action on the detailed recommendations from the 2020 dialogue.

The 2022 Sharm el-Sheikh Implementation Plan referred to the international recognition of the human right to a healthy environment and reiterated the importance of marine ecosystems acting as sinks for greenhouse gases.[127] It further specified details of the ocean and climate dialogues, by mandating two co-facilitators, selected by Parties biennially, to decide specific topics for the dialogue, in consultation with Parties and observers, and prepare informal summary reports for consideration by the COP.[128] In addition, the Sharm

122 UNFCCC, 'Decision 1/CP.26 Glasgow Climate Pact' in *Report of the Conference of the Parties on its Twenty-sixth Session, held in Glasgow from 31 October to 13 November 2021*, UN Doc FCCC/CP/2021/12/Add.1 (8 March 2022), para 61. This has been reiterated in the COP27 outcomes. See UNFCCC, Decision 1/CP.27 Sharm el-Sheikh Implementation Plan (n 37), paras 49–50; UNFCCC, 'Decision 1/CMA.4 Sharm el-Sheikh Implementation Plan' in *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement on its Fourth Session, held in Sharm el-Sheikh from 6 to 20 November 2022*, UN Doc FCCC/PA/CMA/2022/10/Add.1 (17 March 2023), para 79.

123 UNFCCC, Decision 1/CP.26 Glasgow Climate Pact (n 122), preamble.

124 *Ibid.*, para 21; UNFCCC, 'Decision 1/CMA.3 – Glasgow Climate Pact' in *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement on its Third Session, held in Glasgow from 31 October to 13 November 2021*, UN Doc FCCC/PA/CMA/2021/10/Add.1 (8 March 2022), para 38.

125 UNFCCC, Decision 1/CP.26 Glasgow Climate Pact (n 122), para 60 (emphasis added).

126 M Lennan and E Morgera, 'The Glasgow Climate Conference (COP26)' (2022) 37(1) *IJMCL* 137–151.

127 UNFCCC, Decision 1/CP.27 Sharm el-Sheikh Implementation Plan (n 37), preamble and para 18; see also M Lennan and E Morgera, 'UN Climate COP 27: What news for the ocean?' (One Ocean Hub blog, 6 December 2022) available at https://oneocean hub.org/un-climate-cop-27-what-news-for-the-ocean/.

128 UNFCCC, Decision 1/CP.27 Sharm el-Sheikh Implementation Plan (n 37), para 49.

el-Sheikh Implementation Plan focused attention on national-level action, by encouraging 'Parties to consider, as appropriate, ocean-based action in their national climate goals and in the implementation of these goals, including but not limited to [NDCs], long-term strategies and adaptation communications'.[129] Once again, the opportunity was missed to endorse in more detail the recommendations from the 2020 and 2021 dialogues.[130]

Opportunities for Further Action under the UNFCCC?

Our argument is that the future ocean and climate dialogues should lead to identifying continuing workstreams under the UNFCCC that can enhance and support Parties' progress on ocean-based climate action. One possibility relates to enhancing the role of blue carbon under the market-based mechanisms established under the Paris Agreement.[131] However, there are doubts about how to quantify emission reductions in the context of blue carbon, and setting up an institutional structure for governing blue carbon markets can be more complicated than for land-based carbon markets. Many projects would only be financially viable at a larger scale and therefore placed in the context of complex management frameworks and overlapping jurisdictions.[132] In addition, experience from the use of market mechanisms highlights the importance of considering environmental integrity and human rights in implementing carbon projects. Concerns include 'increasing risks to the enjoyment of human rights to food, water, sanitation and housing, especially for people and communities whose livelihoods depend on land', particularly Indigenous peoples'.[133] This risk may be considered even higher in the context of marine areas, where there is less recognition of historical dispossession.[134] In anticipating what potential approaches could be taken in this connection, the following section

129 *Ibid*., para 50.

130 See UNFCCC, SBSTA, *Ocean and Climate Change Dialogue 2022, Informal Summary Report by the Chair of the Subsidiary Body for Scientific and Technical Advice* (SBSTA, 2022) available at https://unfccc.int/sites/default/files/resource/OceanAndClimateChangeDialogue2022_summary%20report.pdf?download.

131 Paris Agreement (n 33), Article 6.

132 JA Ekstrom *et al*., 'A tool to navigate overlaps in fragmented ocean governance' (2009) 33(3) *Marine Policy* 532–535.

133 UNGA, *Promotion and Protection of Human Rights in the Context of Climate Change*, UN Doc A/77/226 (26 July 2022), paras 19–22 [Special Rapporteur Ian Fry Report].

134 D Wilson, 'European colonisation, law, and indigenous marine dispossession: Historical perspectives on the construction and entrenchment of unequal marine governance' (2021) 20(4) *Maritime Studies* 387–407.

draws a comparison with the approach used for reducing emissions from deforestation and forest degradation (REDD+), for which COP decisions were taken to set institutional arrangements, identify features to enable finance for forest protection and establish requirements to report on how implemented projects avoid social and environmental harm.[135]

On climate adaptation, the Paris Agreement recognises the role of adaptation in protecting ecosystems and livelihoods.[136] It calls for adaptation actions that take into account vulnerable groups and ecosystems 'guided by the best available science and, as appropriate, traditional knowledge, knowledge of Indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions'.[137] There is also a recognition by CBD Parties that ecosystem and biodiversity functions contribute significantly to climate change adaptation and disaster risk reduction.[138] While the Paris Agreement largely defers to the national level in terms of concrete adaptation actions, the Adaptation Committee has not yet discussed ocean-based adaptation.

With regard to finance, the ocean has limited traction, as around 90 per cent of the estimated US$850–940 billion of climate finance flows for 2021[139] going towards climate mitigation is largely focussed on energy systems and transport. Only 3.7 per cent of global climate finance annually flows into the water and waste sector.[140] The lack of an explicit category for the ocean under the Green Climate Fund means that it is not clear what proportion of the total Fund expenditure of US$45.1 billion (including co-financing) over 216 approved projects relates to ocean issues.[141] Meanwhile, SDG 14 ('life below

135 ME Recio, 'The Warsaw Framework and the future of REDD' (2014) 24(1) *Yearbook of International Environmental Law* 37–69.

136 Paris Agreement (n 33), Article 7(2).

137 *Ibid*., Article 7(5).

138 CBD COP15, Decision XIV/5, Biodiversity and climate change, UN Doc CBD/COP/DEC/14/5 (30 November 2018), preamble; see also Secretariat of the CBD, *Voluntary Guidelines for the Design and Effective Implementation of Ecosystem-Based Approaches to Climate Change adaptation and Disaster Risk Reduction*', CBD Technical Series No. 93 (CBD, Montreal, 2019) available at https://www.cbd.int/doc/publications/cbd-ts-93-en.pdf.

139 In 2021. See B Naran *et al*., *Global Landscape of Climate Finance: A Decade of Data 2011–2020* (Climate Policy Initiative, 2022) 7, available at https://www.climatepolicyinitiative.org/wp-content/uploads/2022/10/Global-Landscape-of-Climate-Finance-A-Decade-of-Data.pdf.

140 US$24 billion (2019–2020), *ibid*.

141 For example, projects such as the US$25 million Climate Resilient Fishery Initiative for Livelihood Improvement in the Gambia cover five of the eight results areas of the Green Climate Fund, including ecosystems, forest and land use, health and food security, infrastructure and livelihoods, available at https://www.greenclimate.fund/project/fp188.

water') is the least funded of all the 17 SDGs, receiving less than one per cent of all SDG funding from official development assistance (ODA) up to 2019.[142] The scaling disparity between climate and ocean funding is thus notable: targeting just 20 per cent of climate finance annually towards the ocean would suffice for delivery of SDG 14.[143] And thanks to the high degree of interdependence of SDG14 with other SDGs,[144] investments focussed on SDG 14 can achieve multiple policy objectives, from adaptation resulting in food security and livelihoods, to transport (i.e., maritime) and energy generation (e.g., offshore wind). That said, it cannot be overemphasised that climate funding and ODA funding should be kept separate, and that the UNFCCC and the Paris Agreement defer very much to national decisions on means of implementation and targets for climate finance.

There is clear disparity between the amount of ocean-related climate finance and the growing number of Parties to the Paris Agreement which are formally recognising ocean-based climate action in their NDCs. According to the latest NDC Synthesis Report by the UNFCCC Secretariat:

> An increasing number of Parties (40 per cent) are targeting ocean-based climate action. Some Parties (26 per cent) include an ocean-based climate target, policy or measure. Ocean-related measures reported in the NDCs relate more often to adaptation than to mitigation, there has been an increase in adaptation measures identified related to fisheries and aquaculture and relatively few Parties mentioned offshore renewable energy as a mitigation solution.[145]

Out of 106 new or updated NDCs from island and coastal States, 73 per cent include at least one target, policy, or measure aimed at ocean-based climate actions and 31 of those include at least one target, policy, or measure aimed

142 Scotland (n 30).

143 Estimates are available with regard to financing the ocean-related SDG 14. It is estimated that globally US$174 billion per year is required to deliver SDG 14 by 2030. SDG 14 financing has been in the order of US$10 billion per year (2015–2019), suggesting a six times annual increase in financial resources is required to achieve SDG 14. GG Singh *et al.*, 'A rapid assessment of co-benefits and trade-offs among Sustainable Development Goals' (2018) 93 *Marine Policy* 223–231.

144 *Ibid.*

145 UNFCCC, *National Determined Contributions under the Paris Agreement: Synthesis Report by the Secretariat*, FCCC/PA/CMA/2022/4 (26 October 2022), para 38. The reported synthesised information from 166 of the latest available NDCs submitted by 193 Parties to the Paris Agreement as recorded in the interim registry as of 23 September 2022.

specifically at supporting vulnerable ocean-dependent communities.[146] The further integration of ocean-based action within NDCs as encouraged by the Sharm el-Sheikh work programme can also provide a clearer entry point for channelling ODA towards ocean-based climate action, considering that, for developing countries, climate finance needs to be additional to ODA.[147]

In addition to ocean nature-based solutions, it can be expected that attention at the national level focuses on other activities that can reduce fossil fuel emissions,[148] such as marine renewables.[149] Given the increasing demands for ocean goods and services, the inclusion of ocean-based climate action in NDCs has been linked with MSP processes,[150] which incorporate consultation and participation in the decision-making process, so as to safeguard substantive and procedural human rights.[151] And in effect the Glasgow Climate Pact recognises planning as an important *locus* of decision-making related to the protection, conservation and restoration of ecosystems.[152] It thus encourages Parties to the UNFCCC to take an integrated approach to planning to ensure that ecosystems continue to deliver 'crucial ecosystem services, including acting as sinks and reservoirs of greenhouse gases, reducing vulnerability to climate change impacts and supporting sustainable livelihoods, including for indigenous peoples and local communities'.[153] CBD Parties have also recognised that MSP is 'a participatory tool to facilitate the application of the ecosystem approach' with the full and effective participation of Indigenous peoples

146 M Khan, E Northrop, and L Schindler Murray, 'Ocean-based Climate Action in New and Updated Nationally Determined Contributions' WRI Working Paper (World Resources Institute, Washington, DC, 2022) doi: 10.46830/wriwp.22.00067.

147 For example, the World Bank Group has made a commitment to align all its financing operations with the goals of the Paris Agreement, a commitment which it intends to achieve for new financing by mid-2023. World Bank, 'The World Bank Group and Paris alignment' (2023) available at https://www.worldbank.org/en/publication/paris-alignment.

148 C Le Quéré *et al.*, 'Drivers of declining CO_2 emissions in 18 developed economies' (2019) 9(3) *Nature Climate Change* 213–217.

149 AM Lancaster, 'Reimagining the routes to resilience & renewables in the CARICOM & OECS Caribbean' (2021) 2(2) *Global Energy Law and Sustainability* 121–135.

150 M Lecerf *et al.*, 'Coastal and marine ecosystems as nature-based solutions in new or updated Nationally Determined Contributions' (Ocean & Climate Platform, Conservation International, IUCN, GIZ, Rare, The Nature Conservancy, Wetlands International and WWF, 2021) 25, available at https://ocean-climate.org/wp-content/uploads/2021/06/coastal-and-marine-ecosystem-2806.pdf.

151 BS Halpern *et al.*, 'Managing for cumulative impacts in ecosystem-based management through ocean zoning' (2008) 51(3) *Ocean & Coastal Management* 203–211; CN Ehler, 'Two decades of progress in marine spatial planning' (2021) 132 *Marine Policy* 104–134.

152 UNFCCC, Decision 1/CP.26 Glasgow Climate Pact (n 122), paras 50–51.

153 *Ibid.*

and local communities.[154] UNESCO-IOC and the European Commission have developed international guidance on climate-smart MSP,[155] the implementation of which could be supported by climate finance.[156] But MSP practices remain limited in their evidence base to integrate climate change, as well as socio-ecological dynamics.[157] There is also criticism of public participation in MSP, which remains more akin to 'communication through public comment' than the more 'interactive and proactive approaches' of 'facilitation, negotiation and consensus-building'.[158] And there is a tendency to support a logic of neoliberalism,[159] thereby '[legitimising] the agendas of dominant actors'[160] (say, the development of the offshore renewable energy sector) to the detriment of the manifold social, cultural and spiritual connections between people and the ocean.[161] This points to the need for international guidance and support to national processes linking NDCs and MSP that can help different Parties not to fall into the same pitfalls and rather benefit from lessons learnt across the world.

As discussed in the preceding section, increased financial resources, improved spatial planning and more meaningful participation are required to ensure better integration of ocean-based climate action. An existing initiative under the international climate regime, REDD+, offers valuable lessons. The following section will thus consider how REDD+ focused on climate adaptation

154 CBD COP13, Decision XIII/9, Marine spatial planning and training initiatives, UN Doc CBD/COP/DEC/XIII/9 (9 December 2016), para 2. See also M Ntona and E Morgera, 'Connecting SDG 14 with the other Sustainable Development Goals through marine spatial planning' (2018) 93 *Marine Policy* 214–222.

155 UNESCO-IOC and European Commission (n 78), at p. 40, but note that the capacity to use MSP to incorporate change and dynamic aspects is still challenging. See E Gissi, S Fraschetti and F Micheli, 'Incoprorating change in marine spatial planning: A review' (2019) 92 *Environmental Science & Policy* 191–200.

156 UNESCO-IOC and European Commission (n 78), at p. 55.

157 UNESCO-IOC, *MSP Global Policy Brief: Climate Change and Marine Spatial Planning*, IOC Policy Brief no. 3 (UNESCO, Paris, 2021), 9.

158 C Frazão Santos *et al.*, 'Major challenges in developing marine spatial planning' (2021) 132 *Marine Policy* 103248; N Rivers *et al.*, 'Shared visions for marine spatial planning: Insights from Israel, South Africa, and the United Kingdom' (2022) 220 *Ocean & Coastal Management* 106069.

159 W Flannery, N Healy and M Luna, 'Exclusion and non-participation in marine spatial planning' (2018) 88 *Marine Policy* 32–40, at p. 32.

160 *Ibid.*

161 *Ibid.*; K Erwin *et al.*, 'Lalela uLwandle: An experiment in plural governance discussions' in R Bosewell, D O'Kane and J Hills (eds), *The Palgrave Handbook of Blue Heritage* (Springer, Cham, 2022); M Strand, N Rivers and B Snow, 'Reimagining ocean stewardship: Arts-based methods to "hear" and "see" Indigenous and local knowledge in ocean management' (2022) 9 *Frontiers in Marine Science* 886632.

together with mitigation, as well as biodiversity and human rights co-benefits, with a view to drawing any lessons to advance consideration of ocean-based climate action. The comparison with REDD+ will then serve to clarify a suitable institutional pathway to channel international climate finance to ocean-based climate action.

International Guidance and Finance for Ocean-based Climate Action: What Lessons Can Be Learnt from REDD+?

The idea behind REDD+[162] was relatively simple: 'forested developing countries reduce deforestation and are financially compensated for their contribution to combating climate change by means of carbon absorption and storage'.[163] REDD+ also supported adaptation, in addition to mitigation, as well as capacity-building. REDD+ has mobilised over US$350 million of results-based payments to date.[164]

And while the initial proposal of REDD+ was for a market-based mechanism, a market under the UNFCCC has not emerged.[165] The main market demand for REDD+ credits has remained circumscribed to the voluntary carbon market, beyond the purview of the Climate Convention.[166] Instead, REDD+ has been conceived as a framework for voluntary efforts by developing countries to reduce emissions from deforestation, as well as an incentive mechanism whereby countries apply for financial payments after implementing and delivering mitigation results through results-based payments.[167] Even if the results-based payments approach placed high expectations on accounting and

162 UNFCCC, 'Decision 4/CP.15, Methodological Guidance for Activities Relating to Reducing Emissions from Deforestation and Forest Degradation and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries' in *Report of the Conference of the Parties on its Fifteenth Session, held in Copenhagen from 7 to 19 December 2009*, UN Doc FCCC/CP/2009/11/Add.1 (30 March 2010).

163 ME Recio, 'Legal Transformation in an Era of Globalization: The Case of REDD+' (PhD Thesis, University of Eastern Finland, Joensuu, 2022) 9, available at https://erepo.uef.fi/handle/123456789/26983.

164 D Maniatis *et al.*, 'Toward REDD+ implementation' (2019) 44 *Annual Review of Environment and Resources* 373–398.

165 A Savaresi, 'A glimpse into the future of the climate regime: Lessons from the REDD+ architecture' (2016) 25(2) *Review of European, Comparative & International Environmental Law* 186–196, at p. 188.

166 Recio (n 163), at p. 57.

167 C Streck, 'Who owns REDD+? Carbon markets, carbon rights, and entitlements to REDD+ finance' (2020) 11(9) *Forests* 2020 959–974; Recio 2022 (n 163), at p. 44.

additionality, in the end accounting was less strict than initially envisioned.[168] In that sense, REDD+ can be considered an example of a 'nature-based solution' (a payment for an ecosystem service) as opposed to the initially expected 'market-based solution'. This example indicates that uncertainty in the measurement of blue carbon flux and storage that impact on certification and crediting[169] would not necessarily stop action under and around the UNFCCC on blue carbon.

Basic norms on REDD+ were agreed on under the UNFCCC, but despite years of negotiations, Parties 'were unable to agree on the establishment of an institution in charge to ensure coherence and coordination in the delivery of financial and technical support to REDD+'[170] under the UNFCCC. Thus, REDD+ was implemented by other international institutions which created *ad hoc* multilateral financing initiatives and programmes, such as the World Bank and the Green Climate Fund, and by donor countries which developed bilateral partnerships to collaborate with developing countries on REDD+.[171]

Using UNFCCC rules as a minimum threshold, organisations outside the UNFCCC developed faster, further social and environmental rules than UNFCCC Parties were willing to agree on.[172] Drawing also from other multilateral environmental agreements and international human rights guidance, these standards had 'significant legal and practical effects, including by interpreting and fleshing out the content of treaties, becoming part of legally binding funding agreements, being integrated into national laws and inspiring the adoption of other international norms'.[173] Admittedly, this led to 'a lack of consistency among international rules and practices on diverse – and often

168 This is based on the consideration that baselines, for example, allow for different approaches to account the emissions (Recio (n 135)) and the poor additionality that the results-based approach ensures (e.g., Brazil was paid on the basis of results from the years prior to the large fires destroying it more recently (Recio 2022 (n 163)).

169 P Williamson and JP Gattuso, 'Carbon removal using coastal blue carbon ecosystems is uncertain and unreliable, with questionable climatic cost-effectiveness' (2022) 4 *Frontiers in Climate* 130–144.

170 Savaresi (n 165), at p. 194.

171 Recio (n 163).

172 UNFCCC, 'Decision 1/CP.16 The Cancun Agreements; Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention' in *Report of the Conference of the Parties on its Sixteenth Session, held in Cancun from 29 November to 10 December 2010*, UN Doc FCCC/CP/2010/7/Add.1 (15 March 2011), Appendix II; ME Recio, 'Transnational REDD+ rule making: The regulatory landscape for REDD+ implementation in Latin America' (2018) 7(2) *Transnational Environmental Law* 283–299; ME Recio, 'Dancing like a toddler, the Green Climate Fund' (2019) 28(2) *Review of European, Comparative & International Environmental Law* 122–135.

173 Recio (n 163), at p. 352.

controversial – subjects, generating competing discourses promoted by different rulemaking sites'.[174] It also led to diminished transparency in the adoption of safeguards[175] and a shift in decision-making power from developing (REDD+ host) countries to developed (donor) countries.[176] The adoption of these standards, however, did not prevent negative impacts on the environment[177] and Indigenous peoples' human rights.[178] For that reason, the REDD+ financing initiatives, such as the Green Climate Fund, set up additional requirements, such as redress mechanisms at the entity and project levels.[179]

Furthermore, it has been argued that with the adoption of the Paris Agreement, REDD+ has transformed from 'a means to merely enable developing countries to reduce emissions on a voluntary basis, to a means to enable them to comply with the pledges made in their NDCs', with finance coming from 'a variety of sources' that has been 'disbursed beyond market-based logics and the institutional remit of the UNFCCC'.[180] In a similar way, blue carbon could be used to contribute to the accomplishment of NDCs with support from a variety of financing sources. Many developing countries have received funding for REDD+ preparatory activities, which would be also an interesting aspect to incorporate in the consideration of the establishment of blue carbon projects. This would be instrumental to enabling ocean-based climate action at a larger scale, as the REDD+ experience has shown that only a few actors have completed the preparatory stages and applied successfully for results-based payments from the Green Climate Fund.[181] Another opportunity offered by the approach proposed is that the Green Climate Fund has some valuable

174 *Ibid.*, at p. 354.

175 *Ibid.*, at p. 349.

176 Recio 2018 (n 172), at p. 298.

177 B Bodin, E Väänänen and H van Asselt, 'Putting REDD+ environmental safeguards into practice: recommendations for effective and country-specific implementation' (2015) 9(2) *Carbon & Climate Law Review* 168–182; A Savaresi, 'The legal status and role of REDD-Plus safeguards' in C Voigt (ed.), *Research Handbook on REDD+ and International Law* (Edward Elgar, Cheltenham, 2016), 126–156.

178 S Carodenuto and K Fobissie, 'Operationalizing free, prior and informed consent (FPIC) for REDD+' (2015) 9(2) *Carbon & Climate Law Review* 156–167; A Savaresi, 'REDD+ and human rights: Addressing synergies between international regimes' (2013) 18(3) *Ecology and Society* 5–14.

179 Green Climate Fund (GCF), 'Decision B.07/02 – Decisions of the Board – Seventh Meeting of the Board, 18–21 May 2014', GCF Doc GCF/B.07/11 (19 June 2014).

180 Savaresi (n 165), at pp. 188–189.

181 GCF, 'GCF Support for the Early Phases of REDD+', GCF Doc GCF/B.17/16 (2 July 2017), para 25. The document clarifies that 'key actors may include governments (national, subnational, local); local communities (indigenous communities, rural communities, forest-dependent groups, etc.); private sector (producers, providers, financial institutions,

perspectives on how to address the protection of ecosystems as it has integrated in the context of REDD+ the landscape approach,[182] which could support the teal carbon approach mentioned above.

Much can thus be learnt from what went wrong under REDD+ with a view to developing guidance and financing approaches to blue carbon that ensure respect for international biodiversity and human rights standards. Blue carbon projects can have significant risks, including from a human rights perspective: they could lead to the exclusion of people from sites of restoration and the prioritisation of exogenously-led conservation (or carbon storage) over community-led conservation and customary sustainable use. CBD and international human rights law[183] standards on free prior informed consent should therefore be relied upon for ocean-based climate action in sacred areas for, or territories traditionally used by, Indigenous peoples and local communities, as well as fair and equitable benefit-sharing with them.[184]

In addition, our understanding of the broader societal benefits arising from the protection of marine ecosystem services also points to an opportunity to maximise, as part of blue carbon projects, benefits for the wider population in terms of access to clean water and food, other health benefits and a safer climate as a contribution to the protection of everyone's human right to a healthy environment,[185] including children's human right to a healthy environment.[186] In addition, ecosystem restoration and other nature-based approaches, in particular in deep-sea habitats, should be prioritised, as they require technology and financing to address the lack of baseline information, complexity due to

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service providers, etc.); civil society organizations, and other relevant stakeholders' (para 24).

182 Recio 2019 (n 172), at p. 127.

183 CBD (n 7), Articles 8(j), 10(c); E Morgera, 'Under the radar: Fair and equitable benefit-sharing and the human rights of Indigenous peoples and local communities connected to natural resources' (2019) 23(7) *International Journal of Human Rights* 1098–1139.

184 Framework Principles (n 26), Principle 15.

185 One Ocean Hub, 'Integrating the ocean, climate change adaptation and mitigation, biodiversity (ecosystem restoration) and human rights in practice: Evidence of multiple benefits and replicable methods from Algoa Bay, South Africa' available at https://oneoceanhub.org/wp-content/uploads/2021/11/Algoa-Bay-case-study-16.11.pdf.

186 OHCHR, 'Committee on the Rights of the Child closes ninety-third session after adopting concluding observations on reports of Finland, France, Jordan, Sao Tome and Principe, Türkiye and the United Kingdom' (Press Release, 26 May 2023) available at https://www.ohchr.org/en/news/2023/05/committee-rights-child-closes-ninety-third-session-after-adopting-concluding. The text of the General Comment is not yet publicly available. See article by S Shields, A Longo, M Strand and E Morgera, 'Children's human right to be heard at the ocean-climate nexus' (2023) 38(3) *IJMCL*, this issue.

ocean connectivity and the need for longer time scales before direct benefits of restoration are observed.[187]

Equally, climate finance and technological development towards ecosystem restoration should be prioritised over ocean-based carbon dioxide removal, when the former supports restoration at local scales that is not only beneficial to mitigating climate hazards, but is a way to build stewardship in relation to the 'human-centred benefits of food production, economic livelihoods and emotional well-being' arising from marine ecosystems.[188] Restoration of blue carbon ecosystems may not result in economically viable carbon financing or crediting systems. However, it has the potential to increase climate adaptation, food provisioning and conservation opportunities, and is socially justified, based on the multiple benefits.[189] The next section outlines a conceptual proposal that could make a meaningful contribution towards prioritising climate finance towards ocean-based climate action.

A Multi-actor, Bottom-up Coalition to Integrated and Inclusive Ocean-based Climate Action

As has also been learnt in the REDD+ context, '[g]iven the politicized nature of the UNFCCC regime and the sheer number of its agenda items', bringing in, under the international climate change regime, 'yet another major mitigation item may not be the most effective solution'.[190] To achieve faster and transparent progress on ocean-based climate action under the UNFCCC and at the national level, a bottom-up approach could be used instead. This section explores an opportunity for interested countries, UN bodies and non-State actors to move forward on ocean-based climate action outside of the UN climate negotiations, albeit with a view to mobilising climate finance under the Paris Agreement and taking into account the lessons learnt under REDD+. It draws on the example of the Climate and Clean Air Coalition to promote action on black carbon, which can accelerate warming and is also an air pollutant.

187 R Danovaro *et al.*, 'Marine ecosystem restoration in a changing ocean' (2021) 29(S2) *Restoration Ecology* e13432.

188 D McAfee, R Costanza and SD Connell, 'Valuing marine restoration beyond the "too small and too expensive"' (2021) 36(11) *Trends in Ecology and Evolution* 968–971.

189 Williamson and Gattuso (n 169).

190 V Pekkarinen and Y Yamineva, 'The international climate change regime: Right home for SLCPs?' in Y Yamineva, K Kulovesi and ME Recio (eds), *Reducing Emissions of Short-lived Climate Pollutants: Perspectives on Law and Governance* (Brill, Leiden, forthcoming 2023).

The proposed multi-actor partnership would include new mitigation goals even when challenges persist in quantifying the contribution that emission reductions make to a country's mitigation target, which is one of the key uncertainties with regard to blue carbon. A partnership approach would also by-pass both the priority assigned to mitigation over biodiversity co-benefits and human rights protection, and the limitations in public participation under the UNFCCC and the Paris Agreement. On the latter, the international climate change regime can be seen as one of the weak global systems of accountability that currently do not hold all actors, particularly large-scale industries and the private sector, responsible for negative environmental impacts and related human rights abuses.[191] As affirmed by the UN Special Rapporteur on Climate Change and Human Rights, Ian Fry, '[i]t is a regretful indictment of the current decision-making process that those who are most affected and suffering the greatest losses are the least able to participate in current decision-making. New participatory processes need to be found urgently'.[192] However, those who benefit most from fossil fuel and carbon-intensive industries have 'disproportionate access to decision-makers' and are not yet 'held accountable for the human rights abuses they are underwriting'.[193]

The Climate and Clean Air Coalition is voluntary and flexible, and its emergence was supported by the United Nations Environment Programme (UNEP), which proved 'very successful, in agenda setting on novel environmental issues'.[194] The Coalition was founded in 2012 and currently consists of 80 States, but also non-State actors such as different UN bodies, scientific institutions, civil society and businesses.[195] The objective of the Coalition is 'slowing of the rate of near-term global warming through the reduction of short-lived climate pollutants', but it does not set 'collective reduction targets or require its members to establish concrete goals and reduction pathways'.[196] Every member then independently decides what it wants to achieve under the Coalition

191 High-Level Advisory Board on Effective Multilateralism, *A Breakthrough for People and Planet: Effective and Inclusive Global Governance for Today and the Future* (United Nations University, New York 2023) 24, available at https://www.highleveladvisoryboard.org/breakthrough/pdf/highleveladvisoryboard_breakthrough_fullreport.pdf.

192 Special Rapporteur Ian Fry Report (n 133), paras 73, 77, 80. In contrast, with an assessment of advocacy achievements by Indigenous peoples, see L Wallbot and ME Recio, 'Practicing human rights across scale: Indigenous peoples' affectedness and recognition in REDD+ governance' (2018) 3(5–6) *Third World Thematics: A TWQ Journal* 785–806.

193 Special Rapporteur Ian Fry Report (n 133), para 74.

194 C Unger, 'The Climate and Clean Air Coalition: A voluntary initiative for climate and air quality' in Yamineva *et al.* (eds) (n 190).

195 Further information is available at https://www.ccacoalition.org/en/partners.

196 Unger (n 194).

and makes a relevant declaration when joining. In addition, members contribute voluntarily either through donations or non-monetary activities, such as knowledge.[197]

In the case of the ocean-climate nexus, the goal would be 'protecting and restoring the ocean's contributions to climate regulation, human well-being and planetary health'. UNEP's work on marine ecosystems, on the one hand, and on human rights and the environment, on the other, could be brought together to provide a basis for the Coalition. Other UN bodies could include the Food and Agriculture Organization of the UN, to support climate action within the fisheries sector and the integration of small-scale fishers' knowledge on climate change,[198] and the secretariat of the 2023 Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement), as this new agreement under the law of the sea specifically addresses the ocean-climate nexus and includes considerations of human rights.[199] Other UN members would include the CBD Secretariat, whose 2022 Global Biodiversity Framework includes goals on human rights,[200] nature-based solutions to climate change,[201] increasing marine protected areas[202] and ecosystem restoration,[203] as well as guidance on ecosystems integrity, people's resilience and biodiversity-based livelihoods in the face of climate change.[204] The proposed ocean-climate coalition should also involve

197 *Ibid.*

198 Food and Agriculture Organization of the United Nations (FAO), *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication* (FAO, Rome, 2015), para 9, available at https://www.fao.org/3/i4356en/i4356en.pdf; see also J Nakamura, J Cirne Lima Weston and M Lennan, 'International legal responses for protecting fishers' fundamental rights impacted by a changing ocean' (2023) 38(3) *IJMCL*, this issue.

199 For instance, see the references to humankind or humanity respectively in Articles 5(b) and 9(5) of the Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (New York, 19 June 2023, A/CONF.232/2023/4, not yet in force) [BBNJ Agreement], and those to Indigenous peoples' and traditional knowledge, including to the UN Declaration on the Rights of Indigenous People in the preamble (UNGA Res 61/295 (13 September 2007), United Nations Declaration on the Rights of Indigenous Peoples, UN Doc A/Res/61/295).

200 CBD Decision XV/4 (n 10), Target 22.

201 *Ibid.*, Target 8.

202 *Ibid.*, Target 3.

203 *Ibid.*, Target 2.

204 CBD Decision XIV/5 (n 138), para 4; possibly adapting also CBD COP, Decision XI/9 Progress report on gender mainstreaming, UN Doc UNEP/CBD/COP/DEC/XI/9 (5 December 2012), Annex; and considering the Framework Principles on Human Rights and the Environment (n 26).

human rights experts, such as the UN Office of the High Commissioner for Human Rights and the UN Special Rapporteurs on Climate Change and on Human Rights and the Environment.

In effect, the Climate and Clean Air Coalition as a whole has served 'an integrative, bridging function within the UN System',[205] and across different international legal frameworks, which is one of the key points in the ocean-climate nexus literature and was a challenge under REDD+. One opportunity for the proposed ocean-climate coalition is to support UN-wide coordination during the overlapping (but still disconnected) UN Decade for Ocean Science and the UN Decade for Ecosystem Restoration (2021–2030), notably with a view to prioritising progress on the gaps and limitations on the integration of NDCs and MSP processes, focusing on context-specific approaches and meaningful participation of local communities.

The Climate and Clean Air Coalition is a 'State-led' initiative as they have 'stronger representation in the decision-making body, which has oversight and final say in decision-making, notably funding project proposals'.[206] Non-State actors support 'state-based action through information, analyses, and scientific assessments', notably as part of a Scientific Advisory Panel, which offers suggestions on project proposals to be funded, scientific expertise for policy-making processes, as well as methodologies and tools provided for members.[207] This would be particularly important also for the proposed ocean-climate coalition, given the scientific uncertainties on deep-sea ecosystem services relevant to climate regulation and on blue carbon, as discussed above. Here it would be crucial to ensure equal representation of natural and social sciences, as well as of researchers from the Global South and North, particularly in consideration of the significant equity issues in deep-sea science.[208]

Crucially, given the limitations in public participation within the UNFCCC, the proposed ocean-climate coalition should provide for wide contributions from civil society on the ocean, climate change and human rights perspectives, Indigenous peoples and local communities, and specifically support the participation of children and youth that have been very vocal internationally about the ocean-climate nexus.[209] In addition, different knowledge systems, including Indigenous and local knowledge, need to be included, as also called for by the BBNJ Agreement.[210] As discussed above, to date MSP continues to be

205 Unger (n 194).
206 *Ibid.*
207 *Ibid.*
208 This is discussed in Morgera *et al.* (n 74).
209 See Shields *et al.* (n 186).
210 BBNJ Agreement (n 198), Articles 7(j)–(k) and 13.

limited in regard to knowledge integration and knowledge inclusion.[211] What is therefore needed is careful consideration of how Indigenous and local knowledge systems can inform these processes from the start and throughout with Indigenous and local knowledge holders in committees, working groups and expert panels.

Another aspect relevant also for ocean-based climate action is that the Climate and Clean Air Coalition is not just about climate change, but rather emphasises the multiple benefits (air quality, health, food security, human well-being, and overall progress in sustainable development),[212] which have been articulated in harmonised policies, thereby allowing for diverse political interests to be pursued.[213] Notably, the Coalition provides opportunities to address (and fund) progress in both policy and science at the nexus of air quality and climate change.[214] This could provide a helpful approach to enhancing further synergies across the ocean-climate nexus; for instance, with regard to the implementation of the future plastics treaty.[215]

Overall, the Climate and Clean Air Coalition has succeeded in terms of capacity-building, and methodology improvement and the development of national laws, and complements the UNFCCC in that it raises capacities to increase and implement mitigation targets under the Paris Agreement. Additionally, the Coalition has served as 'a broker or an intermediary to help countries access funding from third parties, such as the Green Climate Fund or the German International Climate Initiative'.[216] This has included supporting national planning processes and NDCs, and is concomitant with the above reflections on the emerging potential of linking NDCs and MSP. The proposed ocean-climate coalition could undertake an analysis of international climate finance and ODA flows that can support a country-led prioritisation of ocean-based climate actions, rather than reflecting exogenous and narrower development partner interests.[217]

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211 See M Gilek *et al.*, 'In search of social sustainability in marine spatial planning: a review of scientific literature published 2005–2020' (2021) 208 *Ocean & Coastal Management* 105618; N Rivers *et al.*, 'Pathways to integrate Indigenous and local knowledge in ocean governance processes: Lessons from the Algoa Bay Project, South Africa' (2023) 9 *Frontiers in Marine Science* 1–17.

212 C Mewes and C Unger, 'Learning by doing: Co-benefits drive national plans for climate and air quality governance' (2021) 12(9) *Atmosphere* 1184–1198.

213 Unger (n 194).

214 *Ibid.*

215 See N O'Meara, 'Human rights and the global plastics treaty to protect health, ocean ecosystems and our climate' (2023) 38(3) *IJMCL*, this issue.

216 Unger (n 194).

217 JM Hills *et al.*, 'The disjuncture between regional ocean priorities and development assistance in the South Pacific' (2018) 107 *Marine Policy* 1–7.

Overall, coalition arrangements such as the above can be productive mechanisms to building awareness of the opportunities of ocean-based climate action, as well as developing biodiversity and human rights safeguards, thereby assisting in the preparation of new policy and legislative shifts at national and international levels. Such coordinated arrangements between State and non-State actors that work outside formal UN processes, but include them in their networks, complement and at times fast-track UNFCCC objectives.[218] Fundamentally, however, if ocean-based climate actions are to ensure that human rights implications are confronted and mitigated against, extreme caution needs to be exercised against creating decision-making processes that reproduce existing power hierarchies and exclusion.[219] The High-Level Advisory Board on Effective Multilateralism thus recommended strengthening UNEP and the UN Environment Assembly with a mandate to regulate the private sector, which continues to be driven by 'profit-motivated exploitation of natural resources'.[220] In addition, the Board urged 'mov[ing] beyond the mahogany table where a small number of powerful actors can dictate terms to the rest of the world' and 'evolve into a less hierarchical, more networked system where decision-making is distributed, where the efforts of a large number of different actors are harnessed, and where the collective mission is driven by delivery for people and planet'.[221] The proposed ocean-climate coalition should indeed nurture systemic changes that protect the world's marine ecosystems and the people who most depend on them, by devising genuine learning from Indigenous and local knowledge systems, as well as the distinct knowledge of women and children.[222]

Conclusion

There is an urgent need to enhance efforts to protect the marine environment from the negative impacts of climate change, and prevent further negative human rights impacts on ocean-dependent communities and everyone's human right to a healthy environment. Despite the international scientific

218 C Unger, KA Mar and K Gürtler, 'A club's contribution to global climate governance: The case of the Climate and Clean Air Coalition' (2020) 6(1) *Palgrave Communications* 99–109; C Unger and S Thielges 'Preparing the playing field: Climate club governance of the G20, Climate and Clean Air Coalition, and Under2 Coalition' (2021) 167(3–4) *Climatic Change* 41–62.

219 High-Level Advisory Board on Effective Multilateralism (n 191).

220 *Ibid*., at p. 28.

221 *Ibid*., at p. 61.

222 Shields *et al.* (n 186).

recognition of climate change-related risks for ocean health since the birth of the international climate change regime, ocean-based climate action has been only mentioned, but not operationalised, in the past two (or rather, thirty) years. And the role of the ocean in having already contributed significantly to climate change mitigation remains virtually unaccounted in the context of climate finance. Drawing on the REDD+ approach,[223] it has been possible to transcend uncertainties in carbon accounting and integrating other ecosystem services as co-benefits, integrating mitigation and adaptation, and seeking to ensure protection of biodiversity and human rights.

That said, growing discontent with the dominant approaches and limited public participation in the international climate change regime could be overcome by an alternative, multi-actor partnership approach that can draw on the experience of the Climate and Clean Air Coalition. Notably, the latter developed a partnership to address a mitigation topic that had not yet been addressed by the UNFCCC and mobilised synergies across the UN system, while supporting States that were taking early action at the national level. It is essential, however, that such an alternative governance approach is genuinely inclusive of different knowledge systems and fully informed by human rights standards, substantively and procedurally. These governance innovations can allow for a shift towards supporting a more integrated and inclusive development of NDCs and MSP that serve to co-identify ocean, human rights-based climate action that prevents further marine pollution and protects fragile ecosystems to the benefit of everyone's human right to a healthy environment.

223 Maniatis *et al.* (n 164); see also UN-REDD Programme, 'Our impact' available at https://www.un-redd.org/about/our-impact.